



**The University of Maryland  
Eastern Shore**  
*Graduate Catalog 2015-2017*



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# DISCLAIMER

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The provisions of this publication are not to be regarded as an irrevocable contract between the student and the University of Maryland Eastern Shore. At the time of publication, every reasonable effort was made to attain factual accuracy in the material presented.

This Catalog is not intended to be a complete statement of all procedures, processes and regulations governing graduate or professional degree programs which may be covered in separate program and office manuals and handbooks.

The University of Maryland Eastern Shore reserves the right to make changes in fees, course offerings and general regulations and academic requirements without prior notice.

All effort has been made to ensure that the information in this Catalog is current and accurate. However, policies, procedures, fees, forms and other information are subject to change after publication.

For the most up-to-date information on course offerings, program requirements, fees and deadlines, please write, call, email or visit the website of the program or department to which you are applying.

## **UMES Graduate Studies Contact Information**

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# THE UNIVERSITY

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## **The UMES Mission**

The University of Maryland Eastern Shore (UMES) is an undergraduate and graduate degree granting, research/teaching university on Maryland's Eastern Shore, and the 1890 Land Grant institution for the State of Maryland. UMES is a growing, primarily residential university with a teaching, research and extension mission consistent with its legacy as an 1890 Historically Black Land Grant institution. UMES emphasizes its commitment to equal educational opportunity, and strives to provide educational, research and public service programs to the state and region.

## **The Academic Program**

The University of Maryland Eastern Shore is one of eleven degree-granting campuses of the University System of Maryland. It was founded in 1886 as the Delaware Conference Academy under control of the Methodist Church.

UMES offers major programs leading to baccalaureate degrees in 26 disciplines in the arts and sciences, professional studies and agricultural sciences. UMES has 13 teaching degree programs and two pre-professional programs, as well as an Honors Program designed to prepare students for study in professional schools.

UMES also offers graduate degrees as follows:

### **School of Agriculture and Natural Sciences**

#### *Department of Agriculture and Human Ecology*

- ☐ Master of Science (M.S): Food and Agriculture Sciences
- ☐ Doctor of Philosophy (Ph.D.): Food Science and Technology

#### *Department of Natural Sciences*

- ☐ Master of Science (M.S): Chemistry
- ☐ Master of Science (M.S): Marine-Estuarine-Environmental Sciences
- ☐ Doctor of Philosophy (Ph.D.): Marine-Estuarine-Environmental Sciences
- ☐ Quantitative Fisheries and Resource Economics (Professional Science Master's Degree)
- ☐ Master of Science (M.S): Toxicology
- ☐ Doctor of Philosophy (Ph.D.): Toxicology

### **School of the Arts and Professions**

#### *Department of Criminal Justice*

- ☐ Master of Science (M.S): Criminology and Criminal Justice

#### *Department of Education*

- ☐ Master of Arts in Teaching (M.A.T)
- ☐ Master of Education (M.Ed.): Counselor Education
- ☐ Master of Education (M.Ed.): Special Education
- ☐ Doctor of Education Leadership (Ed.D.)

*Department of Social Sciences*

- ☐ Doctor of Philosophy (Ph.D.): Organizational Leadership

**School of Business and Technology**

*Department of Mathematics and Computer Science*

- ☐ Master of Science (M.S): Applied Computer Science

*Department of Technology*

- ☐ Master of Education (M.Ed.): Career and Technology Education

**School of Pharmacy and Health Professions**

*Department of Physical Therapy*

- ☐ Doctor of Physical Therapy (D.P.T)

*Department of Physician Assistant*

- ☐ Master of Medical Science (M.M.S.)

*Department of Rehabilitation*

- ☐ Master of Science (M.S): Rehabilitation Counseling

**School of Pharmacy**

- ☐ Master of Science (M.S): Pharmaceutical Sciences
- ☐ Doctor of Philosophy (Ph.D.): Pharmaceutical Sciences
- ☐ Doctor of Pharmacy (Pharm.D.)

## THE CAMPUS AND ENVIRONMENT

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Located in the small, historic town of Princess Anne on the Eastern Shore of Maryland, UMES is located on 745 acres of land with 90 buildings. UMES offers suitable facilities for its graduate programs including well-equipped, state-of-the-art laboratories and instrumentation, computing and telecommunications and networking capabilities, and resource centers.

Behind the East Campus are about 300 acres of farmland where innovative agriculture, environmental, and aquaculture research – serving both local and global economies – is conducted by several institutes, centers and programs.

Programs in the marine, estuarine and environmental sciences and in the agricultural sciences also benefit from the Eastern Shore of Maryland as a field laboratory with its diverse natural resources: the land, the ecosystem of the Chesapeake Bay estuary and the Atlantic Coast, state forests and parks, and a National Seashore (at Assateague Island). There is easy access to outdoor recreation opportunities such as camping, fishing and water sports. Within a several hour drive are the resources of Maryland's Western Shore and the federal sector located in the Washington, D.C.-Baltimore- Northern Virginia corridor.

The UMES graduate programs in quantitative fisheries, education, computer science, physical therapy, criminology & criminal justice and rehabilitation counseling serve and address community and regional needs for professionals and technical specialists.

The international dimension of the UMES campus can be evidenced by the flags of over 50 nations that fly, on a rotational basis, at the campus entrance. These flags are a reminder of the various nationalities of students enrolled at UMES.

# **GRADUATE STUDIES GENERAL INFORMATION**

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The University of Maryland Eastern Shore's Graduate School believes that it can best serve societal needs and respond to the challenges of graduate education through its commitment to time-honored principles. Accordingly, the major role of the UMES Graduate School is to provide for the education of students in the scholarly methods of intellectual inquiry and critical analysis; to train them in the discipline and skill necessary for beneficial research, applications and practice; and to foster in them a dedication to creative thought and the search for knowledge. The UMES Graduate School promotes the freedom and intellectual environment necessary to stimulate research and scholarship of the highest quality for both students and faculty.

In terms of governance, each campus of the University System of Maryland is administered by a President who is responsible for all academic programs. The delegated administration of the graduate programs at UMES, within the office of the Vice President for Academic Affairs, is to the Graduate Studies Dean. A Graduate Faculty Assembly and Graduate Council on the campus provide the organization by which the Graduate Faculty discharges its responsibilities for the quality and scope of graduate studies and research, embodied within the Graduate School.

The Graduate Studies website ([www.umes.edu/grad](http://www.umes.edu/grad)) provides information for prospective, new, current and international students, including details on graduate programs. There are also links to online application forms for admission, catalogs and handbooks, and information on scholarships, grants and loans.

## **Governance**

### **The Graduate Faculty**

The Assembly of the Graduate Faculty consists of all regular and associate members of the Graduate Faculty who, through their participation in research and graduate instruction, have displayed a capacity for individual research or creative and scholarly work at the highest levels.

The Graduate Faculty, working through the Assembly and the Graduate Council, establishes policies governing admission to graduate study and the minimum requirements to be met by all students seeking advanced degrees awarded by the Graduate Faculty at the University of Maryland Eastern Shore. The faculty of the various departmental graduate programs may set additional requirements, which are beyond the minimum established by the Graduate Council, for the admission to specific programs or for the completion of degrees within those programs.

### **The Graduate Council**

The Graduate Council consists of members of the Graduate Faculty elected by the Assembly, as well as appointed and ex-officio members. It is charged with the formulation of policies and procedures for the graduate programs at UMES. These include, but are not limited to, admission standards, review of new graduate programs and courses, and review of the UMES Graduate Faculty membership.



## Graduate Students

Students' opinion and participation in determining matters of policy, procedure, and administration are appreciated and encouraged. In addition to their election to the Graduate Council, graduate students may also serve on departmental and campus committees.

## National/Regional Organizations

The University of Maryland Eastern Shore maintains membership in national organizations such as the Council of Graduate Schools and the National Association of State Universities and Land Grant Colleges.

## **Accreditation**

The University of Maryland Eastern Shore is accredited by the Middle States Commission on Higher Education. UMES has professional accreditation for the graduate programs in Physical Therapy, Rehabilitation Counseling and Teacher Education (Career and Technology Education, Guidance and Counseling, Special Education and 11 content areas for the Master of Arts in Teaching). Three other graduate programs have selected an accreditation agency.

# ADMISSION TO GRADUATE SCHOOL

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## General

Responsibility for admitting applicants to graduate programs rests with the Dean of the Graduate Studies in consort with the advice of the departmental Program Coordinators and Graduate Admission Committees for each graduate program. Standards applied by the UMES Graduate School and the departmental programs are to ensure that students admitted are highly qualified and have a reasonable expectation of successfully completing a graduate program. In order to maintain programs of outstanding quality, the number of spaces in each program may be limited by the availability of faculty, and departmental and campus resources. In addition, there is a 30% ceiling on out-of-state (including international) admissions and enrollment.

Graduate credit for courses will not be given unless students have been admitted to the UMES Graduate School or have its consent if a UMES senior, according to the pertinent policy set in the Graduate School Catalog.

## Criteria for Admission (Master's and Doctoral)

Those who have earned or will earn a Bachelor's or Master's degree at a regionally accredited college or university in the United States or the US credit hours equivalent of a Bachelor's or Master's degree from another country, will be considered for admission to the UMES Graduate School. A *"regionally accredited college or university"* refers to accreditation by one of the six regional accrediting associations in the US recognized by the US Department of Education.

Students may apply for admission to UMES during or after their final year of undergraduate or graduate study, but must furnish proof of degree award before the end of their first term of enrollment at UMES. Students applying for admission to a Master's or Doctoral degree program in a field of specialization in which they already hold a Master's or Doctoral degree or its equivalent, may do so only if the previous degree program was of a substantially different character or was not accredited by a regional association.

Admission is open to non-US citizens (permanent residents, immigrants or non-immigrants). There is no separate application process for these applicants.

The decision to admit an applicant to a program is based primarily on a combination of the following criteria, which are consistent with requirements of the specific graduate programs:

1. **The quality of previous undergraduate and, as applicable, graduate work:** The UMES Graduate School requires as a minimum standard, a "B" average or 3.0 cumulative Grade Point Average (GPA) on a 4.0 scale, in a program of study resulting in the award of a baccalaureate degree from a regionally accredited US college or university, or the US credit hours equivalent of a Bachelor's degree from another country. Graduate Admissions Committees look closely at courses studied and grades earned in the major area of study. The student's undergraduate program should include completion of any prerequisites for graduate study in the chosen field. In individual programs where resources are available, applicants who do not meet the above minimum standard for their undergraduate work, may be provisionally-admitted if there is evidence, on the basis of other criteria, of a reasonable likelihood of success in the program the applicant desires to enter.

Doctoral program applicants will also submit Master's program transcripts.

2. **Strength of letters of evaluation (recommendation):** Three letters of evaluation are required from persons competent to judge the applicant's probable success in graduate school. Usually, these letters are from the applicant's former instructors who are able to give an in-depth evaluation of the applicant's strengths and weaknesses with respect to academic work. For applicants who have been out of school for a number of years, evaluations may come from employers or supervisors who are familiar with the applicant's work experience and strengths and weaknesses. Applicants should request their references to send the letters of evaluation directly to the Graduate School.
3. **Scores on a nationally standardized examination (as may be required by a program):** Because the predictive utility of these scores may vary from one group of applicants to another, a discriminating use of all relevant materials will be made in each applicant's case. The most widely used standardized examinations at UMES are the Graduate Record Examinations and the PRAXIS (formerly the National Teachers Examination).
4. **The Statement of Purpose:** The Statement of Purpose form is used by the applicant to explain why he/she wishes to pursue graduate study at UMES; and the applicant's career objectives and/or research interests which are pertinent to the intended program of study. The Statement of Purpose helps the specific graduate program to identify applicants whose purposes are compatible with the objectives of the graduate program.
5. **Other evidence of preparation:** Individual programs may require a personal interview, a writing sample essay or evidence of prior work experience in the field of study.

### Policy on Applicant Rejection

UMES may review a number of different factors to determine whether to admit an applicant to a graduate program, including but not limited to academic achievement, personal and professional references, scores on admission examinations, writing samples, personal interviews, character and integrity, personality, and potential to perform as a graduate student and as applicable to a profession. Applicants should consider licensing/registration/credential requirements of a profession in which past personal history or conviction/criminal record may restrict completion of a degree program (the professional phase) and the eligibility to practice in a profession if graduated from a program.

### Graduate Record Examinations (GRE)

Although not all graduate programs at UMES require the GRE, almost all will use such test scores as an additional measure of an applicant's qualifications. The GRE may be taken in either or both of two forms: the General Test, and the Subject Test. Applicants can take the test(s) in their senior year or when submitting the application for admission. Note that some programs may require the GRE test scores prior to an admissions decision.

For details on registering for the tests, applicants should visit the Educational Testing Service's website at [www.ets.org/gre](http://www.ets.org/gre).

**The UMES institutional code for the GRE is 5400.**

GRE scores should be at least at the 50th percentile for the verbal reasoning and quantitative reasoning, and at least a 4.0 in the analytical writing section.

Applicants should take the Subject Test package appropriate for the program to which they are seeking admission.

For information on the UMES graduate programs requiring the GRE, consult the specific graduate program in this Catalog.

Official test scores should be sent directly to the Graduate School.

Photocopies of test score results are acceptable for initial review, but not for Regular Admission status should the test score(s) be required by the program.

### Categories of Admission to Degree Programs

☐ Regular or Full Graduate Status

For admission to this category, an applicant must have received a baccalaureate degree and, if applicable, a Master's degree, from a regionally accredited institution (defined above in *Criteria for Admission* - Pg. 17) or the US equivalent of a bachelor's and/or Master's degree in another country, and be otherwise fully qualified in the judgment of the individual program and the Graduate School.

☐ Provisional Graduate Status

This designation may be used by the graduate program:

1. when quality of the previous academic record at a regionally-accredited institution in the US or abroad is lower than established standards (see *Criteria for Admission* section above, item 1.) or when there is a lack of adequate prerequisite course work in the chosen field;
2. when applicants have majored in another program area with a creditable record but there is some doubt about their ability to pursue the chosen program of study;
3. when the applicant is engaged in undergraduate or graduate study at another institution but is not able to furnish a transcript indicating completion of course work or degree requirements; or
4. when the applicant has completed a baccalaureate or Master's degree but has not yet submitted official verification of the last semester's work and receipt of the degree.

Final official transcripts indicating receipt of the degree must be submitted before the end of the first semester of enrollment at UMES.

Conditions to correct any deficiencies in preparation for graduate study at UMES will be outlined by the faculty. Full-time matriculated students are expected to remove condition(s) for provisional admission within the time period stated on the admission recommendation form, normally within the first year of matriculation depending upon the program (e.g., the first two consecutive semesters which might include the adjacent summer). Part-time matriculated students are expected to remove condition(s) of provisional admission no later than the end of the second year of matriculation (the fourth semester which might include the adjacent summer, depending on the program).

When all conditions have been met, the program may recommend admission of the student to full or regular status. This statement also applies to any conditions set by the Graduate

School (e.g., degree award, final/original transcript, etc.). Regular status is required to obtain the degree. Students who are unable to qualify for full admission under the conditions specified (e.g., by failure to fulfill them) will have their admission terminated.

#### ☐ Advanced Special Student Status

The Advanced Special Student Status is designed for individuals who do not have an immediate degree objective in mind, but wish to take graduate level courses for personal or professional enrichment. Although the primary mission of the UMES Graduate School is to conduct programs of graduate instruction leading to advanced degrees, the Graduate Faculty welcomes, to the extent that resources allow, qualified students who have no degree objectives. Unofficial transcripts or photocopies of degrees will be accepted with the application for evaluation purposes, but by the end of the first semester of enrollment, the student must submit official copies of all required documents. Official transcripts must be submitted from all institutions attended except for the University of Maryland Eastern Shore; the Graduate Studies office obtains the UMES transcript. Since Advanced Special Students enroll in the same classes as degree-seeking students and are subject to the same course prerequisites, standards for admission to this status cannot be lower than what the degree programs would allow for regular or provisional admission.

Applicants for admission to Advanced Special Student Status must hold a baccalaureate degree and satisfy at least *one* of the following criteria:

1. Hold a baccalaureate degree from a US regionally accredited institution or the US credit hours equivalent of this degree from another country, with an overall "B" (3.0) average. Applicants must submit official transcripts covering all credits used in satisfying the baccalaureate degree requirements;
2. Hold a Master's or Doctoral degree from a regionally accredited institution, or the equivalent of these degrees from another country. Applicants must submit an official transcript showing the award of a Master's or Doctoral degree;
3. Hold a baccalaureate degree from a regionally accredited institution or the US credit hours equivalent of this degree from another country, a cumulative GPA of 2.75 and have successful post-baccalaureate work or professional experience. Applicants must submit an official transcript showing the award of the baccalaureate degree, and summarize their post-baccalaureate work or professional experience on that section of the application form or submit a resume;
4. Achieve a score which would place an applicant in the upper 50th percentile of appropriate national standardized aptitude examinations such as the GRE or Miller's Analogies Test.

Admission to Advanced Special Student Status is granted by the Dean of Graduate Studies for a period of five years. Advanced Special Students must meet course prerequisites and maintain a 2.5 cumulative grade point average. There are restrictions on graduate courses in which Advanced Special Students may not enroll (e.g., Physical Therapy, the MAT, and the Doctoral weekend programs). Heavy enrollment programs such as Applied Computer Science require that Advanced Special Students who will earn six credit hours in Applied Computer Science courses with a grade of B or better must apply to the graduate program in Applied Computer Science before taking any further courses in Applied Computer Science if they seek

that graduate program. Registration for Advanced Special Students Status in the Applied Computer Science program is restricted.

Advanced Special Students must pay all standard graduate fees. Students in this status are not part of any of the UMES graduate programs, and therefore are not eligible to hold any Graduate Assistantships or receive similar forms of financial aid. All other services, e.g., parking, library privileges, etc., are the same as those accorded to other graduate students.

Admission to Advanced Special Student Status is not intended to be used as a preparatory program for later admission to a Doctoral or Master's program. Only six credits earned while in this status may be applicable to a degree or certificate program at a later time, with the approval of the faculty in the desired program, if the student is subsequently accepted for a degree or certificate program. For consideration of admission to a degree or certificate program, a student must submit the application for degree program form and meet all admission requirements, including an overall grade point average of 2.75 among the graduate courses taken at UMES.

Because Advanced Special Student is a non-degree status, it is not allowable for international applicants on a F-1 (student) visa. Advanced Special Student Status is allowable for F-2 visa holders (dependents) and may be allowable in some instances for other visa holders (e.g., H-1).

The application deadline for consideration of Advanced Special Student Status is no later than ten (10) school days prior to the registration date set for each semester or session.

☐ Visiting Graduate Student Status

A graduate student matriculated in another graduate school and who wishes to enroll in the UMES Graduate School but intends, thereafter, to return to the graduate school in which he/she is matriculated, may be admitted as a Visiting Graduate Student. (NOTE: This section does not apply to graduate students matriculated within the University System of Maryland campuses, who should follow the provisions given in a later section on the *Inter-Campus Enrollment*; however, inter-institutional enrollment for Salisbury University and UMES students follows the section below on "*Collaborative Programs with Salisbury University*".)

Criteria for enrollment as a Visiting Graduate Student are admission to and good academic standing in another recognized graduate school. The applicant need not submit full transcripts of credits, but must apply for admission to the UMES Graduate School (the application form for non-degree) and pay the application fee. In lieu of transcripts, a student may have his/her graduate administrator certify in writing to the UMES Graduate School that the student is in good standing and that the credits to be earned at UMES will be accepted toward the graduate degree at the home institution. Unless otherwise specified, admission to this status will be offered for one year only.

The application deadline for consideration under this status is one month prior to the registration date set for each semester or session for full-time study, and ten (10) school days for part-time study.

☐ Golden Identification Card for Senior Citizens of Maryland

The purpose of this identification is to make available, without charge, courses and services of the University to citizens who are 60 years of age or older, who are residents of the State of

Maryland and who are retired (retired persons will be considered those who affirm that they are not engaged in gainful employment for more than 20 hours per week). Persons who meet these requirements may apply for graduate admission, either as degree or non-degree students, and must meet the same admissions criteria pertaining to either category as do all applicants. Once admitted and having been issued the Golden Identification Card, these persons may register for courses in any semester/session, subject to the same restrictions as any other student, and use the library and other campus facilities during the time they are enrolled in courses. Tuition and fees charges will be waived for holders of the Golden Identification Card. See latest release of the UMES application for Graduate Admission package , for more information on this section on this program.

☐ Non-degree Student Status - Undergraduate

This is an undergraduate classification. It may be assigned by the Director of Admissions (Undergraduate Division) to those applicants who have received the baccalaureate or an advanced degree from a regionally-accredited institution but who do not desire, or who do not qualify for graduate admission. Non-degree seeking students who do not have a baccalaureate degree must submit transcripts and meet regular admission standards. Transcripts are not required from students with baccalaureate degrees.

Application for "Non-degree Student Status--Undergraduate" (Special Student) must be made directly to the Office of Admissions, not to the Graduate School.

The student is advised that no credit earned while in a "Non-degree Student Status-Undergraduate" may be applied at a later date to a graduate degree program at UMES.

### Collaborative Programs with Salisbury University

Students matriculated into a graduate program at either Salisbury University (SU) or UMES or for the joint Master of Arts in Teaching Program, follow the modified procedures for the Visiting Graduate Student Status to enroll in classes at either institution. Students use the inter-institutional concurrent enrollment process for any eligible semester or session class taken with the host institution.

### Offer of Admission and Deferments

A written offer of admission is made by the Graduate School to all accepted applicants and specifies the date of entrance (semester or session). The offer of admission also permits the applicant to register for courses. Graduate credit for courses taken at UMES will not be given unless students have been admitted to the UMES Graduate School.

Individuals whose original offers of admission have lapsed, or lapsed after one requested deferment of the date of entrance (up to a 12-month period), must submit a new application and fee if they want to be reconsidered for admission at a later date.

Applicants who are unsuccessful in gaining admission to a graduate program are notified in writing, usually by the program. The Graduate School informs non-degree applicants who are unsuccessful in gaining admission.

A student can be admitted to only one graduate program at any one time. There are no dual degree programs at the graduate level. Applications may be sent to more than one graduate program for review, but only one offer of admission to one degree program will be granted.

## Admission Time Limits for Degree Programs

Applicants admitted to a Master's degree program must complete all program requirements within a five-year period of the date of entrance specified in the offer of admission or deferred admission. Applicants admitted to a Doctoral degree program (traditional or accelerated and intensive) must be admitted to candidacy status within five years of the date of entrance specified in the offer of admission, after which another four-year period is permitted for the completion of the remaining requirements.

## Change of Degree-Level, Program or Status

Students are admitted only to a specified program and within that program only for the specified objective (e.g., Master's or Doctoral degree). If matriculated students wish to change either the program or their non-program status (for example, from Advanced Special Student to degree status), they must submit a new appropriate application along with the Change of Degree Program form if applicable and provide any other form or information as specified. Admission to the new program and/or status is not granted automatically.

Students must be re-admitted when the original objective has been attained. For example, when a student who is admitted for the Master's degree completes the requirements for that degree, if the student wishes to continue for the Doctorate, a new application for admission to the Doctoral program must be submitted. However, programs which offer both the M.S. and the Ph.D. degrees may consider qualified baccalaureate students for a probationary period before full admission into the Doctoral degree program. Their requests for admission to the Doctoral program are subject to the same review process applied to others seeking admission to that program.

## Termination of Admission (Time Limits; Grades; Academic Probation & Dismissal; Academic Suspension)

A student's admission terminates:

- a. when time limits for the completion of degree or non-degree status expire;
- b. if the student is no longer in good academic standing with an academic dismissal;
- c. with voluntary withdrawal from a graduate program;
- d. with the failure to meet Provisional Admission conditions, and
- e. with the intent to defraud, among other actions.

To be in good academic standing, degree seeking students must maintain a grade point average of 3.0 ('B') or better in all graduate courses taken for credit toward a degree program at UMES, and must also satisfy all additional requirements of the Graduate School and the specific graduate program. This makes them eligible to re-enroll each semester/session without restriction.

For most programs, graduate students who receive academic probation notices from the Graduate School must comply with the following requirement in order to retain their admission status at UMES. They have two consecutive semesters in which to bring their cumulative grade point average back to 3.0 ("B") after it falls below that level. Summer is an academic semester for programs with a required nine or more credit hour curriculum over the summer period. Some graduate programs may stipulate additional or more stringent academic probation and dismissal criteria (also see section on *Grades for Graduate Students* - Pg 42).



Academic suspension temporarily interrupts a student's continued enrollment for a specific time period, but allows the student to return to his/her admitted status. Academic dismissal is a termination of admission. It may be a permanent separation, or, if a graduate program allows, a separation for a time period, removed only by review by the program and acceptance of the case for reinstatement. Reinstatement involves special conditions to be met by the returning student.

The admission of all students, both degree and non-degree, is continued at the discretion, as applicable, of the Academic Advisor or Committee, the department Chair, the Program Coordinator and the Graduate School.

### Readmission/Reinstatement Process

The Graduate School form *Application for Readmission or Reinstatement* contains information on the process of seeking readmission or reinstatement. The student completes the front and back of the form, provides any additional materials needed and submits all to the graduate program for review and recommendation to the Graduate School for final action on acceptance or denial of the request.

### Policy on Dismissal for Non-Academic Reasons

UMES reserves the right to dismiss or refuse to graduate any student who does not maintain standards of academic and professional integrity, ethics, and conduct appropriate to the discipline/degree program during the student's course of study at the University, including clinical experiences, practica, and internships.

### Admission of Faculty

No member of the faculty employed by UMES with the rank of Assistant Professor or above is permitted to enroll in a graduate program leading to an advanced degree offered in his/her academic school. A faculty member who wishes to take course work for personal enrichment in his/her academic school may choose the Advanced Special Student status. A faculty member with rank of Assistant Professor or above who wishes to pursue an advanced degree (e.g. Doctorate) in a UMES graduate program outside of his/her academic school may do so by obtaining written permission from the Graduate School, subsequent to obtaining written consent from the Deans of both the academic school in which he/she is employed and that which he/ she seeks a degree.

Departments employing faculty below the rank of Assistant Professor must monitor and seek to avoid possible conflict of interest situations in cases of faculty appointments which will involve a dual role, as a teacher/researcher in the department and a matriculated graduate student in an advanced degree program housed in the department to which the faculty member is attached.

# APPLICATION INSTRUCTIONS

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## Application Forms and Materials

For a copy of the application for graduate admission booklet, write, call or e-mail the Graduate School, or visit the Graduate School's Prospective Students webpage ([www.umes.edu/grad/](http://www.umes.edu/grad/)) for forms. Also read the section on *Important Application Information*. There are separate application forms for degree and non-degree status. Applicants should submit materials as instructed on each of application form. For further explanation of the graduate application and admissions process described in this Catalog, including summary checklists, refer to the *UMES Application for Graduate Admission* form(also available on the Graduate School webpage under Prospective Students - <http://www.umes.edu/WorkArea/showcontent.aspx?id=31828>).

There is also an online graduate application on the University System of Maryland's website ([www.acciaff.usmh.usmd.edu/gradapp/index.html](http://www.acciaff.usmh.usmd.edu/gradapp/index.html)).

The introductory narrative in the *UMES Application for Graduate Admissions Process and Checklist* ([www.umes.edu/Grad/Default.aspx?id=17610](http://www.umes.edu/Grad/Default.aspx?id=17610)) is also useful background information for those submitting the online application.

## The Initial Application Process

To apply for a degree program, applicants must send the following:

1. The completed application form along with a completed Statement of Purpose form. These two may be submitted in hard copy or online.
2. Official transcripts covering all credits earned or in progress at any post-secondary institution.
3. Letters of evaluation (recommendation).
4. All applicable forms and materials listed in the application package including resume; and test scores.

## Transcripts

Each applicant must submit official copies of all of his/her academic transcripts for undergraduate and graduate work taken to date, regardless of whether a degree was awarded. Each transcript should bear the signature of the registrar and the seal of the granting institution and should include the years of attendance, courses taken, grades received, and the degree, diploma or certificate conferred. For applicants who attended UMES, the UMES Graduate School may obtain the records for courses completed on this campus and the degree awarded. To facilitate the application process, an official copy of transcripts from all other institutions should be attached to the application.

Although photocopies of credentials or unofficial (student issued) transcript copies are acceptable for initial review, regular admission status cannot be granted, nor will any degree be awarded, until the UMES Graduate School has received official copies of all academic credentials certified by an administrative official of the school, college or university.

Holders of transcripts of post-secondary study and degrees earned outside the United States are subject to the information requested in the section on *Academic Credentials of International Applicants*.

## Calculation of Grade Point Average (GPA)

Applicants with degrees from US institutions or foreign institutions with a grading system comparable to the US, must be certain to calculate and convert their grade averages to a four-point (4.0) grading system, and at three levels, for credits included in the baccalaureate program, unless their transcripts already provide the GPA calculated data. See the instructions below for specifics on the calculation.

The Graduate School will determine an equivalent cumulative GPA for foreign applicants with educational systems different from the US.

The GPA levels are:

1. Overall.
2. Credits earned after the first 60 credits up to the date of application or the date of the award of the baccalaureate degree, whichever is later.
3. Those credits which constitute the major field.

For work taken beyond the bachelor's degree, a separate computation should be made.

All results are entered into the spaces provided for the GPA on the application form. All grades are to be calculated on a four-point grading system, shown below, regardless of the grading system used at the institution attended. Pass/fail, satisfactory/failure, completed credit and similar grades are not to be included in the calculations. All numerical, alphabetical or equivalent grades, except as already noted, must be calculated as follows:

1. Convert all hours to semester hours (one-quarter hour equals 2/3-semester hour or one-semester hour equals 1½ quarter hours).
2. Count the number of credit hours for each grade.
3. Multiply the total credits for each grade by the number of (quality or honor) points for each as follows: A = 4; B = 3; C = 2; D = 1; and F = 0 (intermediate marks, e.g., B+, C-, are assigned in the value of the letter grade, e.g., B+ = 3, C- = 2).
4. Then divide the total grade points by the total number of credits to obtain the GPA.

## Application Fee

A non-refundable application fee of US \$45 (Master's/non-degree) and US \$50 (Doctoral) must accompany each application. NOTE: the governing policy for, and any allowable waiver of the application fee, is found in the subsequent section on *Graduate Fees* (Pg. 32).

Payment should be made by check or money order payable to the University of Maryland Eastern Shore. The on-line application allows use of a credit card.

## Application Deadlines

It is the applicant's responsibility to check the individual program to which he/she is applying for any specific application deadline, including those for international applicants. Except for programs which have only one application deadline per year, all other programs have Fall, Spring or Summer deadline dates. If an applicant misses one of these deadlines, his/her application may be considered for the next available admissions cycle.

It is also to the applicant's advantage to be timely if he/she wishes to be considered for Graduate Assistantships (admission to a program is required) or other forms of financial

support. Applicants should consult the *Financial Assistance* section for application deadlines for federal financial support.

Non-degree program applicants (e.g., Advanced Special and Visiting Graduate Students) should submit applications according to the schedule given in those admissions sections.

Faculty who comprise the program Admissions Committees may not always be available over the summer months. Applicants for consideration of a Fall admission should note that if they do not meet the program's Fall application deadline or have their application complete by that deadline, they may not be admitted in a timely manner or may be deferred to a Spring admission.

If all completed degree program application materials, as requested, do not arrive simultaneously, the Graduate School, for internal processing purposes, desires the order of receipt to be the application and attachment forms, the official transcripts, standardized exam test scores and lastly, the letters of evaluation (recommendation). However, by the stated application deadline date, the application is **complete** only if **all** materials have been received. The graduate programs' Admissions Committees normally will not begin review of applications unless each application package is complete.

Refer to [www.umes.edu/Grad/Default.aspx?id=22806](http://www.umes.edu/Grad/Default.aspx?id=22806) for more information on deadlines.

### Termination of Application Process

Deliberate omission, misrepresentation or falsification of information on the application for degree or non-degree programs and accompanying application materials, and altered or fraudulent credentials (transcript, test score) will terminate the admission process for the applicant. If any of these problems surface after the applicant has been admitted, that student's enrollment status will be terminated.

### Status of Application

***All hardcopy print materials should be sent to:***

**The Graduate School,  
University of Maryland Eastern Shore,  
Princess Anne, Maryland 21853.**

Please note that applicants also have the option to apply online at [www.umes.edu/Grad/Default.aspx?id=17612](http://www.umes.edu/Grad/Default.aspx?id=17612).

Applicants are advised to carefully follow the instructions in the application package and to respond to all applicable requests for information. Some programs may have a supplemental information form or checklist to be completed and submitted with the application.

Incomplete application materials (i.e., insufficient information or responses), will delay the start of the admissions review process.

The Graduate School forwards all materials received to the appropriate Graduate Program Coordinator to start the application review process by the program's Admissions Committee. It is important, then, for applicants to arrange to have all application materials requested to arrive around the same time period in order to facilitate, rather than delay, the admissions

review process. The Graduate School and the Graduate Program involved jointly track the application materials received.

Applicants, however, are solely responsible for making certain that their transcripts, letters of evaluation/recommendation and any applicable application attachment forms have, in fact, been received. No follow-up action can be taken by the UMES Graduate School for missing, misdirected or incomplete items.

### **International Students Application Process**

International applicants seeking admission to the University of Maryland Eastern Shore should not plan to leave their country before receiving an official offer of admission from the Graduate School. The Graduate School undertakes a preliminary review and evaluation of the international applicant's materials (academic credentials and application completeness) prior to their admission to the graduate program.

### **Academic Credentials**

For foreign nationals, the completed application and fee, letters of evaluation and official academic credentials for all undergraduate and graduate (tertiary level) institutions attended/being attended, should all be received by the UMES Graduate School by the appropriate international deadline date (if given) or the specific program deadline date (if a fixed date).

Official transcripts must be submitted by the applicant to World Education Services (WES) for a course by course evaluation which must be received by the Graduate School at the time the application for admission to the graduate program is being reviewed. WES currently evaluates and authenticates credentials for submission to the Graduate School at UMES. As of January 20, 2010 WES has been officially recognized as the recipient of verified Chinese degrees for the U.S. and Canada. Foreign nationals should complete an application for transcript review at [www.wes.org](http://www.wes.org) and request that the registrar of the institution from which they obtained their degree send the original copy of the transcript to WES for evaluation. WES will submit the evaluation along with a certified copy of the transcript to UMES. Transcripts that do not indicate the degree earned will not be accepted by the Graduate School.

The name of the individual on the credentials must match that on the application.

Photocopies of credentials are acceptable for initial review purposes only. Official credentials (original documents) from non-US institutions must bear either an imprinted seal, an original stamp of the institution or the original signature of a school official.

Official documents should include the courses completed, the amount of time taken per course, grades and the grading system.

Public documents signed by a notary public are considered unofficial.

Official credentials must be received or certified by the Graduate School before regular (or full) admission status is granted. Students enrolled at another US institution may have certified copies of all foreign records sent directly to the UMES Graduate School by their current institution. Transcripts of their US coursework must be sent directly from the institution.

Only applicants who have completed a full sequence of preparatory studies and examinations equivalent to a US bachelor's (normally four years and 120 credit hours of study) or higher degree from an approved institution, and who have demonstrated high academic achievement, will be considered for admission.

## English Proficiency Testing

When applicants are ready to begin their studies, they will be expected to read, speak and write fluently in English, in order to understand lectures, take examinations and participate in seminars and presentations. Applicants should be aware that UMES does not offer any program of English for non-native speakers of English to improve their proficiency.

Native speakers of English are defined as those who have received all of their education in the United States, United Kingdom, English-speaking Canada, Ireland, Australia, New Zealand and Commonwealth Caribbean. International applicants who are non-native speakers of English (not their first language or the language of instruction at all levels of schooling) must demonstrate a proficiency in the English language by taking the Test of English as a Foreign Language (TOEFL) and scoring 79/80 (internet based test), 213 or better (computer based test), or by providing evidence of an equivalent official testing in the English language with an acceptable score. Graduate programs may request TOEFL scores of non-immigrant visa status holders and permanent resident applicants.

Possible exceptions may be made for non-native speakers who have successfully pursued full time academic work leading to a postsecondary degree or diploma in an English speaking country (see above), where English is the language of instruction. The TOEFL requirement is waived for an international student awarded a baccalaureate degree from UMES or a graduating senior at UMES who will have completed at least four years of undergraduate study at a US college or university.

Because TOEFL is given at selective times a year throughout various parts of the world, as soon as applicants contemplate study at UMES, they should make arrangements to take the test. For TOEFL test information, go to [www.ets.org/toefl](http://www.ets.org/toefl).

Standardized test scores are considered valid within a 24-month period of the examination. When requesting official TOEFL score reports to be sent to the Graduate School, please refer to the UMES institutional code: 5400. A copy of an applicant's "Examinee's Score Record" may be sent with the application for evaluation purposes only. (Note that the data on this record will be verified with ETS). The official score from ETS must be received for the applicant's permanent file. Applicants found to be deficient in English and required to improve their English proficiency do so at their own expense. Any course(s) or exams taken for this purpose will not count for degree credit.

## Financial Resources

To meet immigration requirements, each international applicant must furnish a completed *Certification of Finances* form to the Graduate School with the application, signed by him/her and the sponsor. Approximately US \$20,000 annually is an average for educational and living expenses. Evidence of funding (in US dollars) for the first year must be provided with an indication of how financial support will be provided for subsequent years (normally up to two years for a Master's program and up to three to four years for the Doctorate).

International students are ineligible for need-based federal and state financial aid programs.

International applicants may not refer to assistantships and campus employment as a source of financial support since a student must be admitted to the Graduate School before being eligible for these scarce financial resources. Applicants unable to demonstrate that they possess adequate financial self-support for their graduate study, including health insurance, will not be admitted.

The *Certification of Finances* form is to be updated and resubmitted if there is a request for deferment of the original admission since financial institution statements will be outdated.

### **Immigration Documents**

In order to obtain an F-1 student visa (for the purpose of pursuing full-time study), international applicants must complete Form I-20, issued by the UMES Office of Undergraduate Admissions. International applicants should not plan to leave their home country before obtaining an official offer of admission. International students already studying in the US, who wish to transfer to UMES, must provide copies of their I-20, I-94 and passport visa stamp to the Office of Undergraduate Admissions. The Department of Homeland Security is then requested to grant permission for the transfer. UMES handles only the F-1 student visa.

### **Reporting Upon Arrival**

Every admitted international graduate student is expected to report to the campus International Student Advisor as soon as possible after arrival at UMES. The Advisor will inform the student about campus and community services and assistance, which are available to international students.

### **Records Maintenance and Disposition**

All records, including academic records from other institutions, become part of the official file of the Graduate School and can neither be returned nor duplicated for any purpose. Students should maintain a copy of their official credentials for their personal use.

The official credentials and the applicants' data are retained for 18 months only and then destroyed in the following cases:

1. Applicants who do not register for courses in the term for which they were admitted and have not sought a deferment of the date of entrance.
2. Those whose applications have been disapproved.
3. Applicants who do not respond to the departmental graduate program and/or the Graduate School requests for additional information.
4. Those whose application folders remain incomplete, e.g., missing transcripts, recommendation letters, application forms, etc.

### **Fees and Other Expenses**

#### **Payment of Tuition and Other Fees**

It is the policy of UMES not to defer tuition fee payment on the basis of a pending application for financial assistance to an outside agency, including Veterans Administration benefits, bank loans, guaranteed student loan programs, etc.

Students whose accounts are in arrears will experience delays and holds in registration and in admittance to classes. Students indebted to the University are likewise prevented from having degrees conferred or transcripts released until the total debt is cleared.

The State of Maryland has a State Central Collections Unit, and in accordance with State law, UMES is required to refer all delinquent accounts to that office for collection and subsequent legal action.

### Withdrawal and Tuition Refund (Regular Semester/Session)

A Cancellation of Registration, submitted to the Undergraduate Admissions Office before the official first day of classes, entitles the student to a full credit or refund of semester/session tuition.

After classes begin, students who wish to terminate part or all of their registration must follow the drop class or withdrawal procedures of the Registrar and Academic Affairs. Students in the University System of Maryland intercampus enrollment must make certain they drop or withdraw at the host campus as well as at UMES. The effective date used in computing refunds is the date the drop and/or withdrawal form is filed.

Students dropping classes and/or withdrawing from the University during a semester will be credited for any allowable tuition charges, according to the following schedule:

Period from date instruction begins	Refundable Tuition only (not other fees)
Two weeks or less	80%
Between two and three weeks	60%
Between three and four weeks	40%
After four weeks	No Refund

*(This schedule is subject to change)*

### University Refund Statement (Regular Semester/Session)

Tuition is authorized for refund, according to a refund time schedule (see above), only if the student cancels registration before classes begin, or drops classes after classes begin, completes the prescribed procedures for withdrawal from classes for the semester, or is dismissed. Note that all of these conditions to be eligible for a tuition refund must be acted on during the refund schedule period.

### Weekend Programs

Weekend Programs follow a separate Graduate School policy for adding, dropping and withdrawing from classes and refund of tuition. Consult the program and the Graduate School.

**Graduate Fees**

The fees and charges listed herein are those charged at the time this Graduate School Catalog went to publication and are offered as a general guide. **THE UNIVERSITY RESERVES THE RIGHT TO MAKE SUCH CHANGES IN FEES AND OTHER CHARGES AS MAY BE NECESSARY.** The University's *Schedule of Fees & Expenses* is available on the UMES website at <http://www.umes.edu/About/Default.aspx?id=241>.



## Application Fee

US \$45 for Master's & US \$50 for Doctoral.

A non-refundable Application Fee and a separate application must be submitted for each program or degree-level or status in which entrance is sought.

UMES will waive the Application Fee under the following circumstances:

1. the applicant had been admitted, and had previously taken graduate courses at UMES or at SU (see section on Collaborative Programs with Salisbury University); or
2. the applicant is a UMES senior or graduate with a cumulative grade point average of 3.5 or better; or
3. the applicant is a senior or a graduate of an accredited US college or university, with a cumulative grade point average of 3.75 or better (confirmed by transcript); or
4. the applicant is a McNair student/Scholar (must be documented).

Graduate programs may require an acceptance fee, which is applied as a credit to tuition and other fees upon the student's initial enrollment in the degree program.

### Tuition Per Credit Hour Fee: (subject to change)

Resident Student	US \$307.00
Non-Resident Student	US \$548.00

Students admitted to the UMES Graduate School must pay the graduate tuition regardless of whether a course is audited or the credit earned will be used to satisfy program requirements. Graduate students will be charged for tuition at the graduate rate regardless of the numbering system of courses for which they register.

### Supplemental Fees (subject to change)

Registration Fee (campus) - Summer/Winter Session		\$5.00
Graduation Fee	Master's Degree	\$35.00
	Doctoral Degree	\$35.00
Student Activity Fee (on-campus)		\$30.00
Vehicle Registration/ Parking Fee		\$40.00
Off-Campus/Continuing Education Registration Fee		\$25.00
Technology Fee		\$10.00

## Determination of In-State Status for Admission, Tuition and Charge-Differential Purposes

An initial determination of Maryland residency status for admission, tuition and charge differential purposes will be made by UMES at the time a student's application for admission is under consideration. The determination made at that time, and any determination made thereafter, shall prevail in each semester/session until the determination is successfully petitioned and changed. A campus residency committee meets periodically to review petitions for reclassification to in-state status.

Persons who need assistance with the reclassification should contact the UMES Office of Undergraduate Admissions or the Graduate Studies office. The Board of Regents Residency Policy is on the Graduate School's webpage ([www.umes.edu/Grad/Default.aspx?id=17650](http://www.umes.edu/Grad/Default.aspx?id=17650)).

### **Financial Assistance**

The University of Maryland Eastern Shore recognizes the high cost of education and makes every effort to offer financial assistance to qualified students through a variety of programs. Admission to a graduate program (e.g., Provisional or Regular student status) is a prerequisite for consideration of an award of a teaching, research or administrative assigned assistantship, a traineeship, a grant, loan or a work-study award. Some awards are made on the basis of the applicant's academic merit and/or financial need, others on the basis of skill qualifications and other criteria. Once awarded, the continuation of most financial assistance is dependent upon the student's continued enrollment each term for a specified number of credit hours and continued good academic standing, among other factors.

The Graduate Studies office processes applications for the Graduate Studies Grant Award ([www.umes.edu/Education/Content.aspx?id=13366](http://www.umes.edu/Education/Content.aspx?id=13366)), the *Dr. Archie Buffkins Scholarship for Graduate Education* ([www.umes.edu/Grad/Default.aspx?id=17616](http://www.umes.edu/Grad/Default.aspx?id=17616)) and the *Conectiv Graduate Studies Endowed Scholarship* ([www.umes.edu/Grad/Default.aspx?id=17620](http://www.umes.edu/Grad/Default.aspx?id=17620)).

Individual faculty, the graduate programs and the academic departments recommend appointments for teaching and research assistantships. Some offices and departments may offer administrative-type assistantships. The graduate programs as well as academic departments and offices on campus should be consulted for available traineeships and part-time employment on sponsored grants and contracts.

The UMES Financial Aid Office ([www.umes.edu/financialaid/Default.aspx?id=18726](http://www.umes.edu/financialaid/Default.aspx?id=18726)) determines eligibility for financial aid programs that are primarily based on "need." Full and many part-time graduate students are eligible to apply for the Federal Stafford Student Loans. The Financial Aid Office also administers the Federal Unsubsidized Stafford Loan Program, which is not based on need. Students must complete all the required forms for need-based aid or the unsubsidized Stafford loan program.

The Financial Aid application process takes approximately four (4) weeks to receive the student aid report and three (3) weeks for award notification. Students should submit the required documents by March 1<sup>st</sup> in order to receive priority in the awarding process for the upcoming award year.

International students are not eligible for most types of financial assistance.

### **Graduate Studies Grant Award**

This grant is intended to promote diversity in the UMES graduate student population. The Scholarship is available for legal residents of Maryland whose have obtained regular admission and enrolled as full-time graduate students in a Master's or Doctoral degree program at the University. Applications and guidelines are available in the Graduate Studies office.

### **Fellowships and Traineeships**

Some faculty may obtain federally sponsored fellowships and traineeships for underrepresented minorities in the sciences. They should be consulted on availability and

applicability of this funding. Another general option for graduate students is the Henson Fellows. Contact the Office of Undergraduate Admissions for information.

### Assistantships

Recommendations for appointment of graduate teaching, research or administrative assistantships, which are made by the graduate programs, academic departments, campus offices or faculty, are contingent upon the applicant's acceptance and admission into a degree program. The number, level, and duration of assistantships vary by graduate program/department/office needs, enrollment, and the availability of institutional and sponsored funding. Applications for teaching and research assistantships will usually be made directly to the program/department in which the student is admitted. These Graduate Assistants are supervised and mentored at the department or program level. A smaller number of Assistantships (administrative assignment) may be available in selected campus offices. Information on campus policy and procedures concerning Graduate Assistants is found in the *Graduate Assistant Handbook* available on the Graduate Studies publications webpage at [www.umes.edu/Grad/Default.aspx?id=17594](http://www.umes.edu/Grad/Default.aspx?id=17594). The Graduate Studies office releases annually the assistantship stipend amounts for each succeeding academic year.

### Federal Loans

Perkins Loan Funds are available to graduate students after awards are made to undergraduate students. Loans are approved based upon financial need. Repayment begins six months after the borrower leaves school, and no interest is charged until the beginning of the repayment schedule. Repayment of the loan, including interest, is deferred during the time the borrower may be in military service, the Peace Corps, VISTA and ACTION, up to a period of three years, as well as during time of continued study on, at least, a half-time basis. For information and applications, contact the UMES Office of Financial Aid.

### Federal Stafford Student Loans

Stafford Student Loan programs permit students to borrow money from their hometown banks or other local financial institutions. Graduate students in good standing may borrow up to \$12,500 per year. An origination fee will be deducted from the face value of each student's loan. New borrowers will borrow at a variable rate that will be determined each year by the federal government. Monthly repayments begin six months after graduation or withdrawal from school. The federal government will pay the interest for eligible students while the student is in school. Contact the UMES Financial Aid office for details.

### Veterans Benefits

UMES is fully accredited for accepting Veteran students and assists them in their needs for certification. Credit is given for any work done in the military service related to their major field of study. The Certificate of Eligibility must be submitted to the Office of Undergraduate Admissions when the veteran reports for registration. Benefits to which the veteran is entitled will be sent monthly by the Veterans Administration and directly to the veteran after he/she has been properly certified. Each veteran is responsible for the payment of all fees and expenses at the same time as regular students. The Undergraduate Admissions Office coordinates veteran services. Veterans are advised to contact that office for further information on admissions, tutorials, and special programs.

# **REGISTRATION, CREDITS AND GRADES**

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## **Academic Schedule (Classes)**

Information concerning graduate class offerings by department, per semester or session, registration procedures, deadlines and the Academic calendar is found on the Academic Affairs website at [www.umes.edu/academic/](http://www.umes.edu/academic/).

## **Developing a Program of Study**

Each graduate student is responsible for understanding and complying with the rules and procedures of the UMES Graduate School and all applicable departmental graduate program requirements which govern individual programs of study.

Course selection for newly-admitted graduate students, whether degree or non-degree seeking, begins with a contact with each student's assigned Academic Advisor, usually a graduate faculty member in the departmental graduate program to which the student has been admitted.

Non-degree seeking students may have a graduate faculty or program coordinator as their Advisor while they are in this status.

Degree seeking students will obtain information from their Advisors about specific degree or certificate requirements, recommendations on courses, etc.

Some graduate programs have handbooks, manuals, or websites which explain degree program requirements, department resources and forms used in evaluating student progress to degree, applying for internships, etc.

Each degree-seeking student will develop with their Academic Advisor their program of study and timetable for completion.

## **Academic Advisor**

Upon admission to the Graduate School, students are assigned an Academic Advisor. This person will be responsible for advising on all aspects of the student's progress throughout the program. Any request for a change of advisor must be submitted to and be approved by the Program Director.

In certain situations, a student may want a second Academic Advisor. This might happen if, for instance, the professor most familiar with the student's work will have only an Associate Graduate Faculty status. In this case, it is possible to set up a Co-Advisor team of two professors who jointly serve in the role of Advisor (the other having Regular Graduate Faculty status).

## **Exceptions, Waivers, Appeals, Grievances**

While most questions and issues normally raised and met by graduate students will be answered or resolved by the faculty advisor or a departmental committee, the Graduate School is also charged with assisting graduate students who need additional information, guidance or follow-up assistance. Requests or petitions for exceptions or waivers of Graduate

School regulations or of graduate degree requirements, or appeals and grievances, with supporting materials, should be directed to the Graduate School for review and determination of applicable policy, procedure or process for the handling of the exception/waiver, appeal or grievance.

## Course Numbering System

<b>Number</b>	<b>Course Designations</b>
000-009	Non-Credit Courses
100-199	Primarily First-year undergraduate courses
200-299	Primarily Sophomore undergraduate courses
300-399	Junior and Senior courses not acceptable for credit toward graduate degrees
400-499	Junior and Senior courses acceptable for credit toward some graduate degrees
500-599	Professional School courses (Dentistry, Law and Medicine) and post-baccalaureate courses not for graduate degree credit. An exception is the joint UMES/SU Master of Arts in Teaching program.
600-898	Courses restricted to graduate students. Under certain conditions, seniors may take 600 lower level courses with prior approval.
799	Master's thesis credit
899	Doctoral dissertation credit

The first character of the numeric position determines the level of the course and the last two digits are used for course identification.

Courses ending with an 8 or 9 are courses that are repeatable for credit.

All non-repeatable courses end in 0 through 7.

## Designation of Full and Part-Time Graduate Students

In order to accurately reflect both involvement of graduate students in their programs of study/research and use of University resources in these programs, the UMES Graduate School employs graduate units. These graduate units, in turn, are utilized in making calculations to determine full- or part-time student status in the administration of minimum registration requirements described below, and in responding to student requests for certification of full-time student status.

The number of graduate units, per semester credit hour, is calculated in the following manner:

Courses in the series:	000-399 carry 2 units/credit hour.
Courses in the series:	400-499 carry 4 units/credit hour.
Courses in the series:	500-599 carry 5 units/credit hour.
Courses in the series:	600-898 carry 6 units/credit hour.
Research course:	799 carries 12 units/credit hour.
Research course:	899 carries 12 units/credit hour.

To be certified as a full-time graduate student, an individual must be officially registered for a combination of courses equivalent to 48 units per semester.

Graduate Assistants, holding full-time appointments, are full-time students if they are registered for at least 24 units, in addition to their Assistantship.

Courses taken for Audit do not generate graduate units and cannot be used in calculating full- or part-time status.

UMES reserves the right to alter this system.

### Continuous Enrollment

Graduate programs may require a continuous enrollment for admitted students into the program during each semester of the academic year and summer session until the student completes the degree requirements. The number of credit hours required per registration each semester or session may vary according to the course credit offerings and degree requirements of the program. In extenuating circumstances, students may petition for an official leave of absence from the program for up to one academic year (two semesters).

### Minimum Registration Requirements

All graduate students, at any level of study and research, making any demand upon academic or support services of the university – whether taking courses, using UMES facilities (e.g., library, laboratories, computers, office space, housing, etc.), consulting with faculty advisors, taking comprehensive examinations and oral defenses, etc. – must register for the number of graduate units which will, in a faculty advisor's judgment, accurately reflect a student's involvement with graduate study and use of university resources. In no case will registration be for less than one credit. Minimum registration may also be needed to comply with requirements for financial aid and deferments, visa status, campus housing, health and car insurance, etc.

### Minimum Registration Requirements for Doctoral Candidates

Doctoral students who have been advanced to candidacy must register each semester (see above section), until their degree is awarded. If the degree program is an accelerated one, the Summer session is also a semester.

### Dissertation Research

Those who have not completed the required number of credit hours of Dissertation Research (899) must register for a minimum of one credit of dissertation research each semester. Doctoral candidates whose demands upon the University are greater than that represented by a minimum registration, will be expected to register for the number of graduate credits which reflect their use of UMES resources.

### Inter-Campus Enrollment (USM)

A student admitted to a Graduate School on any campus of the University System of Maryland (USM), is eligible to take courses on any other USM campus with approval of both the Academic Advisor and administrators on the home as well as host campuses. Credits earned on a host campus are considered resident credits at the home campus in meeting degree

requirements. Transcripts of work taken at another campus will be maintained on the home campus, and fees will be paid to the home campus.

Forms for registration as an intercampus student may be obtained from the Registrar or Graduate School offices on any USM campus. Terms and conditions of USM intercampus enrollment are given on the reverse side of the USM form. Students are responsible to notify both the home and the host campus of intended changes in registration (add/drop, withdrawal, etc.) to avoid incorrect billings.

Inter-campus students anticipating enrollment in courses at UMES should have their forms received by the UMES Graduate School no later than ten (10) school days prior to the registration date set for each semester/session. The Inter-campus enrollment process may not be acceptable to all USM campuses during the Winter or Summer sessions as these sessions are self-supporting.

The UMES Policy on Graduate Student Concurrent Inter-Institutional Registration (1992) and the Board of Regents Policy Statement on the subject (1991) shall govern procedures and arrangements.

For more information, go to [www.umes.edu/Registrar/Content.aspx?id=2514](http://www.umes.edu/Registrar/Content.aspx?id=2514).

### Graduate Credit for Senior Undergraduates

A senior in the final semester at UMES, who is within six credit hours of completing all requirements for an undergraduate degree, has a 3.0 cumulative GPA and has completed any graduate course prerequisite with a grade of 'B', may, with approval of both the department/program offering the course (e.g., instructor, chair) and the Graduate School, register for a 600 level or below graduate course. The course(s) may later be counted for graduate credit toward an advanced degree at UMES if the student has been granted admission to the UMES Graduate School within an academic year of completing the course, and subject to the admitted program's approval in the student's plan of study.

The student's total of undergraduate and graduate courses must not exceed 15 credit hours for the semester and 6 credit hours for the Summer Session. Excess credits in the senior year cannot be used for graduate credit unless proper pre-arrangement is made. Seniors who wish to register for graduate credit should contact the UMES Graduate School for the form to be completed.

The maximum number of graduate credits that can be earned under this mechanism will be six. The credits earned can be used only once, either for the undergraduate degree or toward an advanced degree at UMES. Seniors who wish to take a graduate course for undergraduate credit should consult the subsection below.

### Undergraduate Credit for Graduate Level Courses

Subject to requirements and prior approval of the graduate program offering the course, undergraduate students may register for 600 level or below graduate level courses to receive undergraduate credit.

A student seeking to use this option must be in the senior year at UMES, should have earned an accumulated grade point average of 3.0, have successfully completed with a grade of "B"

or better any graduate course prerequisite, and be a major in the appropriate or a closely-related department.

Enrollment in a graduate level course for undergraduate credit does not, in any way, imply subsequent departmental or UMES Graduate School approval for admission into a graduate program, nor may the course(s) be used as credit for a graduate degree within the University System of Maryland.

### Credit by Examination (Graduate and Undergraduate)

A graduate student may obtain graduate credit by examination in courses (at the 400 or 500 level) previously identified for such credit by the appropriate department/program. As a general rule, credit by examination is not available for courses at the 600, 700 or 800 levels. In the judgment of the UMES Graduate Council, courses at these levels require a continuing interaction between faculty and student to achieve the educational goals of advanced study.

Students may receive graduate credit by examination only for courses for which they are otherwise eligible to receive graduate credit. The department or program in which the student is enrolled, may establish a limit on the number of graduate credits earned in this manner. Graduate students seeking credit by examination for graduate credit or for prerequisite undergraduate courses (100-300 series), must obtain the consent of their Advisor, the instructor currently responsible for the course, and the Graduate School. Once each student begins the examination, the grade earned will be recorded. The fee for credit by examination is set per course regardless of the number of credits or units to be earned (subject to change). The Credit by Examination form is available in the Registrar's office.

### Transfer of Credit

A maximum of six semester hours of graduate level course credits, earned at regionally-accredited institutions (see definition, above under *Criteria for Admission* – Pg. 17) prior to, or after admission and enrollment at UMES, may be applied toward Master's degree programs. Proportionately, larger amounts of credit may be applied toward Doctoral degrees. See the section on *Inter-Campus Enrollment (USM)* for treatment of course credits within the University System of Maryland campuses.

Credit from foreign universities will be evaluated, but, because of academic and procedural differences between foreign and US regionally accredited institutions, may not in every case be acceptable for transfer on a *quid pro quo* basis.

All graduate study credits offered as transfer credit must meet the following criteria:

1. They must have received graduate credit at the institution where earned.
2. They must not have been used to meet the requirements for any degree previously earned.
3. They must have been taken typically within the time limits applicable to expected degree completion at UMES (e.g., up to five years prior to the Master's program admission, up to nine years prior to the Doctoral program admission but subject to criterion D below).
4. The department or program to which the student has been admitted at UMES must certify that the courses are appropriate and current to the degree program the student is pursuing at UMES.
5. The student must have earned a grade of "B" or better in the courses offered for transfer credit.



A student-seeking acceptance of transfer credit is advised to submit the necessary transcripts and certification of UMES department/program approval to the UMES Graduate School as promptly as possible, for its review and processing.

Transfer grades earned at other than University System of Maryland campuses are not factored into the computation of cumulative grade point averages at UMES.

### Criteria that Courses Must Meet to be Accepted for Graduate Credit (the Winter Session)

Any course(s), workshop(s) or seminar(s), planned to take place in a span of time less than a normal academic semester or a winter/summer session, and offering graduate credit to participants, must meet the following criteria:

1. There must be 15 "contact hours" per graduate credit.
  - a. Lectures: 1 contact hour per 50 minutes lecture.
  - b. Non-lecture (laboratory, workshops, discussion and problem working sessions, etc.): One contact hour per 2 or 3 hour sessions.
2. Ordinarily, no more than three "contact hours" per day will be permitted. Three "contact hours" are equivalent to 0.2 credits. Exceptions, such as intensive all day sessions, require the prior approval of the Graduate School.

During the short winter session, lecture, non-lecture and research credit courses are limited to a maximum two hours of credit without prior approval. The MAT program is excepted. All students, regardless of program, may not take more than one course during this period.

### Course and Credit Changes

A graduate student may change elections (i.e., drop or add a course, change between audit and credit status, change number of credits for a variable credit course within the listed range, cancel registration or withdraw for the semester/session) by obtaining the appropriate approvals and observing published deadlines and procedures of the applicable offices of the Registrar or Academic Affairs, and if the course/credits set up allows the change.

### Procedures for Withdrawal from the Graduate School/Program

Graduate students wishing to withdraw from a program may do so at any time.

The procedure for withdrawal is to submit a letter of the withdrawal to the program coordinator and the Graduate School. The letter will be reviewed and processed, and the necessary offices notified of the action. The requested date of resignation will be used as the effective date of withdrawal.

Although students may withdraw during the course of a given semester/session, they remain liable for all fees and other obligations due UMES, and their academic records will reflect their standing at the time of withdrawal. Program withdrawal terminates a student's admission. The act of withdrawal from a program prohibits readmission to the same program to complete it, should the student wish to return to graduate study at a later time.

Refer to the Graduate School definition and process of readmission by going to [www.umes.edu/Grad/Default.aspx?id=22720](http://www.umes.edu/Grad/Default.aspx?id=22720).

### Procedure for Canceling Registration (Withdrawal) for a Semester/Session

To cancel a registration for a given semester/session the Application for University Withdrawal form is used.

The canceling of registration is treated by that office as a withdrawal from the University for the semester or session.

Cancellation of one's classes during the course of a semester/session is not meant to be used as a means of avoiding poor grades.

### Minimum GPA/Grades for Graduate Students

A minimum grade point average of 3.0, or "B," on all 400 and above level courses taken for graduate credit in the student's approved program of study is required to receive the degree.

Graduate students are required to meet graduate program retention and exit requirements for acceptable grades in order to continue in the program and to receive the degree.

A grade of "D" is not acceptable for a graduate core or required course or an elective course to be used to satisfy graduate program requirements for a degree.

### Policy on Incomplete Grades

The following policy on Incomplete ('I') grades pertains to regular courses, not to the variable research credit courses available for the different Master's programs (thesis, project, etc.) and the Doctoral dissertation.

The grade of 'I' (Incomplete) is to be given only to a graduate student whose work in a course has been qualitatively satisfactory, and when because of illness, or other circumstances beyond his/her control, the graduate student has been unable to complete the stated requirements of the course.

In no case will the grade of 'I' be recorded for a graduate student who:

1. has not completed satisfactorily the major portion of the coursework; and/or
2. wishes to improve his/her grade by additional course work not offered to all students enrolled in the course.

In cases in which an 'I' grade is issued, the graduate student may not re-register for the course until the 'I' is removed by completing work outstanding and meeting all course requirements.

Work must be completed by the end of one year, or the 'I' becomes 'W' (Withdrawal). Before the end of the one year period, a student upon written petition to the Graduate School may request on extension of time if circumstances warrant further delay.

An 'I' cannot be removed by earning credit by examination.

When the graduate student receives the terminal grade, he/she may repeat the course as provided for any course where repeats are authorized.

Accelerated or intensive weekend graduate programs, because of the accelerated process of coursework and other degree requirements to meet a degree program completion within an abbreviated time frame (e.g., three years), have the option of using a six-month time frame to facilitate the removal of incomplete grades in a timely manner.

## Grading Systems

The conventional 'A' through 'F' grading system is used in graduate level courses.

A 'Satisfactory' or 'Unsatisfactory' (S/U) grading system may be used, at the discretion of the department or program, for certain types of graduate study. These include courses which require independent work. Master's project and research projects may also be appropriate for such S/U grading systems.

Thesis and dissertation research use the S/U grading system (see the subsection below).

Courses labeled 'Topics', 'Special Problems', 'Seminar', 'Clinical', 'Practicum', or 'Internship' may use either the 'A'-'F' or 'S/U' grading system.

Only one grading system will normally be used for a single course in a particular semester/session. The grading system will be designated in the course database by the department or program offering the course (excluding courses already specified for only one grading system).

## Grading System for Research Credit Courses

A grade of S/U should be used instead of an 'I' grade for 799, 899 and similar research credit courses (500 to 798 series) which are offered/carried over or continued over semesters or sessions, usually with variable credit hours, and whose objective is the long-term development of a thesis, dissertation, Master's project, or research project. In these instances a 'Satisfactory' ('S' grade) completion of the required research credit hours satisfies only part of the graduation requirements.

A successful thesis or dissertation defense and final approved copy of the thesis or dissertation are essential for the degree programs with the thesis option and the dissertation requirement.

A final written document and an oral presentation, both acceptable to the student's Advisor/Advisory Committee, are normally the requirements for Master's projects and research projects.

## Computation of Grade Point Average (GPA)

An 'A' is calculated at 4 quality points, 'B' at 3 quality points and 'C' at 2 quality points. The grades of 'D', 'F' and 'I' receive no quality points. Courses taken with 'A' to 'F' letter grades will be used in calculating the Grade Point Average.

Students may request that prerequisite undergraduate course grades be excluded from being computed in the cumulative GPA of their graduate record.

## Grade Change, Repeating of Courses, Arbitrary and Capricious Grading

A student may repeat any course where repeats are authorized, in an effort to earn a better grade. The later grade, whether higher or lower, will be used in computing the GPA. While matriculated at UMES, a graduate student who earns a grade of 'F' or 'D' in residence may not advance his/her credit hours earned toward a UMES degree by repeating the course at another institution.

Grades for graduate students remain part of each student's permanent record. In addition to the repeating of courses, grades may be changed only by the original instructor on the supplementary grade report form and approved by both the department Chair and the Dean. Changes may be made only in circumstances in which an actual mistake was made in determining or recording the grade, to record a missing grade from the official grade roster or transcript, or to remove an incomplete grade.

A grade of 'W' recorded on the transcript does not qualify for the change of grade process.

Allowable grade changes other than an 'I' (Incomplete) grade must be received in the Registrar's Office in the specified 60 calendar day period (see Registrar Office policy for specifics - [www.umes.edu/Registrar/Content.aspx?id=3340](http://www.umes.edu/Registrar/Content.aspx?id=3340)).

The UMES procedures for Review of Alleged Arbitrary and Capricious Grading (1992) address and cover both graduate and undergraduate students and will be used.

Where a faculty composition or venue are not workable, the Graduate School may appoint a required tenured professor(s) from the graduate faculty at-large to hear the case, which also may be heard outside the unit offering the course(s) in dispute.

## Auditing of Graduate Courses

A graduate student, regardless of program or status, may audit a graduate course with the written permission of the course instructor and the student's advisor and subject to certain restrictions.

Courses which may not be audited are

1. Internships
2. Research credit courses such as 799 thesis and 899 dissertation, the 699/798 Master's projects, and any other program's research-designated courses.
3. Any graduate course in the graduate program with restricted enrollment such as Physical Therapy, the Master of Arts in Teaching and intensive weekend programs.

Audited courses will appear on the student's academic record as 'AU' and may not be used to repeat a course for which credit has been previously earned.

Audited courses do not earn credit, nor count as part of the credit hour load, nor may be applied toward the requirements of a graduate degree. The regular tuition rate applies to audited courses. Once a course has been audited, it cannot be converted to credit, except as below.

If students later find that an audited course they took is/will be a required course for the degree program in which they are matriculated, they must file a *Petition for Waiver of Regulation* to be considered to repeat the course for credit.

## Prerequisite Courses

Prerequisite courses (e.g., 100 to 400 numbered undergraduate and selected 500 or 600 numbered graduate) may be required to satisfy conditions of provisional admission status or for preparation and understanding of advanced graduate level courses (500 or 600 and above numbering sequence). Prerequisite courses may be satisfied before or after enrollment in the University of Maryland Eastern Shore, but if after enrollment, must be completed within the first academic year of admittance.

Prerequisite courses provide no graduate credit (if undergraduate numbered) and do not count toward the course credits required to graduate from a graduate degree program at UMES.

Prerequisite undergraduate courses may be satisfied by credit by examination at UMES if the graduate program allows it (see *Credit by Examination* subsection – Pg. 40).

Graduate students satisfying undergraduate numbered prerequisite courses must earn a letter grade of 'C' or better in the course unless a graduate program/department stipulates a higher grade. A Pass/Fail option may not be used to satisfy prerequisite courses taken at UMES.

## Experimental Courses

Students should confirm whether experimental courses may be elective courses for them or possible interim substitute core courses with the approval of the advisor and Advisory Committee as appropriate.

## Undergraduate and Graduate Combined Instruction

In 400 or 400/600 level courses approved to be applied toward a graduate degree program, which is combined undergraduate and graduate instruction, requirements for work expected in the course for graduate students will be specified to reflect the level of complexity and specialization expected of graduate study.

## The Academic Record (Transcript)

A graduate student's academic record (transcript) is intended to serve as a complete history of that student's academic progress at UMES. As such, it cannot be altered except in conformance with stated UMES Registrar and Graduate School policies (see *Grade Change* section).

Under no circumstances will the academic records be altered because of dissatisfaction with a grade (original or repeated) or other academic accomplishment.

# DEGREE REQUIREMENTS

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## Graduate School Requirements Applicable to all Master's Degree Programs

The entire course of study undertaken for any Master's degree must constitute a unified and coherent program, which is approved by the student's advisor and, for some programs, the program coordinator in the department.

A minimum of 30 semester hours, in courses acceptable for credit towards a graduate degree, is required. In certain cases, six of the 30 semester hours must be thesis research credits. The graduate program must include at least 12 hours of course work at the 600 level or higher.

If the student is inadequately prepared for the required graduate courses, additional courses may be required, which may not be considered as part of the student's overall program of study for the degree.

Credits to be applied to a student's program for a Master's degree at UMES cannot have been used to satisfy any other previously earned Master's degree.

## Grade Point Average (GPA)

The student seeking any Master's degree must maintain a GPA of 3.0 ("B" average) over all courses taken for graduate credit.

## Time Limitation

All requirements for the Master's degree must be completed within a five-year period. This time limit also applies to any transfer work from other institutions to be included in a student's overall program of study.

## Leave of Absence; Extension of Time Limitation Period

In cases of unusual and/or compelling circumstances, a leave of absence for up to one academic year (two semesters) may be granted to a matriculated graduate student by the Graduate Studies Dean, at the recommendation of the Academic Advisor and the Graduate Program Coordinator.

An approved leave of absence will stop the five-year time clock for Master's students to complete their degree program (nine years for Doctoral students).

In cases of unusual and/or compelling circumstances, an extension of the time limitation period for the degree may be considered for a matriculated graduate student. If granted, the extension will normally be for no more than one academic year (two semesters). The extension is granted by the Graduate Studies Dean on the recommendation of the Academic Advisor and the Graduate Program Coordinator.

Under both circumstances, the Graduate School's *Petition for Waiver of a Regulation* ([www.umes.edu/Grad/Default.aspx?id=17612](http://www.umes.edu/Grad/Default.aspx?id=17612)) form should be completed.

## Minimum Residence Requirements; Continuous Enrollment

A minimum residence for a degree program is one calendar year of full-time equivalent study (18 credit hours) taken on campus or at an off-campus site where the UMES program is offered. Full-time students may satisfy this requirement in one year; part-time students in two years after enrollment.

The graduate programs may require a continuous enrollment for admitted students into the program during each semester of the academic year and/or session until the student completes the degree requirements. The number of credit hours required per registration each semester or session may vary according to the course credit offerings and degree requirements of the program.

## Comprehensive Examinations (applicable to all Master's and Doctoral Programs)

Graduate Programs have the option of holding qualifying examinations before students complete the thesis, non-thesis option, dissertation or Doctoral research project. These examinations are often termed 'comprehensive examinations,' and are usually composed of a written and oral segment.

Comprehensive examinations are usually given after a student has satisfactorily completed the coursework in a program. The examinations test a student's understanding of, and ability to integrate knowledge in his/her program of study. Because graduate programs vary in format, the nature and content of comprehensive examinations, if given, will vary by program.

The Graduate School's minimum format for conducting comprehensive examinations, whether taken individually or a group is:

- a. Graduate program coordinators will have questions for comprehensive examinations from the faculty reflecting the curriculum and/or student's program of study.
- b. Students must apply to the program to take the comprehensive examination(s) and be found eligible to do so.
- c. Comprehensive examinations are scheduled to be taken in a time block (a set-time period, e.g., 6-8 hours duration).
- d. Students taking comprehensive examinations are notified in advance of the examination date, location and time, and provided with information on proposed types of examination questions or categories of testable information (samples may be on file in the program).
- e. The written examination normally precedes an oral examination (if required), which is likewise to be scheduled shortly after the written examination and in a specified time duration.
- f. Written comprehensive examinations taken as a group must be monitored.
- g. Written comprehensive examination must be graded within a specified time period (e.g., within 21 days), so the oral examination may be scheduled.

- h. The written examination must be passed before taking the oral examination (if the latter is required).
- i. The graduate programs determine the grading and voting policy for pass/fail on the examination, which are stated in their procedures' guidelines for the comprehensive examinations.
- j. Students and the Graduate School are notified of the comprehensive examination results, written and oral, and, in the case of *'failure'*, the deficiencies in performance, specified in detail, that led to *'failure'*.
- k. Unethical actions in the written comprehensive examination will invoke action under the campus' academic honesty policy.
- l. Comprehensive examination(s) may be retaken only once in the event the student fails the initial examination in whole or part (written and/or oral). The second examination should be given no earlier than four months after the first examination and no later than one calendar year from the date of the initial examination. If the student fails the second time, the admission status is terminated.

In the program's section of the Graduate School Catalog or separate program handbook or procedures' guidelines, students will find the particulars of the comprehensive examination process for their program. Graduate programs may set more stringent requirements than the minimum set by the Graduate School.

### Internships and Practicums

Internships and/or practicums may be required or optional for a program. Students may elect an internship for practical work experience/training prior to completing the thesis/non-thesis option of a program, usually after all coursework has been completed. Students may need and elect an internship as the preparation to seek initial, entry-level certification in a profession.

Practicums may be identified as clinical or workplace and occupation based.

If a program requires an internship or practicum as part of the curriculum and degree completion, the program must assist the student in arranging an internship or practicum appropriate to the program; specify the time period, the purpose and desired outcome(s) of the internship or practicum; arrange for the supervision and grading of the internship or practicum; and set the format for approval of the internship or practicum (e.g., any proposal to initiate and any final product such as a scholarly paper or reports).

Subject to program approval, an internship or practicum may be repeated once.

### Scholarly Products

For non-thesis option, graduate programs and professional Doctorates, scholarly products may consist of a major seminar or research paper, a major or extensive research project, a Master's project and a creative component paper. The graduate programs may set the format for the scholarly products of non-thesis option programs and professional Doctorates, any of which products may also be accompanied by an oral presentation in addition to a written version.



Theses and dissertations are scholarly products for thesis-required Master's program and Ph.D. and Ed.D. programs respectively.

Scholarly products for required internships may consist of a culminating paper or series of reports, oral presentations or some combination thereof as determined by the program to measure the student's progress and outcome.

The Graduate School receives a copy of scholarly products for assessment of student learning and quality of research or scholarship. The Graduate Studies Dean approves the final official thesis or dissertation to be bound for the library's collection

### Co-Advisement of Student's Thesis

A Master's student may be equally and jointly advised by two graduate faculty members. The faculty members may be Associates or regular members of the UMES Graduate Faculty. For the Marine-Estuarine-Environmental Sciences program and the graduate programs in Agriculture, graduate faculty at other USM campuses and specialists at other institutions may also be used. These individuals acquire a special membership on the UMES Graduate Faculty or will have a USM Inter-Institutional (IIGF) Graduate Faculty Membership.

### Participation in Commencement

All requirements for graduation must be completed before the graduate student is allowed to participate in Commencement exercises. To be eligible, graduate students must have:

1. Abided by the dates set forth in the Graduate School's announcement on semester deadlines for graduation and marching in Commencement, pertaining to completion of, as applicable, comprehensive examinations, seminar or research papers, Master's thesis and oral presentations or dissertations and defenses. In the case of a thesis or dissertation, the student must have submitted copies acceptable to the Graduate School for binding.
2. Satisfactorily completed any other particular requirements of the graduate degree which they are seeking.
3. Processed on their behalf the Graduate School's "*Certification of Completion of Master's Degree*" (or Doctoral Degree) form by the designated signatories.  
(<http://www.umes.edu/assets/0/232/1278/3114/eefdf6a-77bc-4d6e-aaa4-ecaa23be3205.pdf>).

Outstanding financial obligations must also have been satisfied.

### Additional Requirements

In addition to the preceding requirements, special requirements of the different graduate programs may be imposed. For these special requirements, consult the specific graduate program listings in this Catalog.

Graduate School Requirements for the Degrees of Master of Arts and Master of Science.

## Thesis Option

### Course Requirements

1. A minimum of 30 semester hours, including six hours of thesis research credit (799), is required for the degrees of Master of Arts and Master of Science.
2. Of the 24 hours required in graduate courses, no less than 12 must be earned in the major subject.
3. No less than one-half of the total required course credits for the degree, or a minimum of 12, must be selected from courses numbered 600 or above.
4. Degree programs may stipulate course credit hours beyond the minimum.

## Thesis Requirement

1. A thesis must be submitted for the Master of Arts and Master of Science degrees, except for those programs in which a non-thesis option has been approved by the Graduate School, in conformity with the policy of the UMES Graduate Council.
2. Approval of the thesis is a responsibility of an Examining Committee appointed by the Graduate Studies Dean, on the recommendation of a student's advisor. The advisor is the chairperson of the Committee, and the remaining members of the Committee are members of the Graduate Faculty who are familiar with the student's program of study and research.
3. A replacement Committee member must be approved by the Graduate Studies Dean.

Directions for the preparation and submission of thesis can be found in the *"Guide to the Preparation of Theses and Dissertations"* available at the Graduate School's webpage at [www.umes.edu/Grad/Default.aspx?id=17594](http://www.umes.edu/Grad/Default.aspx?id=17594).

## Research Assurances

All faculty and student research and scholarly activities conducted at UMES, including student seminar or research papers, Master's and research projects and thesis and dissertation research, and whether primary or secondary-derived research, must be conducted in accordance with Board of Regents, USM, state and federal policies.

For research involving animals, human subjects, or materials that may pose biological or chemical hazards, graduate students should seek information and guidance from the Office of Sponsored Programs.

UMES has established Internal Review Boards which meet periodically to review the aforementioned types of research protocols for compliance with established standards and regulations, including those established by Federal agencies (e.g., FDA, USDA, NIH).

Graduate students may seek guidance from the Graduate Studies Dean and the Director of the Sponsored Programs Office about scholarly misconduct policies and issues, which include plagiarism, improper credit citations, falsification or manipulation of a study, sources and

data, intellectual property (copyright/patent) policy, among others. Scholarly misconduct violations are handled under the University's *Policy on Academic Honesty and Integrity* (PDF available at [www.umes.edu/cms300uploadedFiles/Academic%20Honesty%20Statement%20A.pdf](http://www.umes.edu/cms300uploadedFiles/Academic%20Honesty%20Statement%20A.pdf)).

## **Oral Examination**

See later section on *Established Procedures for Conduct of the Master's Thesis Examination* (Pg. 57) for specifics.

Upon written approval of the Graduate Studies Dean, a graduate student in otherwise good standing, but lacking a maximum of two courses toward completely fulfilling the Master's course requirements, may be allowed to undergo the oral examination, only if the student will complete the outstanding courses in the same semester in which the oral examination is given.

The duration of the examination is normally about an hour, but may be longer, if necessary, to insure an adequate examination.

## **Non-Thesis Option**

The requirements for Master of Arts and Master of Science degrees without thesis vary among the graduate programs in which this option is available. Standards for admission are identical with those for admission to any other Master's programs. The quality of work expected of each student is also identical to that expected in the thesis program.

The general requirements for those on the non-thesis program are:

1. A minimum of 30 semester credit hours in courses approved for graduate credit with a minimum average grade of "B" in all course work taken.
2. A minimum of 18 semester credit hours in courses numbered 600 or above. In most cases, the submission of a major research project or seminar paper.
3. Successful completion of a comprehensive final examination, written or oral, or an oral defense.
4. Practicums/internships, if required.

## **Graduate School Requirements for the Degree of Master of Arts in Teaching**

The Master of Arts in Teaching (MAT) degree requirements include:

1. A minimum of 39 credit hours of coursework with an overall grade point average of 3.0 or higher.
2. Successful completion of a written and/or oral comprehensive examination, a seminar paper and internship.
3. Adherence to the Research Assurances section of the Graduate School Catalog as applicable.

## **Graduate School Requirements for the Degree of Master of Education**

The Master of Education (M.Ed.) degree requirements include:

1. A minimum of 30 credit hours in course work with a grade point average of 3.0 ("B") or better, usually exclusive of internships and practicums. Grades for courses not a part of the program, but taken in graduate status, will be computed in the average.
2. A minimum of 15-18 credit hours in courses numbered 600 to 800 series, with usually no more than 12 credit hours in the 400 series.
3. A successful completion of a written and/or oral comprehensive examination, a seminar paper by the end of the coursework and practicum and/or internship if required.
4. Adherence to the Research Assurances section of the Graduate School Catalog as applicable.

## **Graduate School Requirements Applicable to the Doctor of Philosophy (Ph.D.) and Doctor of Education (Ed.D.) degrees**

### **Credit Requirements**

The UMES Graduate School requires that every student seeking the Ph.D. or Ed.D. degree, register for a minimum of 12 research credits. The number of research and other credit hours required in the individual degree programs varies according to the program.

### **Residence Requirements**

The equivalent of a minimum two years of full-time coursework and completion of comprehensive examinations typically meets the residence requirements, whether taken on campus or at an off-campus site where the UMES degree program is offered.

Coursework taken at other institutions, offered in partial fulfillment of the requirements for the Ph.D. or Ed.D. degree at UMES, must be submitted, with the recommendation of the UMES graduate program concerned, to the UMES Graduate School for approval within the first year of enrollment.

Official transcripts of the work must be filed in the UMES Graduate School.

Doctoral programs which are full-time, continuous enrollment of at least nine credit hours per semester and summer session and which follow an accelerated, intensive course scheduling format, meet the minimum residence requirement.

### **Admission to Candidacy**

Preliminary or comprehensive examinations (or other such substantial tests as the programs may elect), internships and defense of the dissertation proposal, are typically prerequisites for admission to candidacy. The policy governing the number of times such examinations, internships or proposal defenses may be taken and the outcome for failure to pass them, is found in the subsections on *Comprehensive Examinations* (Pg. 47) and *Internships* (Pg. 48) in the *Graduate School Requirements Applicable to All Master's Degree Programs* section.

A student must be admitted to candidacy for the Doctorate within five-years after admission to the Ph.D. or Ed.D. program. It is the responsibility of each student to submit an application for admission to candidacy when all the requirements for candidacy have been fulfilled, including regular admission status. The application form is submitted to the program/department for action and forwarded to the UMES Graduate School. The application form is available on the Graduate School website at <http://www.umes.edu/Grad/Default.aspx?id=17612>.

The timeline for *Admission to Candidacy* for Doctoral programs designed as full-time, continuous enrollment programs per semester/session and with an accelerated course scheduling format will typically be within the third year of the program to follow a three-year expected program completion. Students who fall out of the continuous enrollment pattern follow the above five-year rule for admission to candidacy.

### Time Limitation

The student must complete the entire program for the degree, including the dissertation and final defense, during a four-year period after admission to candidacy. Extensions of time are granted only under the most unusual circumstances.

If students fail to complete all requirements within the time allotted and are in good academic standing, they must submit another application for admission to the UMES Graduate School and, if readmitted, another application for *Admission to Candidacy*, after satisfying any program admission pre-requisites prior to the *Admission to Candidacy*.

For leaves of absence, Ph.D. or Ed.D. students follow the same policy as for Master's students (see *Leave of Absence* subsection under *Graduate School Requirements Applicable to all Master's Degree Programs*).

The time limit for required full-time, continuous enrollment programs per semester and session, with an accelerated course scheduling format and with a three-year expected program completion design is three years from initial enrollment.

Students in this type of program who take leave or need to extend the time to complete degree program requirements may have the maximum time allotment as other Doctoral programs. Students who take leaves and time extension may be subject to changed curriculum and other requirements implemented during their absence.

### Internship

For programs which require an internship, see the subsection on *Internships* (Pg. 48) in the *Graduate School Requirements Applicable to All Master's Degree Programs*.

### Dissertation

The ability to undertake independent research and provide sufficient evidence of scholarship is demonstrated by submission of an original dissertation, required of all candidates for a Ph.D. or Ed.D. degree. The topic of the dissertation must be approved by the candidate's program committee.

The subsection on *Research Assurances* listed under the *Graduate School Requirements for the Master of Arts/Science Thesis Option*, is applicable to dissertation research. Candidates are advised to check whether their proposed research will be subject to a prior approval process by a UMES Internal Review Board.

Approval of the dissertation is a responsibility of an Examining Committee appointed by the Graduate Studies Dean, on the recommendation of a student's advisor and student input. The advisor is the chairperson of the Committee, and the remaining members of the Committee are members of the Graduate Faculty who are familiar with the student's program of study and research. A replacement Committee member must be approved by the Graduate Studies Dean.

During preparation of the dissertation, all candidates for the Ph.D. or Ed.D. degree must register for the prescribed number of semester hours of Doctoral Dissertation Research (899) at UMES. A minimum of 12 semester hours of 899 credits is required.

Directions for the preparation and submission of dissertations can be found in the *Guide to the Preparation of Theses and Dissertations* available for download on the Graduate School website at [www.umes.edu/Grad/Default.aspx?id=17612](http://www.umes.edu/Grad/Default.aspx?id=17612).

### Co-Advisement of Student's Dissertation

A Doctoral student may be equally and jointly advised by two Graduate Faculty members. The faculty members must be regular members of the UMES Graduate Faculty (the exceptions are the Marine- Estuarine-Environmental Sciences (MEES) program and the accelerated weekend Doctoral programs).

For the accelerated weekend Doctoral programs, the Graduate Studies Dean's representative (see section below) may also serve as a co-advisor of the student's dissertation.

For the MEES and weekend Doctoral programs, faculty at USM campuses and other universities, and specialists and practitioners at other institutions may also be used. These individuals acquire a special membership on the UMES Graduate Faculty or will have a USM Inter-Institutional Graduate Faculty Membership.

### Publication of the Dissertation

If a student wishes to publish all, or a portion, of the dissertation prior to its defense and approval by the UMES Dissertation Examining Committee, he/she must first seek the approval of the Graduate Studies Dean by submitting a letter endorsed by the dissertation advisor, which presents the case for early publication.

### Final Defense

The final oral defense of the dissertation is a requirement in partial fulfillment of the Ph.D. or Ed.D. degree.

One or more members of the Dissertation Examining Committee may be persons from other institutions, including USM campuses, who hold a Doctorate and who are distinguished scholars or specialists and experiential leaders in the field of the dissertation.

One member of the Committee, designated as the Graduate Studies Dean's representative, besides having the usual responsibility of a faculty examiner, has the additional responsibility of assuring that the examination is conducted according to established procedures.

Any disagreement over the examination procedures is referred to the Graduate Studies Dean's representative for decision.

The Graduate Studies Dean's representative may be a separate member appointed by the Graduate Studies Dean.

The student is responsible for distributing a complete copy of the dissertation to each member of the Committee at least ten working days before the defense.

See the section below on the *Established Procedures for Conduct of the Doctoral Dissertation Defense* (Pg. 62).

### Accelerated Doctoral Programs

Accelerated or intensive Doctoral programs, typically the weekend model, may develop and use a separate manual to describe the format, process and conduct of the coursework, comprehensive examinations, internship, dissertation proposal and the defense, retention and completion of degree program requirements, so long as the Graduate Studies Dean approves the content of these manual(s).

The Graduate Studies Dean approves the membership of the Research Advisory Committee before it begins to advise and guide the student on the dissertation process and approves any replacement member. See also the section above on *Co-advisement of a Student's Dissertation* (Pg. 54).

### Participation in Commencement Exercises

All requirements for graduation must be completed before the graduate student is allowed to participate in Commencement exercises. To be eligible, graduate students must have:

1. Abided by the dates set forth in the Graduate School's announcement on semester deadlines for graduation and marching in Commencement, pertaining to completion of, as applicable, comprehensive examinations, seminar or research papers, Master's thesis and oral presentations or dissertations and defenses. In the case of a thesis or dissertation, the student must have submitted copies acceptable to the Graduate School for binding.
2. Satisfactorily completed any other particular requirements of the graduate degree which they are seeking.
3. Processed on their behalf the Graduate School's *Certification of Completion of Master's Degree* (or Doctoral Degree) form by the designated signatories.  
([www.umes.edu/assets/0/232/1278/3114/eefdf6a-77bc-4d6e-aaa4-ecaa23be3205.pdf](http://www.umes.edu/assets/0/232/1278/3114/eefdf6a-77bc-4d6e-aaa4-ecaa23be3205.pdf)).

Outstanding financial obligations must also have been satisfied.

## Additional Requirements

In addition to the preceding requirements, special requirements of the different graduate programs may be imposed. For these special requirements, consult the specific graduate program listings in this Catalog.

### **Graduate School Requirements for the Degree of Doctor of Physical Therapy**

## Credit and General Program Requirements

The professional Doctor of Physical Therapy (DPT) degree requirements include four major areas of learning and an extensive research project:

- A. 101 semester hours of didactic course work as specified in the program.
- B. 18 semester hours of clinical education experience.
- C. 3 semester hours of independent study/elective courses in specialty areas.
- D. 6 semester hours in critical inquiry/research.
- E. Successful completion and submission of a research project in written form and an oral presentation on the project.

## Residence Requirements

Since the Doctor of Physical Therapy degree is a full-time continuous enrollment program leading to an expected degree completion in three years following enrollment, the residence requirement is satisfied.

## Time Limitation

While the expected degree completion for the Doctor of Physical Therapy (DPT) degree is three years of full-time study and research following enrollment, under extenuating circumstances, DPT students may seek leaves of absences and extensions of time as the Department of Physical Therapy will allow.

## Leave of Absence; Extension of Time Limitation Period

In cases of unusual and/or compelling circumstances, a leave of absence for up to one academic year (two semesters) may be granted to a matriculated graduate student by the Graduate Studies Dean, at the recommendation of the Academic Advisor and the Graduate Program Coordinator.

An approved leave of absence will stop the nine-year time clock for Doctoral students to complete their degree program (five years for Master's students).

In cases of unusual and/or compelling circumstances, an extension of the time limitation period for the degree may be considered for a matriculated graduate student. If granted, the extension will normally be for no more than one academic year (two semesters). The



extension is granted by the Graduate Studies Dean on the recommendation of the Academic Advisor and the Graduate Program Coordinator.

Under both circumstances, the Graduate School's *Petition for Waiver of a Regulation* ([www.umes.edu/Grad/Default.aspx?id=17612](http://www.umes.edu/Grad/Default.aspx?id=17612)) form should be completed

Students who take leaves and time extensions may be subject to changed curriculum and other requirements implemented during their absences.

## Research and Research Project

The Graduate School policies on Research Assurances, Internships and Practicums and scholarly products apply to the DPT program.

## Admission to Candidacy

The Graduate School policy on *Admission to Candidacy* for other Doctoral programs applies to the DPT program except that the admission should normally take place within the third year of the program. Students who fall out of the DPT continuous enrollment pattern follow the five-year rule for *Admission to Candidacy*.

## Participation in Commencement Exercises

The Graduate School policy applicable to other graduate programs applies to the DPT program. Please refer to the Participation in Commencement section of the Graduate School Requirements Applicable to All Master's Programs.

## **Established Procedures for Conduct of the Master's Thesis Examination**

A. **Establishment of the Thesis Examining Committee:** The Thesis Examining Committee is appointed by the Dean of Graduate Studies, in accordance with the policies listed below.

1. *Eligibility:* A student is eligible to be examined on a thesis if the student:
  - a) has met the graduate program requirements for a thesis examination including a properly formed Advisory Committee and approved thesis topic;
  - b) is in good standing as a graduate student at the University and has regular admission status;
  - c) is registered for at least one credit;
  - d) has a valid Graduate School approved Thesis Examining Committee;
  - e) has a 3.0 GPA in the graduate program in which the student is enrolled; and
  - f) if this is the second examination, the examination has been approved by the Graduate School.

The final oral examination shall be held when the student has completed the thesis to the satisfaction of the student's Advisor. However, a thesis draft which is not presented in the standard thesis format, or the research and conclusions are incomplete, shall not be considered completed by the Graduate School for purposes of the student's eligibility to be examined on the thesis.

2. *Thesis Examining Committee Membership:* The Committee must consist of a minimum of three members, at least two of whom must be regular or Associate Members of the UMES Graduate Faculty and at least one must be a full-time faculty in a UMES academic

department. Additional Committee members may be invited to serve at the discretion of the program. Each member of the Thesis Examining Committee must be a member of the UMES Graduate Faculty -- whether in a regular, Associate or Special Member category -- or an approved Inter-Institutional Graduate Faculty (IIGF) Member. An IIGF member may serve as Chair of the Committee. The Committee is usually composed of the original program of Study/Research Advisory Committee for the student.

3. *Nomination of the Thesis Examining Committee:* Membership on a Thesis Examining Committee requires nomination by the student's Advisor, concurrence (if required) by the graduate program coordinator in the student's graduate program, and approval by the Dean of Graduate Studies who appoints the Committee. The nomination of a Thesis Examining Committee should be provided to the Graduate School at least three weeks before the date of the expected thesis examination. The thesis examination cannot be held until the Graduate School approves the composition of the Thesis Examining Committee.
4. *Research Assurances:* The following research assurances must be approved prior to the initiation of any thesis-related research, and the approvals must be provided to the Graduate School at the time the student submits the Nomination of Examining Committee form.
  - a) If the thesis research involves the use of vertebrate animals, animal use protocols must be approved by the campus Animal Care and Use Committee.
  - b) If the thesis research involves human subjects, the research must be approved by the campus Institutional Review Board.
  - c) If the thesis research involves hazardous materials, either biological or chemical, or recombinant RNA/DNA, the research must be approved by the appropriate University Committee.

The UMES Office of Sponsored Programs is the contact office for guidance on and the processing of research assurances.

5. *Chair:* Each Thesis Examining Committee will have as Chair the student Advisor, who must be a Regular or Associate Member of the Graduate Faculty. Thesis Examining Committees may be co-chaired:
  - a) if co-advisement was approved at the time of the student's admission to Graduate School, or
  - b) if, upon written recommendation of the student's Advisor, concurrence (if required) of the graduate program coordinator, and with approval of the Dean of Graduate Studies.

At least one of the Co-Chairs must be a regular or Associate Member of the UMES Graduate Faculty.

6. *Special Members:* Individuals who have been approved for Special Membership in the UMES Graduate Faculty may be nominated to serve on Thesis Examining Committees. However, these individuals must be in addition to the required two regular or Associate Members of the UMES Graduate Faculty (see A-2 above).
7. *Service of Former UMES Faculty Members:* Graduate Faculty who terminate employment at UMES (and who do not have emeritus status) retain their status as members of the

Graduate Faculty for a twelve-month period following their termination. Thus, they may serve as members and Chairs of Thesis Examining Committees during this twelve-month period if they are otherwise eligible. After that time, they may no longer serve as Chairs of Thesis Examining Committees, although, if granted the status of Special Members of the Graduate Faculty, they may serve as Co-Chairs (see A-5 above).

Professor Emeriti and Associate Professor Emeriti of UMES may serve or chair Thesis Examining Committees provided they were regular or Associate Members of the Graduate Faculty at the time of retirement.

## **B. Procedures for the oral examination**

1. *Oral Examination Requirement:* Each Master's thesis student is required to defend orally his/her Master's thesis as a requirement in partial fulfillment of the Master's degree. An additional comprehensive written examination may also be required at the option of the program.
2. *Committee Preparation:* The members of the Thesis Examining Committee should receive the thesis ten working days before the scheduled examination. Should the Thesis Examining Committee deem it reasonable and appropriate, it may require submission of the thesis more than ten working days in advance of the examination.
3. *Attendance at the Examination:* Oral examinations must be attended by all members of the student's officially established Thesis Examining Committee as approved by the Dean of Graduate Studies. All examinations must be open to UMES Graduate Faculty and the campus community. Should a last minute change in the composition of the Thesis Examining Committee be required, the change must be approved by the Dean of Graduate Studies in consultation with the graduate program coordinator (if required) and the Chair of the student's Thesis Examining Committee.
4. *Location of the Examination:* Oral examinations of theses must be held in University facilities that are readily accessible to all members of the Thesis Examining Committee and others attending the examination. The Chair of the Thesis Examining Committee selects the time and place for the examination, notifies the other members of the Committee and the candidate, and releases the public notice of the examination.

Under special circumstances as approved by the Dean of Graduate Studies, and if it can be logistically arranged, the interactive video network or other acceptable electronic medium may be used to accommodate an off-site Committee member. In this case, the Committee member must follow-up with a written recommendation to the Committee Chair.

5. *Invalidation of the Examination:* The Dean of Graduate Studies may void any examination not carried out in accordance with the procedures and policies of the Graduate School.

In addition, upon the written recommendation of the Thesis Examining Committee or any member thereof, and upon consultation with the Committee Chair, the Dean of Graduate Studies may rule an oral examination to be null and void.

6. *Conclusion of the Examination:* After the oral examination of the student, the Thesis Examining Committee discusses in closed session whether or not the thesis (including its examination) has been satisfactory. The Committee has the following alternatives:
- a) To accept the thesis without any recommended changes and sign the Report of Examining Committee.
  - b) To accept the thesis with recommendations for changes, and, except for the Chair, sign the Report of Examining Committee. The Chair will check the thesis and, upon his/her approval, sign the Report of Examining Committee.
  - c) To recommend revisions to the thesis and not sign the Report of Examining Committee until the student has made the changes and submitted the revised thesis for the Thesis Examining Committee's approval. The Thesis Examining Committee members sign the Report of Examining Committee if they approve the revised thesis.
  - d) To recommend revisions and convene a second meeting of the Thesis Examining Committee to review the thesis and complete the student's examination.
  - e) To rule the thesis (including its examination) unsatisfactory, and therefore, the student fails.

Following the examination, the Chair must inform the student of the outcome of the examination, which of the above alternatives has been adopted, and if other than alternatives "a" or "e," an expected time period in which the process is to be completed.

7. *Pass or Fail:*

- a) The student *passes* if all members of the Thesis Examining Committee accept the thesis (including its examination) as satisfactory.
- b) One or more negative votes constitutes a *failure* of the candidate to meet the thesis requirement. In cases of *failure*, the Thesis Examining Committee must specify in detail and in writing the nature of the deficiencies in the thesis and/or the oral performance that led to *failure*. This statement is to be submitted to the graduate program coordinator, the Dean of Graduate Studies and the student. A second examination may be permitted if the student will be in good standing at the time of the proposed second examination. A second examination requires the approval of the graduate program coordinator and the Dean of Graduate Studies. If the student fails this second examination, or if a second examination is not permitted, the student's admission to the graduate program is terminated.

Any disagreements on the thesis are referred to the Dean of Graduate Studies for resolution.

C. **Submission of the thesis:** See the *UMES Guide to the Preparation of Theses and Dissertations* for the details of this process (available for download at [www.umes.edu/WorkArea/showcontent.aspx?id=27778](http://www.umes.edu/WorkArea/showcontent.aspx?id=27778)).

- a) Two copies of the thesis, in a format approved by the Graduate School, are to be submitted to the Graduate School after final approval of the thesis by the Thesis Examining Committee.
- b) Additional copies may be required by individual programs.
- c) The final approved copies must be submitted to the Graduate School within 3 months of the oral examination for outcomes 6a and 6b above; and within 6 months for outcomes 6c and 6d above. The oral examination may be invalidated and the student required to defend the thesis for a second time should these deadlines be missed, except in extraordinary circumstances acceptable to the Graduate Studies Dean.

## Established Procedures for Conduct of the Doctoral Dissertation Defense

- A. **Establishment of the Dissertation Examining Committee:** The Dissertation Examining Committee is appointed by the Dean of Graduate Studies, in accordance with the policies listed below.

1. *Eligibility:* A student is eligible to defend a dissertation if the student:
  - a) has advanced to Doctoral candidacy;
  - b) has met the graduate program requirements for a dissertation defense
  - c) is in good standing as a graduate student at the University, with a 3.0 cumulative GPA;
  - d) is registered for at least one credit, as applicable (refer to the Graduate School Catalog sub-sections on *Minimum Registration Requirements for Doctoral Candidates and Dissertation Research*);
  - e) has a valid Graduate School-approved Dissertation Examining Committee; and
  - f) if this is the second defense, the defense has been approved by the Graduate School.

The defense shall be held when the student has completed the dissertation to the satisfaction of the student's Advisor. However, a dissertation draft which is not presented in the standard dissertation format, or for which the research and conclusions are incomplete, shall not be considered complete by the Graduate School for purposes of the student's eligibility to defend the dissertation.

2. *The Dissertation:* The ability to do independent research and provide sufficient evidence of scholarship must be demonstrated by an original dissertation on a topic approved by the candidate's program Committee. For publication of the dissertation prior to its defense, refer to the Graduate School Catalog subsection on this subject.
3. *Dissertation Examining Committee Membership:* The Committee must consist of a minimum of five voting members. At least three of them must be regular members of the UMES Graduate Faculty and at least two must be full-time faculty in a UMES academic department unless otherwise appointed by the Dean of Graduate Studies by special permission.

At least one of the five must be a regular member of the Graduate Faculty in a department or graduate program at UMES external to the one in which the student is seeking the degree unless otherwise approved by special permission of the Dean of Graduate Studies. Additional Committee members may be required or invited to serve at the discretion of the program.

Each member of the Dissertation Examining Committee must be a member of the UMES Graduate Faculty; whether in a regular, Associate, or Special Member category, or an approved University System of Maryland Inter-Institutional Graduate Faculty (IIGF) member. An IIGF member may serve as Chair of the Committee.

4. *Nomination of the Dissertation Examining Committee:* Membership on a Dissertation Examining Committee requires nomination by the student's advisor, the concurrence (if required) by the graduate program coordinator in the student's graduate program, and approval by the Dean of Graduate Studies who appoints the Committee. The nomination of a Dissertation Examining Committee should be provided to the Graduate School at least three weeks before the date of the expected dissertation defense. The dissertation

defense cannot be held until the Graduate School approves the composition of the Dissertation Examining Committee. In case of any unavoidable circumstances, a Committee member can be substituted by another graduate faculty member at the request of the Committee Chair and approval by the Dean of Graduate Studies.

5. *Research Assurances:* The following research assurances must be approved prior to the initiation of any dissertation-related research, and the approvals must be provided to the Graduate School at the time the student submits the Nomination of Examining Committee form.
  - a) If the dissertation research involves the use of vertebrate animals, animal use protocols must be approved by the campus Animal Care and Use Committee.
  - b) If the dissertation research involves human subjects, the research must be approved by the campus Institutional Review Board.
  - c) If the dissertation research involves hazardous materials, either biological or chemical, or recombinant RNA/DNA, the research must be approved by the appropriate University committee.

The UMES office of Sponsored Programs is the contact office for guidance on and the processing of research assurances.

6. *Chair:* Each Dissertation Examining Committee will have a Chair (usually the advisor or major professor), who must be a regular member of the Graduate Faculty or, by special permission, has been otherwise appointed by the Dean of Graduate Studies. Dissertation Examining Committees may be co-chaired, if:
  - a) co-advisement was approved at the time of the student's admission to Graduate School, or
  - b) upon written recommendation of the student's advisor, concurrence by the graduate program coordinator (if required), and with the approval of the Dean of Graduate Studies.

At least one of the Co-Chairs must be a regular member of the UMES Graduate Faculty for the Marine-Estuarine-Environmental Sciences (MEES) program.

7. *Representative of the Dean of the Graduate Studies:* Each Dissertation Examining Committee shall have appointed to it a representative of the Dean of Graduate Studies to observe the process. The Dean's Representative should have some background or interest related to the student's research. The Dean's Representative must be a regular member of the UMES Graduate Faculty and from a department or graduate program other than the student's home department. The Dean's Representative is normally one of the five voting members of the student's Committee, unless circumstances warrant that the Dean's Representative be an external appointee, and in these instances, a non-voting member of the Committee.
8. *Special Members:* Individuals who have been approved for Special Membership in the UMES Graduate Faculty may be nominated to serve on Dissertation Examining Committees. However, these individuals must be in addition to the required three regular members of the UMES graduate faculty (see A-3 above) unless otherwise appointed by the Dean of Graduate Studies by special permission.
9. *Service of Former UMES Faculty Members:* Graduate Faculty who terminate employment at UMES (and who do not have emeritus status) retain their status as members of the

Graduate Faculty for a twelve-month period following their termination. Thus, they may serve as members and Chairs (but not as Dean's Representatives) of Dissertation Examining Committees during this twelve-month period if they are otherwise eligible. After that time, they may no longer serve as Chairs of Dissertation Examining Committees, although, if granted the status of Special Members of the Graduate Faculty, they may serve as Co-Chairs (see A-6, above). Professors Emeriti and Associate Professors Emeriti may serve on Dissertation Examining Committees provided they were regular or Associate Members of the UMES Graduate Faculty at the time of retirement. Unless granted special permission by the Graduate Studies Dean, only those with regular membership in the Graduate Faculty can chair Dissertation Examining Committees or serve as the Dean's Representative

## **B. Procedures for the Oral Defense**

1. *Oral defense requirement:* Each Doctoral candidate is required to defend orally his/her Doctoral dissertation in partial fulfillment of the Doctoral degree.
2. *Committee preparation:* Members of the Dissertation Examining Committee should receive the dissertation at least ten working days before the scheduled defense. Should the Committee or program deem it reasonable and appropriate, it may require submission of the dissertation more than ten working days in advance of the defense.
3. *Attendance at the defense:* Oral defenses must be attended by all members of the student's officially established Dissertation Examining Committee as approved by the Dean of Graduate Studies. All defenses must be open to UMES Graduate Faculty and the campus community. Should a last-minute change in the constitution of the Dissertation Examining Committee be required, the change must be approved by the Dean of Graduate Studies in consultation with the graduate program coordinator (if required) and the Chair of the student's Dissertation Examining Committee.
4. *Location of the defense:* Oral defenses must be held in University facilities that are readily accessible to all members of the Dissertation Examining Committee and others attending the defense. The Chair of the Dissertation Examining Committee selects the time and place for the examination, notifies the other members of the Committee and the candidate, and releases the public notice of the defense. Under special circumstances as approved by the Dean of Graduate Studies, and if it can be logistically arranged, the interactive video network or other acceptable electronic medium may be used to accommodate an off-site Committee member. In this case, the Committee member must follow up with a written recommendation to the Committee Chair.
5. *Notice:* Notice of the Doctoral Defense must be publicized in the student's graduate program/department at least five working days prior to the defense.
6. *The Dean's Representative:* The responsibilities of the Dean's Representative include ensuring that the procedures of the oral defense are in compliance with those of the Graduate School and reporting to the Dean of Graduate Studies any unusual problems experienced in the conduct of the defense. The Dean's Representative must be identified at the beginning of the defense.
7. *Invalidation of the Defense:* The Dean of Graduate Studies may void any defense not carried out in accordance with the procedures and policies of the Graduate School. In

addition, upon recommendation of the Dean's Representative, the Dean may rule an oral defense to be null and void.

8. *Student presentation:* The student is permitted to briefly present a summary of the dissertation, emphasizing the important results and giving an explanation of the reasoning that led to the conclusions reached. The floor will then be open for questioning. This presentation is open to the public.
9. *Opportunity for Questioning by Members of the Dissertation Examining Committee:* The Chair invites questions in turn from each member of the Dissertation Examining Committee. The questioning may continue as long as the Dissertation Examining Committee feels that it is necessary and reasonable for the proper examination of the student. This portion of the defense is held in closed session.
10. *Conclusion of the defense:* After questioning of the student has been completed, the Dissertation Examining Committee discusses in closed session whether or not the dissertation (including its defense) has been satisfactory. The Committee has the following alternatives:
  - a) To accept the dissertation without any recommended changes and sign the Report of Examining Committee.
  - b) To accept the dissertation with recommendations for changes, and, except for the Chair, sign the Report of Examining Committee. The Chair will check the dissertation and, upon his/her approval, sign the Report of Examining Committee.
  - c) To recommend revisions to the dissertation and not sign the Report of Examining Committee until the student has made the changes and submitted the revised dissertation for the Dissertation Examining Committee's approval. The Dissertation Examining Committee members sign the Report of Examining Committee if they approve the revised dissertation.
  - d) To recommend revisions and convene a second meeting of the Dissertation Examining Committee to review the dissertation and complete the student's defense.
  - e) To rule the dissertation (including its defense) unsatisfactory, and therefore, the student fails.

Following the defense, the Chair, in the presence of the Dean's Representative, must inform the student of the outcome of the defense, which of the above alternatives has been adopted, and if other than alternatives A or E, an expected time period in which the process is to be completed.

11. *Pass or Fail:*

- a) The student passes if one member refuses to sign the Report, but the other members of the Dissertation Examining Committee agree to sign, before or after the approval of recommended changes.
- b) Two or more negative votes constitute a failure of the candidate to meet the dissertation requirement.
- c) In cases of failure, the Dissertation Examining Committee must specify in detail and in writing the nature of the deficiencies in the dissertation and/or the oral performance that led to failure. This statement is to be submitted to the graduate program coordinator, the Dean of Graduate Studies and the student.
- d) A second defense may be permitted if the student will be in good standing at the time of the proposed second defense. The time limits for the second defense to take place are



no less than six months and no later than twelve months after the first defense. A second defense requires the approval of the student's advisor, the graduate program coordinator (if required) and the Dean of Graduate Studies.

- e) If the student fails this second defense, or if a second defense is not permitted, the student's admission to the graduate program is terminated.

Any disagreements on the dissertation are referred to the Dean of Graduate Studies for resolution.

- C. **Submission of the Dissertation:** See the *UMES Guide to the Preparation of Theses and Dissertations* for the details of this process.

- a) Two copies of the dissertation, in a format approved by the Graduate School, are to be submitted to the Graduate School after final approval of the dissertation by the Dissertation Examining Committee.
- b) Additional copies may be required by individual programs.
- c) The final approved copies must be submitted to the Graduate School within three months of the oral defense for outcomes 6a and 6b above, and up to twelve months for outcomes 6c and 6d above so long as the deadline for outcomes 6c and 6d is within the four year period after admission to candidacy for completion of the degree program. The oral defense may be invalidated and the student required to defend the dissertation for a second time should these deadlines be missed, except in extraordinary circumstances acceptable to the Graduate Studies Dean.

## **Other Graduate School Policies**

### **Petition for Waiver or Partial Waiver of a Regulation**

All policies of the UMES Graduate School have been formulated by the UMES Graduate Council, the governing body of the graduate school, with the goal of ensuring academic quality. These policies must be equitably and uniformly enforced for all graduate students. Nevertheless, circumstances occasionally occur which warrant individual consideration. Therefore, if a graduate student believes that there are compelling reasons for a specific regulation to be waived or modified, the student should submit the Graduate School's Petition form (PDF available for download at [www.umes.edu/assets/0/232/1278/3114/115b44ba-0ccd-4329-be02-94edc44c324d.pdf](http://www.umes.edu/assets/0/232/1278/3114/115b44ba-0ccd-4329-be02-94edc44c324d.pdf)), explaining the facts and issues, which bear on the case. In all instances, the Petition must be reviewed by the academic advisor and the graduate program coordinator, and if the Petition involves a course, by the course instructor. If these officials recommend approval, the Petition is then forwarded to the Graduate Studies Dean for final review and action.

### **Commencement**

Application for Degree (diploma) must be filed with the Office of Admissions and Registration according to deadlines set by that office. If, for any reason, students do not complete the requirements for graduation in the semester for which they have applied for the diploma, they must reapply for it.

Academic regalia are required of all candidates at commencement exercises. Those who so desire may purchase or rent caps and gowns at the campus Follett Higher Education Group Bookstore. Orders must be filed approximately thirteen weeks before the date of commencement, but may be cancelled later if students find themselves unable to complete

the requirements for the degree. Students should consult the Bookstore on the exact dates for filing orders and for cancellation of orders.

## Institutional Policies Governing Students

Graduate students are subject to State, University System and Campus policies governing employees, students and visitors to the campus. By their acceptance of admission and matriculation at UMES, students indicate their willingness to comply with these policies. These policies address such topics as smoking, use of alcoholic beverages, drug abuse, nondiscrimination, sexual harassment, handicapped access, vehicular traffic laws, registration and parking, theft or damage to University property, and federal regulations and compliance governing research and financial assistance/funding and academic honesty.

Students should familiarize themselves with the above policies.

Also particularly relevant are the University System of Maryland *Policy on Faculty, Student and Institutional Rights and Responsibilities for Academic Integrity* and the *UMES Policy and Procedures on the Disclosures of Student Records* (1992), which complies with the Family Educational Rights and Privacy Act. Students should direct specific inquiries and problems to the appropriate campus office.

Consult the annually issued UMES Student Handbook, which is a guide to all aforementioned University policies and academic/administrative policies and procedures applicable to undergraduate and graduate students (where policies and procedures are different for graduate students these are found in the Graduate School Catalog). University services and activities are also found in the handbook. The student code of conduct policy (latest issue of the UMES Student Judicial Manual) applies to graduate students.

## Academic Honesty Policy

The University of Maryland Eastern Shore (UMES) is committed to the values of academic honesty and integrity and the ensuring that these values are reflected in behaviors of the students, faculty, and staff.

UMES is committed to the prevention of academic dishonesty. To reinforce that commitment, information, including definitions and examples of academic dishonesty, will be published in the UMES Student Handbook and the university catalog. The intention of this information is to prevent acts of academic dishonesty. Prevention is the primary goal of the University in general and the Division of Academic Affairs in particular.

When there is evidence that a student has disregarded the University's Academic Honesty Policy, that student will be subject to review and possible sanctions. Students are expected to do their own work and neither to give nor to receive assistance during quizzes, examinations, or other class exercises.

One form of academic dishonesty is plagiarism. Plagiarism is intellectual larceny: the theft of ideas or their manner of expression. Students are urged to consult individual faculty members when in doubt. Because faculty and students take academic honesty seriously, penalties for violation may be severe, depending upon the offense, as viewed by the committee selected by the appropriate Dean to review such matters. The minimum sanction for cases of proven cheating is failure of the course. Instructors will explain procedures for taking tests, writing

papers, and completing other course requirements so that students may understand fully their instructor's expectations.

One of the objectives of UMEs is to promote the highest standards of professionalism among its students. The integrity of work performed is the cornerstone of professionalism. Acts of falsification, cheating, and plagiarism are acts of academic dishonesty, which show a failure of integrity and a violation of our educational objectives; these acts will not be accepted or tolerated. The following definitions and guidelines should be followed:

1. **Falsification** is unacceptable. Falsification includes but is not limited to
  - a. creating false records of academic achievement;
  - b. altering or forging records;
  - c. misusing, altering, forging, falsifying, or transferring to another person, without proper authorization, any academic record;
  - d. conspiring or inducing others to forge or alter academic records.
2. **Cheating** is also unacceptable. Cheating includes but is not limited to
  - a. giving answers to others in a test situation without permission of the tester;
  - b. taking or receiving answers from others in a test situation without permission of the tester;
  - c. having possession of test materials without permission;
  - d. taking, giving, or receiving test materials prior to tests without permission;
  - e. having someone else take a test or complete one's assignment;
  - f. submitting as one's own work, work done by someone else;
  - g. permitting someone else to submit one's work under that person's name;
  - h. falsifying research data or other research material;
  - i. copying, with or without permission, any works, (e.g., essays, short stories, poems, etc.), from a computer hard drive or discs and presenting them as one's own.
3. **Plagiarism** as a form of cheating is also unacceptable. Plagiarism is the act of presenting as one's own creation works actually created by others. Plagiarism consists of
  - a. taking ideas from a source without clearly giving proper reference that identifies the original source of the ideas and distinguishes them from one's own;
  - b. quoting indirectly quoting or paraphrasing material taken from a source without clearly giving proper reference that identifies the original source and distinguishes the paraphrased material from one's own compositions;
  - c. quoting directly quoting or exactly copying material from a source without giving proper reference or otherwise presenting the copied material as one's own creation.

Acts of falsification, cheating, plagiarism, and other forms of academic dishonesty are grounds for failure of a course. The University reserves the right to impose more severe penalties for any of these forms of academic dishonesty. The penalties may include, but are not limited to suspension from the University, probation, community service, expulsion from the University, or other disciplinary action the University believes to be appropriate.

### ACADEMIC DISHONESTY PROCEDURES

In accordance with existing policy in the University Systems of Maryland (USM), students accused of plagiarism and other forms of academic dishonesty will be given due process. When an instructor believes that a student has committed plagiarism or other acts of academic dishonesty, the following steps will be taken:

1. A faculty member who has sufficient reason to believe that a student is guilty of academic dishonesty will notify and subsequently meet with the student within **ten calendar days** from the time the alleged academic dishonesty is discovered.
2. Prior to the initial meeting of the faculty member and the accused student, the faculty member should check the files on academic dishonesty kept in the Office of the Vice President for Academic Affairs to determine whether the student has been previously disciplined for academic dishonesty. The University reserves the right to impose more severe disciplinary action against a student who is a repeat offender or who has previously been found guilty of egregious incidents of cheating.
3. At the initial meeting the student will be given the complete and detailed charges in writing, and an opportunity to respond to the faculty member regarding the charges.
4. If the student wishes, he/she may submit a written response to the charges. This response must be delivered to the aforementioned faculty member within **five calendar days** of the initial meeting.
5. If the student admits to the charge of academic dishonesty, and the offense is his/her first offense, he/she will be asked to sign a statement consenting to the punishment imposed. Consent statements will be filed with appropriate records in the Office of the Vice President for Academic Affairs. For first offenses, the punishment will be failure of the course. If the student refuses to sign the consent form, the faculty member will proceed to the next step in the process.
6. The faculty member will notify the student whether or not the matter will be taken to the next step in the process within **five calendar days** of receiving from the student a written response to the charges. The student shall file his/her written response with the Office of the Vice President for Academic Affairs.
7. If the student does not respond within the time indicated, the faculty member must proceed to the next step in the process. If, upon receiving the written response, the faculty member does not accept the student's explanation, the faculty member is required to send the matter forward to the next level of review.
  - a. If the case is a repeat offense, the faculty member is also required to send the matter forward to the next level of review.
  - b. If the case is not a repeat offense, and the student does not respond within the time indicated, the faculty member must proceed to the next step in the process.
  - c. If the case is not a repeat offense and upon receiving the written response the faculty member does not accept the student's explanation, the faculty member is required to send the matter forward to the next level of review.

8. Once the student has been duly notified of the charges, he/she will not be permitted to drop the course, but will continue as a student, completing and submitting all work required throughout the remainder of the semester.
9. The faculty member will notify the department chair and the Dean of his/her findings, and within **five calendar days** forward to the Dean a written explanation of the circumstances, along with copies of any pertinent evidence.
10. The Dean will review the explanation and any supporting evidence, and may, at his or her discretion, interview the accused student and/or the faculty member, for purposes of clarification and adherence to the University's Academic Honesty Policy. If the matter cannot be resolved at that level to the satisfaction of the faculty member bringing the charges, within **five calendar days** it will then be forwarded to the school's committee on academic dishonesty.
11. A five member committee on academic dishonesty will be appointed by the respective Dean of each school at the beginning of the academic year. It will be comprised of three full-time tenured faculty, one exempt employee of the University, and one junior or senior level student. In the event that the alleged dishonesty occurred on the graduate level, the student member will be a graduate student. The Dean will appoint the chair of the committee. In order for its actions to be official, at least three members of the committee must be present when decisions are made. The verdict will be decided by the majority, in this case two votes of three. If four or more members are present, the majority shall be three or more votes.
12. A faculty member, who has brought or is in the process of bringing charges against a student for academic dishonesty in the current academic year, will not be eligible to serve on the committee. The Dean will appoint a replacement.
13. The committee will meet to review cases and to hear any testimony it considers relevant to the matter on dates requested by the Dean. At the meeting, the student will be allowed the opportunity to appear and respond to the charges, and answer any additional questions from the committee. All proceedings will be tape recorded, and the recording will be entered into the academic dishonesty records maintained in the Office of the Vice President of Academic Affairs. In the event of academic dishonesty allegedly occurring during summer sessions or during final work at the conclusion of a semester, the alleged dishonesty charge will be reviewed during the committee's first meeting in the fall. In the interim, the student will receive a grade of "I."
14. The committee review shall be informal, with neither party represented by an advocate. Witnesses may be asked and/or permitted to make a statement to the committee if the committee is informed prior to the meeting. The meeting shall not be open to the public. If the student wishes he or she may have an associate present for consultation purposes only. Lawyers, parents, or any form of professional advocate may **not** serve as an associate.
15. The committee shall meet privately at the close of the meeting to decide whether a majority believes a preponderance of evidence supports the allegation of falsification, cheating or plagiarism.

16. If the allegation is sustained, the committee will also determine whether the standard minimum penalty of failure in the course shall be accompanied by an additional penalty or penalties. If the allegation is not sustained, the student is not guilty of violating the Academic Honesty Policy.
17. The records of the proceedings , both written and electronically recorded, are to be kept in the files on academic dishonesty maintained in the Office of the Vice President for Academic Affairs.
18. The committee shall notify, in writing, the student, the instructor, and the Dean within **ten calendar days** of having reached its decision. The decisions of the committee may be appealed on procedural grounds only. All appeals should be made to the Vice President for Academic Affairs, who will then have the following options:
  - a. affirm the decision and the penalty imposed by the committee;
  - b. affirm the decision, but amend the penalty; or
  - c. vacate the decision and order a new hearing with a different committee
19. After a careful review of the record of the proceedings, the Vice President for Academic Affairs will render the final decision of the University.

# SELECTED STUDENT SERVICES AVAILABLE TO GRADUATE STUDENTS

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## Office of the Registrar

[www.umes.edu/Registrar](http://www.umes.edu/Registrar)

The Office of the Registrar is the official University repository of academic records. The services listed below are representative, but not limited to those offered by the Registrar's office.

- ☐ Issuance of Transcripts
- ☐ Enrollment Verifications
- ☐ Withdrawal from the University
- ☐ Graduation Audits
- ☐ Credit by Examination
- ☐ Coordination of Cooperative Programs
- ☐ Change of Major
- ☐ Degree Certification
- ☐ Course Withdraw
- ☐ Inter-Institutional Enrollment

## Contact Information:

Student Development Center  
Suite 1120, 1st Floor

Phone: 410-651-6413 / 410-651-6414

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## Health Center

[www.umes.edu/studenthealth](http://www.umes.edu/studenthealth)

The Charles R. Drew Student Health Center assists students in maintaining their physical well-being by providing basic health care services such as treatment for acute conditions, immunizations and screenings.

All registered students, including graduate, transfer and international students, regardless of number of credit hours being taken, are required to provide a completed health history form and proof of up-to-date immunization status for measles, mumps, rubella (MMR) and tuberculosis (TB) prior to registering for and/or attending classes. Students living in campus housing must also meet the meningitis requirement.

Registration blocks will be placed on students who have not submitted the required documents. This will prevent students from registering for and/or attending classes until the records are received and processed. To avoid delays, students should submit the records as soon as possible.

The deadlines for submission are: August 1 for the Fall semester and January 1 for the Spring semester.

Students who encounter difficulty obtaining documentation should contact the Student Health Center for assistance.

A University-sponsored health insurance plan is available. Full-time international students (undergraduate and graduate) are automatically enrolled in the insurance plan unless they opt out. To opt out of the University health insurance plan, students must sign the insurance waiver in the Student Health Center and present proof of current valid health insurance coverage. Waivers must be completed by September 7 in the Fall and by February 7 in the Spring. If no waiver is completed, the student's account will be billed for insurance at the current rate.

Domestic graduate students (full or part-time) are eligible for the plan but must enroll directly. Copies of the insurance brochure may be obtained from the Student Health Center or accessed online at <http://njicservices.com/umes.htm>. Students with questions about using the insurance should contact the Health Center staff.

**Contact Information:**

Charles R. Drew Health Center  
1 Backbone Road  
Phone: 410-651- 6597

**Hours of Operation**

Monday - Friday

8:00 am - 11:00 am (walk-in)

1:00 pm - 4:00 pm (by appointment)

*For medical emergencies after these hours, students may seek assistance through Public Safety or Residence Life staff members.*

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**University Counseling Services**

[www.umes.edu/counselingcenter](http://www.umes.edu/counselingcenter)

Counseling Services serves the UMES enrolled students who seek assistance with developmental and mental-health related concerns such as individual counseling, group counseling, couples counseling, psychiatric services, and referral services. The Center also serves the broader campus community by offering a wide variety of programs in direct support of the University's mission including workshops on improving study skills and communicating effectively. Counseling Services is composed of professional counselors and consulting psychiatrists who have years of experience working with college-aged students. The staff provides a confidential atmosphere and a safe environment in which students may explore and resolve issues of concern.

All services are free of charge.

**Contact Information:**

Student Development Center  
Second Floor, Suite 2260  
Phone: 410-651-6449

**Hours of Operation:**

Monday through Friday

8:00 a.m. - 5:00 p.m.

*For after hour emergencies, Counseling Services may be reached through the University Police at 410-651-3300.*

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## **Student Services Center**

[www.umes.edu/StudentActivities](http://www.umes.edu/StudentActivities)

The Student Services Center (SSC) offers facilities and offices for registered student organizations at UMES. The SSC and the Office of Student Activities offer cultural, recreational and educational programs, events and activities for students, faculty and staff, as part of curricular program offerings. The Office also provides events management planning services for the University community. Programs and activities are designed for the education, development and enjoyment of all students. Lectures, movies, cultural forums, theatre arts, leadership development workshops, meetings, intramural sports and recreations are some of the many programs and activities sponsored in the Center and across the campus.

The Student Services Center is designed as a "one-stop-shop" for student needs. The building houses a variety of departments and services for students, including:

- a. the Office of Student Life and Enrollment Management;
- b. the Office of Campus Life;
- c. Career Services;
- d. Auxiliary Enterprises;
- e. the Student Government Association;
- f. International Student Programs;
- g. the campus post office;
- h. a bookstore;
- i. a game room with both billiards and a bowling center;
- j. a dining hall, a snack bar and lounges;
- k. a theatre and a ballroom;
- l. a resource center;
- m. an ATM (sponsored by the State Employees Credit Union of Maryland (SECU).);
- n. the Hawk Center.

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## **Career Services Office**

<http://www.umes.edu/careers>

The Office of Career Services assists graduate and undergraduate students as well as alumni with all aspects of career development. The staff provides individualized career counseling. Emphasis is placed on the preparation of resumes, interviewing techniques and other job search strategies.

The Office maintains a computerized job listing of current employment, employment directories and lists of prospective employers and many other career related resources. Referrals and on-campus interview services are also available to students and alumni registered with the Office. The Office also supplies information about internships, summer jobs and also programming for graduate/scholarship preparation and assistance.

The Office provides information about testing for the Graduate Record Examinations (GRE), the Law School Admission Test (LSAT), the Professional Assessments for Beginning Teachers (PRAXIS) and the College Level Examination Program (CLEP).

**All students are strongly encouraged to register with the Office prior to graduation in order to establish a Credential Portfolio file and to become eligible for the services provided by the Office.**

The Career Services Office also administers the Cooperative Education program, which has opportunities for graduate students. Interested students should contact the Office for details.

Contact Information:

Student Service Center, Suite 2158

Phone Number: 410-651-6447

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**Office of Services for Students with Disabilities**

[www.umes.edu/AccSupport/Default.aspx?id=15746](http://www.umes.edu/AccSupport/Default.aspx?id=15746)

The Office maintains a comprehensive support network for students with disabilities. The Office is available for assistance with:

- a. information and referral on vocational rehabilitation and other community agencies or available resources;
- b. pre-admission and campus visits;
- c. specialized orientation to campus as needed;
- d. vocational counseling and career guidance referral;
- e. facilitating a positive work relationship between faculty, staff, and students with disabilities;
- f. information on classroom accommodations;
- g. advocacy.

Contact information:

Phone: 410-651-6461

Email: [djoseph@umes.edu](mailto:djoseph@umes.edu)

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**Academic Support Services**

[www.umes.edu/accsupport](http://www.umes.edu/accsupport)

Consult the Academic Support Services Office for assistance with writing skills.

Contact Information

Center For Access and Academic Success

Student Development Center, Suite 2200

Phone: 410-651-6457

Email: [CAAS@umes.edu](mailto:CAAS@umes.edu)

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**Athletic Center**

The William P. Hytche Athletic Center includes an Olympic-size swimming pool, NCAA regulation indoor track, state-of-the-art exercise and fitness center, racquetball courts, dance studio, multi-sports arena, and academic classrooms.

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## **Computing Resources**

[www.umes.edu/IT/Computing.aspx?id=1330](http://www.umes.edu/IT/Computing.aspx?id=1330)

There are over sixteen computer departmental laboratories located in 10 buildings on campus. Additionally there is the Waters Hall Computing Center which has 5 computer laboratories, one of which is dedicated for graduate student use.

### Contact Information:

Academic Computing Center, Waters Hall

Email: [pataylor@umes.edu](mailto:pataylor@umes.edu)

### Hours of Operation:

Monday-Thursday from 8:00 am. to 11:45 pm

Fri. from 8:00 am. to 4:15 pm

Sat. from 8:00 am. to 4:15 pm

Sun. from 2:00pm to 9:45 pm

# **GRADUATE RESEARCH & INSTRUCTION RESOURCES**

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## **The University Library Services**

[www.umes.edu/fdl](http://www.umes.edu/fdl)

The Frederick Douglass Library houses a multiplicity of print and non-print resources to support the mission and academic programs of the University. The collection includes 213,143 volumes, 601 current periodical subscriptions, 35,773 bound periodicals and over a half million microfiche and microfilm collections. As a member of USMAI (University System of Maryland and Affiliated Institutions) consortium, the Library is affiliated with the University's eleven campuses and thirteen libraries for the purpose of sharing library resources. The integrated, comprehensive library system, ALEPH, makes it possible for patrons to have 24/7 access to USMAI library collections and electronic resources. These collections and resources include the library catalog and 124 research databases including many full text journals, books and newspapers.

The Library offers a library instruction program on three levels as well as a one credit Information Literacy course (LIBR100) to support the University's curriculum and the research needs of the students, faculty and staff. They are as follows:

1. **Library Orientation:** The most basic session that includes an introduction to a multidisciplinary database such as Academic Search Premier, the online catalog, a tour of the Library and available Library services.
2. **Subject Orientation:** Topic related instruction, which consists of database demonstrations related to the subject and an overview of specialized reference resources.
3. **Professional level courses:** These are designed for faculty and/or graduate level research. Instruction can be given for any level at the request of the faculty and/or student.

A very competent staff is also available to assist with information needs.

### Contact Information:

Frederick Douglass Library  
11868 Academic Oval

### Hours of Operation:

Monday - Thursday: 8:00am - midnight

Friday: 8:00am - 5:00pm

Saturday: 10:00am - 7:00pm

Sunday: 3:00pm - 12:00am

*Computer Labs close 15 minutes prior to the closing time.*

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## **Special Research Resources**

The UMES campus is within a 2½ hour drive of one of the greatest concentrations of research facilities and intellectual talent in the nation in the Washington DC–Baltimore–Northern Virginia corridor. Libraries and laboratories, serving virtually every academic discipline, are within easy commuting distance. Opportunities abound for the exchange of ideas, information, and scholarship. Many of the libraries and laboratories are open to qualified UMES graduate students and others by special arrangement.

1. The federal sector possibilities for faculty and graduate student collaboration include the USDA's Agricultural Research Center (Beltsville, Maryland); the National Institutes of Health (for biomedical and behavioral research, headquartered in Bethesda, Maryland); the National Institute of Standards and Technology (Gaithersburg, Maryland); and the Naval Research Laboratory (Washington DC), among others.
  2. The State's concern with the commercial and recreational use of the Chesapeake Bay, as well as its preservation, has been a focus of the University of Maryland Center for Environmental Studies (CES). Two of the CES research facilities are located on the Chesapeake Bay, one of which is in Cambridge, Maryland, an hour away from UMES. UMES MEES program students may use CES faculty on their research committees, and access CES facilities and equipment.
  3. In addition to the UMES farm, graduate students in Agriculture have access to the research farms and facilities of the Research and Education Centers of the Maryland Agricultural Experiment Station/Cooperative Extension Service. The UMES Agricultural Research Program is a part of the Maryland Agricultural Experiment Station.
  4. The University System of Maryland jointly participates in the Chesapeake Research Consortium, Inc., a wide-scale environmental research program, with Johns Hopkins University, Virginia Institute of Marine Science and the Smithsonian Institution. The consortium coordinates and integrates research on the Chesapeake Bay, and is compiling a vast amount of scientific data to assist in the management and control of the area. Each participating institution draws on faculty expertise in a diversity of disciplines. The consortium provides research opportunities for UMES faculty and graduate students.
  5. The University of Maryland is among a select group of US universities and colleges to have attained the US Department of Commerce's designation as a Sea Grant College. The Maryland Sea Grant College, housed at the University of Maryland College Park campus, is a statewide program in marine research, education and outreach, focused primarily on the Chesapeake Bay.
  6. UMES is a member of the Maryland Space Grant Consortium in partnership with, Towson University, Morgan State University, the Johns Hopkins University, and the US Naval Academy.
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### **The UMES Office of Sponsored Research and Programs**

[www.umes.edu/OSP](http://www.umes.edu/OSP)

The UMES Office of Sponsored Research and Programs (OSRP) assists faculty involved in graduate research and instruction by helping them in the preparation and submission of proposals, and in the administration of subsequent grant and contract awards from federal, state and private sponsors.

OSRP can be helpful to graduate faculty and/or graduate students in:

- a. identifying potential funding sources;
- b. maintaining contacts with potential sponsors;
- c. assisting with proposal development and the processing of proposals to sponsors;

- d. coordinating sponsor-required compliance review functions (e.g., for animal welfare, human subjects, biological and chemical hazards); and
- e. monitoring grant and contract activities to ensure that project expenditures are within the regulations and policies of the University System of Maryland, the State of Maryland, and the Federal Government.

OSRP assists with the review of financial support and other resources available for graduate students on specific sponsored projects of UMES faculty.

Contact Information:

Office of Sponsored Research and Programs

1120 Early Childhood Research Building

Phone: 410-651-6107

Email: Catherine Bolek, Director - [cbolek@umes.edu](mailto:cbolek@umes.edu)

Hour of Operation:

Monday through Friday, 8:00am through 5:00pm.

# GRADUATE DEGREE PROGRAMS BY SCHOOL AND DEPARTMENT

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## School of Agricultural and Natural Sciences

### DEPARTMENT OF AGRICULTURE, FOOD AND RESOURCE SCIENCES AND HUMAN ECOLOGY

- Food and Agricultural Sciences

### DEPARTMENT OF AGRICULTURE, FOOD AND RESOURCE SCIENCES

- Food Science and Technology

### DEPARTMENT OF NATURAL SCIENCES AND INTERDEPARTMENTAL

- Chemistry
  - Marine-Estuarine-Environmental Sciences
  - Professional Science Master's
  - Toxicology
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## School of the Arts and Professions

### DEPARTMENT OF CRIMINAL JUSTICE

- Criminology & Criminal Justice

### DEPARTMENT OF EDUCATION

- Master of Arts in Teaching
- Counselor Education
- Special Education
- Education Leadership

### DEPARTMENT OF SOCIAL SCIENCES

- Organizational Leadership
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## School of Business and Technology

### DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE

- Applied Computer Science

### DEPARTMENT OF TECHNOLOGY

- Career and Technology Education
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## School of Pharmacy and Health Professions

### DEPARTMENT OF PHYSICAL THERAPY

- Physical Therapy

### DEPARTMENT OF PHYSICIAN ASSISTANT

- Master of Medical Science in Physician Assistant

### DEPARTMENT OF REHABILITATION

- Rehabilitation Counseling

### SCHOOL OF PHARMACY

- Pharmaceutical Sciences
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# **University of Maryland Eastern Shore Graduate Degree Programs & Courses**

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# SCHOOL OF AGRICULTURAL AND NATURAL SCIENCES

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[www.umes.edu/SANS](http://www.umes.edu/SANS)

## Departments of Agriculture and Human Ecology

### **Degrees Offered**

Master of Science (M.S.), Food and Agriculture Sciences

Doctor of Philosophy (Ph.D.), Food Science and Technology

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### **M.S., Food and Agriculture Sciences**

#### **Objectives of the Program**

The overall objective of the program is to provide the State of Maryland, the Eastern Shore region and the nation with persons possessing the M.S. degree who have the knowledge and skills necessary to fill critical employment needs in scientific, technological and economic areas related to food & agriculture. Specific objectives of the program:

- ☐ To provide students with competencies in research and scientific knowledge needed for gainful employment in the Food and Agricultural Sciences.
- ☐ To provide in the land-grant tradition, a quality education with research training at the Master's level within a framework of holistic and interdisciplinary agricultural science technology.
- ☐ To recruit minorities and women to pursue careers in agricultural professions where they have traditionally and historically been under-represented.
- ☐ To assist students in developing their skills in problem solving, analytical thinking, communication and leadership.

#### **Description of the Program**

The Departments of Agriculture, Food and Resource Sciences and Human Ecology offer a graduate program leading to the degree of Master of Science (M.S.) in Food and Agricultural Sciences (FASC). Concentrations include: Agricultural Economics, Agriculture and Extension Education, Animal and Poultry Science, Food and Nutrition, Natural Resources Science and Plant and Soil Science. In typical situations, the prerequisite to graduate work is the completion of a curriculum substantially equivalent to that required of undergraduate students enrolled in the Departments of Agriculture, Food and Resource Sciences and Human Ecology at UMES. A student may qualify for graduate study, however, even though his/her undergraduate degree has been earned in a discipline other than agriculture or human ecology. Supporting or prerequisite work may be required, depending upon the student's background and area of interest. A minimum cumulative grade point average of 3.0 (A=4.0) is required for Regular Admission. A student with a grade point average of 2.75 may be admitted on a provisional basis. Graduate Record Examination (GRE) scores (general test only), three letters of recommendation and a completed application form are required of all applicants. Foreign students must take the Internet Based Test (IBT) TOEFL and score a minimum of 80/120.

The program offers a thesis or non-thesis option for completion of degree requirements. The

thesis option is designed for students who wish to conduct a research project and is required of all students holding graduate research assistantships. Students are required to complete a minimum of 24 hours of course work and 6 hours of thesis credits for a total of 30 hours. The non-thesis option is designed for students who do not wish to complete a thesis research project. Students who choose this option must complete a minimum of 36 hours of course work which includes a "creative component" (e.g., scholarly paper).

Each student is assigned an advisor/ major professor according to his/her area of concentration. Major professors may be either regular or associate members of the UMES Graduate Faculty. The student, in consultation with the major professor, selects his/her Graduate Committee no later than the end of the second semester following enrollment. Each student's program of study is planned in conjunction with the major professor and Graduate Committee. For additional information on completion of degree requirements, students should consult the booklet, *Guidelines for the Graduate Degree Programs in Food and Agricultural Sciences and Food Science and Technology*. All students, regardless of the area of concentration or program option chosen, must maintain an overall 3.0 grade point average, complete degree requirements within 5 years of initial enrollment and pass a final oral examination.

### **Structure of the Program**

#### Core courses

Research Methodology	3 credits
Statistics	3 credits
Seminar	Three 1-credit courses

#### Areas of Concentration

- Agricultural Economics
- Agriculture and Extension Education
- Animal and Poultry Science
- Food and Nutrition
- Natural Resources Science
- Plant and Soil Science

#### Thesis Option - Minimum of 30 credit hours

- Core courses – 9
- Concentration courses – 12
- Electives – 3
- Thesis – 6

#### Non-Thesis Option - Minimum of 36 credit hours

- Core courses – 9
- Concentration courses – 18
- Electives – 6
- Creative Component – 3

### **Application Deadlines**

- Fall Semester - April 15
- Spring Semester - October 30
- Summer Sessions - April 15

## **Research Activities**

Faculty in the Departments of Agriculture, Food and Resource Sciences and Human Ecology conduct basic and applied research in each of the concentration areas.

Annual appropriations by the National Institute of Food and Agriculture (NIFA)/USDA and extramural grants support research activities by faculty and graduate students. Faculty in the Departments of Agriculture, Food and Resource Sciences and Human Ecology maintain close working relations with faculty at the University of Maryland College Park and other 1862 and 1890 land-grant institutions, the Maryland Extension Service and the Agricultural Experiment Station. A number of UMES faculty have access to and utilize facilities of the various units that comprise the Agricultural Experiment Station. Scientists with agricultural expertise from other University System of Maryland campuses may serve on graduate committees for students enrolled in the program. Faculty, staff and students also collaborate with scientists from USDA, as well as from universities outside the University System of Maryland.

## **Facilities and Equipment**

Faculty in the Departments of Agriculture, Food and Resource Sciences and Human Ecology maintain office space in Trigg Hall, the Crop and Soil Science Research Building, the Poultry Science Research Building, the Richard A. Henson Center, and the Food Science and Technology Building.

Several laboratories are fully equipped with instrumentation for both basic and applied research. These laboratories are located in the Crop and Soil Science, Food Science and Technology, Henson Center, and Trigg Hall buildings and accommodate research efforts in agronomy, biotechnology, food safety and quality, global information systems, host-insect interactions, plant genetics and breeding, soil science, plant pathology, plant-environment interactions, and water quality and nutrient management.

The UMES teaching and research farm possesses over 300 tillable acres for crop use. Animal facilities include a totally confined 60-sow farrow-to-finish swine unit, and research broiler houses with capacities of up to 24,000 birds per house..

## **Description of Courses**

*(NOTE: Credit Hours are given in parentheses)*

### Core Courses

*(All students in the program are required to take these courses.)*

#### *AGSC 600, 601, 602 Agricultural Sciences Seminar (1)*

Students report on and discuss recent literature and current investigations relative to food and agricultural sciences and preparation of reports on selected topics. Repeatable credit. Minimum of three (3) credit hours required.

#### *AGSC 605 Statistics in Agricultural Research (3)*

Emphasis is placed on techniques and application of statistical and experimental design, data acquisition, analysis, interpretation and presentation as it applies to the agricultural sciences.

#### *AGSC 691 Research Methodology in the Agricultural Sciences (3)*

Students will learn the basic principles of research methodology. Emphasis will be placed on techniques used in identifying problems, forming hypotheses, constructing and using data-

gathering instruments, designing research studies, and employing statistical procedures to analyze data.

*AGSC 799 Master's Thesis Research (1-6)*

Agricultural Economics Courses

*AGEC 423 Marketing Agricultural Products (3)*

Discussions in this course emphasize characteristics of the demand for and supply of farm products, alternative marketing channels, services and costs involved in marketing.

*AGEC 453 Agricultural Finance (3)*

Agricultural finance in farm firms and financial institutions is studied, emphasizing financial reports and analysis, liquidity and risk. Also studied are the use of credit and other financial alternatives to acquire control of farm resources, credit sources and acquisition of capital, and decision-making.

*AGEC 463 Agricultural Policy (3)*

This course explains current policy issues, policy instruments and choices in US agriculture. It also describes the economic characteristics and problems of agriculture, evolution and significance of agricultural policies, the international dimension and domestic policies that affect agriculture.

*AGEC 613 Quantitative Methods in Agricultural Economics (3)*

The course addresses formulation, estimation, and testing of economic models, interaction between economic problems and specification of econometric models.

*AGEC 623 Advanced Agricultural Marketing (3)*

Emphasis in this course is placed on marketing theory, market structure conduct and performance, economics of control, interregional trade theory, governmental regulation and policy, and bargaining in agricultural markets.

*AGEC 633 Advanced Agricultural Price Analysis (3)*

Topics in this course include demand and price structures, price discovery, time series and agricultural price research methods, techniques for evaluating marketing behavior, market legislation and market development.

*AGEC 653 Advanced Agricultural Finance (3)*

Financial structure of agriculture, firm financial planning and management, financial intermediation in agriculture and agricultural finance in developing countries are the topics that are discussed in this course.

*AGEC 663 Agricultural Policy and Rural Resource Development (3)*

This course focuses on current issues in agricultural policy and rural resource development, application of welfare criteria and economic analysis to agriculture, food and rural development problems and policies.

*AGEC 680 Individual Studies in Agricultural Economics (1-3)*

The student is required to produce a scholarly paper, which provides a critique of a selected topic in agribusiness related areas. This can be used to satisfy the "creative component" requirement for students pursuing the non-thesis option.

*AGEC 713 Economics of Agricultural Production (3)*

Students learn about the use and application of production economics in the agricultural industry through graphical and mathematical approaches.

*AGEC 773 Seminar/Group Study in Research Methods (3)*

Students will be required to develop and present a thesis prospectus for this course, to include principles and application of the scientific method in developing a research proposal, data collection management and analysis, and thesis writing.

*AGEC 813 Advanced Microeconomic Theory (3)*

This is an advanced treatment of the theory of prices and markets. Discussions focus on analysis of the theory of the household and the firm, concepts of general equilibrium and welfare economics, and principles of efficient and equitable allocation of resources.

*AGEC 814 Advanced Macroeconomic Theory (3)*

This is an advanced treatment of an economy's overall performance, including fluctuations in economic activity, causes of inflation and unemployment, impact of fiscal and monetary policies on the economy's aggregate output.

Agriculture and Extension Education Courses

*AEED 423 Extension Education (3)*

The course focuses on the agricultural extension service as an educational agency. Students will learn the history, philosophy, objectives, policy, organization, legislation and methods used in extension work.

*AEED 426 Development and Management of Extension Youth Program (3)*

This course is designed for present and prospective state leaders of extension youth programs. It emphasizes program development, principles of program management, leadership development and counseling, science, career selection and citizenship in youth programs, field experience in working with low income families' youth, and urban work.

*AEED 497 Conservation of Natural Resources (3)*

Students learn about the state's natural resources: soil, water, fisheries, wildlife, forests and minerals. Natural resources problems and practices are covered. This course involves extensive field study. Methods of teaching conservation are included.

*AEED 600 Seminar I (1)*

This course focuses on reports and discussion of recent literature and current investigations relative to the agricultural sciences.

*AEED 625 Administration and Supervision of Agriculture Programs (3)*

Students learn about management principles and practices of planning, organizing, directing, staffing and evaluating as applied to administration and supervision of programs in agriculture.

*AEED 626 Program Development in Agriculture and Extension Education (3)*

Students learn about concepts in program planning and development and the framework for analysis of programs and their implementation in the education and extension services.

*AEED 627 Program Evaluation in Adult & Continuing Education (3)*

This course is designed for those who provide adult instruction in community colleges, university outreach programs, businesses and industries. This course will help learners to become more effective in evaluating educational programs, and will build upon current levels of instructional or administrative expertise in the adult education field.

*AEED 630 Teaching – Learning in Adult & Continuing Education (3)*

This course deals with theory, principles and procedures of teaching and learning in adult and continuing education.

*AEED 663 Development Leadership (3)*

This course focuses on principles and practices of leadership development. The organization, implementation, and evaluation of individual and group leadership development in agriculture are covered.

*AEED 691 Research Methodology in the Agricultural Sciences (3)*

This course focuses on principles, applications and techniques used in identifying problems, forming hypotheses, developing and using data gathering instruments, designing research studies, employing statistical procedures to analyze data, and organizing materials for thesis writing.

*AEED 699 Special Problems (1-3)*

Emphasis on a specific topic within the student's area of interest is the focus of this course. Choice of topic, hours and credit must be made in consultation with the instructor prior to registration. A written report and an oral presentation of the topic studied will be required.

*AEED 789 Special Topics (1-3)*

The course may be repeated to a maximum of nine credits provided content is different each offering.

*AEED 798 Seminar in Research (1-8)*

Students learn about problems in the organization, administration and supervision of the several agencies of extension and/or agricultural education. This course is repeatable to a maximum of eight credit hours.

*AEED 799 Master's Thesis Research (1-6)*

Animal and Poultry Science Courses

*ANPT 424/624 Animal and Avian Health and Diseases (4)*

The study of parasitic, viral, bacterial and protozoal diseases of mammalian and avian species will be covered. Methods of disease prevention, control and eradication will also be discussed.

*ANPT 611 Poultry Diseases and Hygiene (4)*

Students will study the parasitic, viral, bacterial and protozoan diseases of domestic poultry. Methods of disease prevention, control and eradication will also be discussed.

*ANPT 614 Advanced Animal Avian Physiology (4)*

This course covers an in depth presentation of major organ systems and their interaction in the maintenance of homeokinesis.

*ANPT 621 Applied Poultry Nutrition (3)*

Students will learn how to apply the basic principles of nutrition to the avian species. Nutritional requirements of poultry, deficiency diseases, least cost formulations and effects of environment on avian nutrition will be discussed.

*ANPT 622 Analytical Laboratory Methods (2)*

The application of analytical laboratory techniques used in biomedical research will be explored.

*ANPT 634 Advanced Animal and Avian Diseases (4)*

Students will study the nutritional and metabolic diseases and the isolation and cultivation of macro-and microscopic parasites inclusive of gross and microscopic pathology.

*ANPT 642 Advanced Non-Ruminant Nutrition (3)*

The application of basic principles of nutrition to commercial non-ruminant animals will be discussed. Factors affecting nutritional requirements, effects of environment on nutrition and least cost formulations will also be covered.

*ANPT 680 Individual Studies in Animal and Poultry Science (1-3)*

Student is required to produce a scholarly paper, which provides a critique of a selected topic in Animal and Poultry Science. This can be used to satisfy the "creative component" requirement for students pursuing the non-thesis option.

Food and Nutrition Courses

*NUTD 600 Pre-professional AP-4 Practice Program in Dietetics (1-5)*

This is an in-service course restricted to dietitians.

*NUTD 640 Nutrition & Human Development (3)*

Course covers the role of nutrients in physiological systems and biochemical processes as related to the perspective of human growth and development across the lifespan.

*NUTD 642 Nutritional Counseling (3)*

Assessment, planning, implementation and evaluation of nutritional counseling and educational techniques are examined.

*NUTD 644 Special Problems in Nutrition (3)*

This is an assessment of nutritional status and needs of various groups such as the aged, infants and children and adolescents. Emphasis is placed on development and management of nutrition programs to meet specific needs through the actions of community agencies.

*NUTD 646 Clinical Nutrition (3)*

Metabolism in disease and the adaptation of diet in the treatment or prevention of disease are studied.

*NUTD 650 Intermediary Metabolism (3)*

The course covers the major routes of carbohydrates, lipids and protein metabolism with particular emphasis on metabolic shifts and their detection and significance.

#### *NUTD 654 Nutritional Biochemistry (4)*

The course reviews recent developments in nutritional sciences designed to acquaint students with laboratory procedures in nutritional biochemistry and physiology, including the identification and measurements of nutrients and their metabolites in foods, tissue and body fluids and human and animal experiments in nutrition. Special emphasis is placed on the relationship between biochemistry and nutrition.

#### *NUTD 656 Nutrition Laboratory (1-3)*

Digestibility studies are conducted with ruminant and monogastric animals. The proximate analysis of various food products and feeding trials are used to demonstrate classical nutritional deficiencies in laboratory animals.

#### *NUTD 660 Protein and Amino Acids in Nutrition (3)*

This is an advanced study of the roles of amino acids in nutrition and metabolism. Protein digestion, absorption, anabolism, catabolism and amino acid balance are examined.

#### *NUTD 664 Vitamin and Mineral Metabolism (3)*

This is an advanced study of the fundamental role of vitamins in nutrition, including chemical properties, absorption, metabolism, excretion and deficiency syndromes. Basic nutritional data on minerals are presented.

#### *NUTD 680 Individual Studies in Food & Nutrition (1)*

The student is required to produce a scholarly paper which provides a critique of a selected topic in Food and Nutrition. This can be used to satisfy the "creative component" requirement for students pursuing the non-thesis option.

### Natural Resources Science Courses

#### *NRES 683 Principles of Watershed Management (3)*

This is a course designed to acquaint students about how watersheds work, how they are managed, and how their management affects the ecology of the Chesapeake Bay, Coastal Bays and the Atlantic Ocean. Prerequisites: CHEM 111, CHEM 113, BIOL 111, BIOL113, SOIL 203, AGRN 423; or consent of instructor.

#### *NRES 404/BIOL 404 Conservation Biology (3)*

This course is a multi-disciplinary approach to conservation of natural resources. Course topics examine basic genetic and ecological principles, importance of biodiversity, concept of island biogeography as it applies to the course topic, endangered species conservation, and the value of protected areas. Strong emphasis will be placed on sociological, economic, and political components of conservation. Students will prepare three written reports on current conservation issues. Prerequisites: BIOL 111, BIOL 113, BIOL 112, BIOL 114, BIOL 402 or consent of instructor.

#### *NRES 473/673 Ornithology (3)*

This course covers general biology, taxonomy, and natural history of birds, with an emphasis on North American families. Cross-listed with NRES 473. Prerequisites: BIOL 111, BIOL 113, BIOL 112, BIOL 114 or consent of instructor.

#### *AGRN 483 Principles of Geographic Information Systems (3)*



This course is designed to provide students with an overview of the applicability and use of Geographic Information Systems (GIS); students will become competent with ArcView®, a GIS software package from Environmental Systems Research Institute (ESRI), Inc. Students will also learn the basics of data management, data accuracy, spatial analysis, and data presentation.

*ANPT 403/NRES 403 Advanced Aquaculture (3)*

The course covers the fundamentals of commercial fish and other marine animal production, including principles of pond and tank production, management, nutrition and disease.

*BIOL 431 Mammalogy (4)*

This course is a detailed investigation of mammal biology, with emphasis on special physiological and ecological adaptations, ecological specializations and biogeography of mammals.

*ENVS 684 Natural Resource Management (3)*

Discussions revolve around the availability, use, abuse, depletion and pollution of various natural resources humans need for survival. The cost-benefit analyses and systems management concepts for natural resource conservation enabling us to save the “earth” for future generations will be addressed. Prerequisites: B.S. in Biology, Chemistry, Environmental Science, Agricultural Sciences or consent of the instructor.

*BIOL 688F Fish Physiology (1-4)*

This is an overview of fish physiology, which fishery biologists and others can supplement with readings in current texts, reviews and research articles. Applicable points of general and comparative physiology are included. Summaries of important anatomic considerations are included where relevant, but the course is primarily for those who have already completed courses in general physiology, chemistry, biochemistry and fish anatomy. It is an IVN offered course.

*CHEM 670 Advanced Biochemistry (3)*

The course covers the classification, chemistry and metabolism of protein, amino acids, carbohydrates and lipids. Prerequisite: One semester of Biochemistry.

*NRES 799 Master's Thesis Research (1-6)*

Plant and Soil Science Courses

*AGRI 615 Advances in Plant Genetics & Breeding (3)*

Discussion of special topics in genetics and breeding for resistance to pest and other stress factors are covered.

*AGRI 625 Plant, Soil-Water Relationships (3)*

This course involves a study of soil biology, ecology, root morphology and anatomy affecting mineral nutrition and plant-water relations.

*AGRI 638 Advanced Horticultural Crop Production (3)*

Physical, chemical and biological factors affecting horticultural crops will be covered. Emphasis will be placed on post-harvest physiology.

*AGRI 684 Recombinant DNA Technology (3)*

This is a laboratory course to introduce the basic principles of gene cloning, give essential background on working with *E. coli*, utilize different cloning systems and employ methods utilized for DNA sequencing.

*AGRN 423/653 Soil Fertility (3)*

This course provides an in-depth knowledge of relationships of soil mineralogy, texture, organic matter and pH to soil fertility. The use of organic and commercial fertilizers in crop production, and their effects on the environment are emphasized and explored.

*AGRN 623 Advanced Soil Chemistry (3)*

This course provides an in-depth knowledge of clay-mineral properties and use of x-ray diffraction and electron micrographic analysis in their identification. The impact of clay-colloid chemistry in everyday life and special topics in soil chemistry related to clays and clay minerals are also explored.

*AGRN 633 Soil Water Pollution (3)*

This course is designed to provide students with knowledge of the reaction and fate of pesticides, agricultural fertilizers, industrial and animal wastes in soil and water. Their relationship to the environment is heavily emphasized.

*PLSC 474/674 Plant Pathology (4)*

The course will examine causes of diseases in agronomic and horticultural crops to include symptom and sign recognition, isolation, enumeration and management of diseases in the landscape and field crops. Lab exercises will include preparation of a journal-type manuscript based on an individual research project. Cross-listed with PLSC 474.

*PLSC 603 Ecology of Plant-Microbial Systems (3)*

The course provides an in-depth study of the degradation of pollutants in plant-microbial systems and the role of plant-microbial interaction on the attenuation of environmental contaminants. Plant and microbial-mediated mechanisms of pollutant transformation will be covered. The role the rhizosphere as a unique environment for the detoxification of aggressive compounds will be emphasized.

*PLSC 606 Crop Physiology and Ecology (3)*

This course involves in depth discussion of ecological factors affecting crop growth, development and productivity.

*PLSC 676*

This Course emphasizes the principles and current techniques involved in propagating different types of plants using seeds and various vegetative structures. Students will evaluate and apply relevant and appropriate propagation techniques to plant, review and analyze propagation information and data.

*PLSC 680 Individual Studies in Plant and Soil Science (1-3)*

The student is required to produce a scholarly paper, which provides a critique of a selected topic in Plant and Soil Science. This can be used to satisfy the "creative component" requirement for students pursuing the non-thesis option.

**For information on this program, please contact:**

Jurgen Schwarz, Ph.D.

Graduate Program Coordinator

Food and Agricultural Sciences Program  
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[Phone: 410-651-6168](tel:410-651-6168)

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## Ph.D. Food Science and Technology

### **Objective of the Program**

The Food Science and Technology (FDST) Program is part of the Department of Agriculture, Food and Resource Sciences in the School of Agricultural and Natural Sciences. The mission of the FDST Doctoral program is to prepare students for successful careers and life-long learning experiences within the food industry, academia and government. Specifically, the program aims:

- ☐ To meet the need for highly trained food scientists, including food safety professionals, by providing a multi-disciplinary education and intensive research experiences in food science and technology.
- ☐ To provide in the Land Grant tradition a national and international Center of Excellence in Food Science and Technology that will be used for teaching, research and outreach to include the education and training of personnel who are or will be involved in the food related sectors of agriculture.
- ☐ To create new opportunities and training for UMES students to develop their skills and competencies in problem solving, critical and analytical thinking and communications, with an emphasis on food safety and food quality systems.

### **Admission Requirements**

Regular Admission may be granted to applicants with a baccalaureate and a Master's degree (thesis option) in either food science or related disciplines (nutrition, microbiology, chemistry, biology, animal and poultry science, environmental science, plant and soil science, veterinary medicine, etc.). GRE scores (General Test) may also be considered.

Applicants may be considered for admission into the Ph.D. program with a minimum of 30 credit hours beyond the B.S. degree, or only the B.S. degree, and may be admitted:

1. on a provisional basis with final acceptance to the Ph.D. program contingent upon successful completion of a probationary period, usually the second semester after matriculation, and on the recommendation of the student's Graduate Committee; or
2. admitted to Regular Status based on a high GPA (3.5/4.0), strong background in the food sciences and potential demonstrated in GRE scores (General Test), and strong support of recommenders that the applicant has the ability to complete the Doctoral degree.

Provisional Admission may be granted to applicants with the baccalaureate and the Master's degree, or the baccalaureate degree, who need prerequisite coursework or are pending award of the Master's degree (See Graduate School subsection on *Provisional Admission Status*). International students must take the Test of English as a Foreign Language (TOEFL) and score a minimum of 80 (web based test). International applicants must also submit documentation that they will be financially able to support their studies.

Additionally, to be admitted to the FDST program, each applicant must submit a brief description of his or her intended dissertation research proposal with the completed application package. If admitted, the student in consultation with his/her academic adviser and Graduate Dissertation Advisory Committee, will decide on the research proposal.

The FDST Executive Committee will subsequently review the dissertation proposal to determine the appropriateness of the intended research for the FDST program.

### **Application Deadlines**

Fall Semester - April 15  
Spring Semester - October 30  
Summer Sessions - April 15

### **Program Retention and Graduate Committee Role**

The program requires completion of a dissertation as partial fulfillment for the Doctoral degree. Each student is initially assigned a major Advisor who is responsible for advising the student on all aspects of the student's progress throughout the program.

The major Advisor must be a Regular member of the University of Maryland Eastern Shore Graduate Faculty.

The student must have a major professor (Regular Graduate Faculty Status) and select a Graduate Committee no later than the end of the second semester of enrollment. Before the end of the second semester of enrollment, each student's program of study is planned in consort with the major professor (advisor) and the Graduate Committee, including any transfer credits to be applied to the degree program. The Graduate Committee must have five members, three of whom must hold UMES Regular or Associate Graduate Faculty status membership, and a majority of the Committee must be UMES full-time faculty in academic departments. The major professor chairs the Committee. Annual student progress reviews will be conducted by the Committee to ensure satisfactory progress of students toward degree completion. All students must maintain a cumulative 3.0 GPA, pass a written comprehensive examination and complete degree requirements, including dissertation within seven years of initial enrollment if full-time, otherwise nine years if part-time.

### **Exit Degree Requirements**

The Ph.D. requires a minimum of 36 credits beyond the M.S. level (or 66 credits minimum beyond the baccalaureate degree), with at least 24 credits of course work and 12 credits of dissertation research; those with only a Bachelor's degree will need additional coursework to meet the 66 credits minimum. Of the minimum 24 credits of course work, there are 9 credit hours of core courses and 15 credit hours of electives. Twelve credits of course work must be at the 600 level or above. Formal application for advancement to candidacy in the Doctoral program requires successful completion of both the comprehensive examination and an oral defense of the dissertation proposal. The Graduate Committee administers the comprehensive examination, defense of the dissertation proposal, oversees the student's dissertation research, and administers the dissertation seminar and final dissertation defense (see the *Graduate School's Established Procedures for Conduct of the Doctoral Dissertation Defense* in this Catalog – Pg. 62).

Full-time students must be advanced to candidacy, i.e., taken and passed the comprehensive examination and dissertation proposal defense, no later than four years after matriculation. Part-time students follow the Graduate School's time limits for Doctoral degrees (5 years to Advancement to Candidacy, 4 years to final dissertation submission).

For further information and forms, students should consult the booklet *Guidelines for the Graduate Degree Programs in Food and Agricultural Sciences and Food Science & Technology*; the Graduate School booklet on *Guidelines for Graduate Student Academic Advisement*, and the sections in this Catalog on the *Graduate School Requirements Applicable to the Ph.D. Degree*, the *Established Procedures for Conduct of the Doctoral Dissertation Defense*, *Minimum Registration Requirements*, *Minimum Registration Requirements for Doctoral Candidates and Dissertation Research*.

## **Credit Requirements and Distribution**

*(NOTE: Credit Hours are given in parentheses)*

### Core Requirements: (9)

- FDST 700 Seminar in Food Science & Technology (3)
- AGSC 605 Statistics in Agricultural Research (3)
- AGSC 691 Research Methodology in the Agricultural Sciences (3)

### Dissertation: (12)

- FDST 899 Doctoral Dissertation Research (1-12)

### Electives: (Select 15 credits from the list below or use other courses as approved by the advisor in consultation with the advisory committee)

- AGRI 684 Recombinant DNA Technology (3)
- ANPT 622 Analytical Laboratory Methods (2)
- ANPT 611 Poultry Diseases and Hygiene (4)
- ANPT 614 Advanced Animal and Avian Physiology (4)
- ANPT 624 Animal & Avian Health and Diseases (4)
- ANPT 634 Advanced Animal and Avian Diseases (4)
- BIOL 601 Environmental Microbiology (4)
- CHEM 672 Carbohydrate Chemistry (3)
- CHEM 670 Advanced Biochemistry (3)
- CHEM 621 Advanced Environmental Chemistry (4)
- CSDP 604 Computer Methods in Statistics (3)
- CSDP 658 Computer Applications in Agriculture (3)
- FDST 493 Food Chemistry (3)
- FDST 680 Food Policy Regulations (3)
- FDST 692 Advanced Food Microbiology (3)
- FDST 693 Food Microbiology Lab (2)
- FDST 801 Food Quality Assurance (3)
- FDST 802 Advanced Food Toxicology (3)
- FDST 805 Food Processing (3)
- NUDT 654 Nutritional Biochemistry (4)
- FDST 670 Advanced Food Safety (3)

Students not having a prior statistics course will be required to complete a prerequisite statistics course.

Students who have previously completed some core requirement courses will take different courses, or if eligible to transfer a research methods or statistics course will be advised and assisted by the major advisor in identifying an alternate course.

## **Course Descriptions**

*(NOTE: Credit Hours are given in parentheses)*

### *FDST 700 Seminar in Food Science and Technology (1)*

This course is designed to build communications skills for graduate students. Presentations, both verbal and written, are prepared and given by students following an extensive review of the technical literature. Seminar topics to be presented include the specific research area of

the student as well as more general topics in the food science field. A minimum of three (3) credit hours is required of all students in the program.

***AGSC 605 Statistics in Agricultural Research (3)***

Emphasis is placed on techniques and application of statistical and experimental design, data acquisition, analysis, interpretation and presentation as applied to the Agricultural Sciences.

***AGSC 691 Research Methodology in the Agricultural Sciences (3)***

Students will learn the basic principles of research methodology. Emphasis will be placed on techniques used in identifying problems, forming hypotheses, constructing and using data-gathering instruments, designing research studies, and employing statistical procedures to analyze data.

***AGRI 684 Recombinant DNA Technology (3)***

This is a laboratory course to introduce the basic principles of gene cloning, give essential background on working with E.coli, utilize different cloning systems and employ methods utilized for DNA sequencing.

***ANPT 424/624 Animal and Avian Health and Diseases (4)***

The study of parasitic, viral, bacterial and protozoal disease of mammalian and avian species will be covered. Methods of disease prevention, control and eradication will also be discussed.

***ANPT 611 Poultry Diseases and Hygiene (4)***

Students will study the parasitic, viral, bacterial and protozoan diseases of domestic poultry. Methods of disease prevention, control and eradication will also be discussed.

***ANPT 614 Advanced Animal and Avian Physiology (4)***

This course covers an in depth presentation of major organ systems and their interaction in the maintenance of homeokinesis.

***ANPT 622 Analytical Laboratory Methods (2)***

The application of analytical laboratory techniques used in biomedical research will be explored.

***ANPT 634 Advanced Animal and Avian Diseases (4)***

Students will study the nutritional and metabolic diseases and the isolation and cultivation of macro-and microscopic parasites inclusive of gross and microscopic pathology.

***BIOL 601 Environmental Microbiology (4)***

Topics include microbial ecology of plants and animals, aquatic microbial ecology (including medical implications), soil microbial ecology, biodegradation, microbial insecticides, gastrointestinal microbiology, microbiology of foods and environmental problems management. Each student will be required to complete an independent research project.

Prerequisite: General Microbiology

***CHEM 672 Carbohydrate Chemistry (3)***

This course is an advanced course on carbohydrates. The course will cover the structure, synthesis and biological function of carbohydrates as well as the clinical and commercial value of carbohydrates. The course will involve detailed studies of the structures and cellular functions of carbohydrates and glycoconjugates of plants and animals. The course will place special emphasis on techniques for the analysis and biosynthesis of complex carbohydrate structures and the relevance of the techniques to biomedical research. The major part of the

course material will be based on current research findings in carbohydrate chemistry. Students will be required to read and write papers on current research findings on selected topics on carbohydrates. An oral presentation is required.

***CHEM 670 Advanced Biochemistry (3)***

The course covers the classification, chemistry and metabolism of protein, amino acids, carbohydrates and lipids. Prerequisite: One semester of Biochemistry.

***CHEM 621 Advanced Environmental Chemistry (4)***

The origin, transport and effects of atmospheric and aquatic pollutants are studied, with emphasis on energy-related pollutants which include coal, oil and synfuels. Prerequisites: One year of General Chemistry, one semester of Organic Chemistry and one semester of Analytical Chemistry or permission of the instructor.

***CSDP 604 Computer Methods in Statistics (3)***

This course is an introduction to the principles and applications of probability and statistics needed in graduate studies in various academic areas and to the computer realization of these methods. The course begins with a brief intensive review of basic statistical principles. Prerequisites: One Semester of calculus.

***CSDP 658 Computer Applications in Agriculture (3)***

Current topics include expert systems for small farm applications, farm-record management, and special planning tools for agriculture.

***NUTD 654 Nutritional Biochemistry (4)***

The course reviews recent developments in nutritional sciences, designed to acquaint students with laboratory procedures in nutritional biochemistry and physiology, including the identification and measurements of nutrients and their metabolites in foods, tissue and body fluids and human and animal experiments in nutrition. Special emphasis is placed on the relationship between biochemistry and nutrition.

***FDST 670 Advanced Food Safety (3)***

The course emphasizes current trends in number of areas: food safety and emerging food borne pathogens, regulating food safety, traditional and rapid microbiological methods, relationship of environmental factors to occurrence, growth and survival of microorganisms in foods, mechanisms of control, HACCP, risk assessment, sanitation and food safety education. Special emphasis is placed on actual food borne outbreaks. Prerequisite: BIOL 301 or AMIC 324 or permission of the instructor.

***FDST 493 Food Chemistry (3)***

This course presents the chemistry of food components including water, carbohydrates, liquids, proteins, vitamins, and minerals, as well as additives including preservatives, colorants, flavors, antioxidants and sweeteners. Functionality and interaction of components and their importance to quality and wholesomeness of foods will be discussed. Prerequisites: CHEM 212 or permission of instructor.

***FDST 680 Food Policy Regulations (3)***

The course focuses on food and nutrition policy development, guidelines that govern compliance and enforcement rules in inspection, labeling, import and export and federal and state food regulations. Emphasis is given to HACCP and food safety education.

***FDST 692 Advanced Food Microbiology (3)***



This course is designed to provide the microbiologist and/or food scientist with extended education and training in food microbiology. Emphasis on spoilage and pathogenic microorganisms in food includes detection, identification, characterization, and control methods utilized. Ecology and survival strategies of pathogens in foods and virulence mechanisms of food borne pathogens are being discussed. Prerequisites: BIOL 301 or AMIC 324

*FDST 693 Food Microbiology Laboratory (2)*

The course is designed to introduce techniques for detecting and enumerating microorganisms in foods. Conventional and rapid microbiological methods, immunoassays and molecular techniques will be applied to determine the microorganisms and their end products in foods.

*FDST 801 Food Quality Assurance (3)*

This course provides understanding of food quality control/assurance programs and compliance with government regulation. Topics presented include International Standards for Quality Management Systems, ISO 9000, Good Manufacturing Practices (GMP), Total Quality Management (TQM) and Hazard Analysis Critical Control Point (HACCP). The class also covers factors affecting the quality of food products, such as appearance, flavor, texture, nutritional value, safety and wholesomeness as well as principles of statistical quality control. Prerequisite: FDST 493

*FDST 802 Advanced Food Toxicology (3)*

This course emphasizes biological and chemical aspects of toxicology, microbial aspects of food borne infections and intoxications, food additives, toxic substances occurring in food, either naturally or formed during processing, and the toxic effects of these substances on the biological systems. Safety of genetically engineered foods, risk assessment and food safety policy will be discussed as general topics. Prerequisite: permission of instructor

*FDST 805 Food Processing (3)*

This course integrates principles of food chemistry, food microbiology, food engineering, nutrition, statistics and sensory evaluation through discussion of food processing operations, such as processing of fruit and vegetables, dairy, seafood, fats and oils, beverages, and chocolate manufacture. Food sanitation as well as food packaging will be discussed as general topics. Prerequisites: Permission of instructor.

*FDST 899 Doctoral Dissertation Research (1-12)*

Repeatable credit.

**For information on the FDST program, please contact:**

Jurgen Schwarz, Ph.D.  
Program Director – FDST Program  
Center for Food Science and Technology  
University of Maryland Eastern Shore  
Princess Anne, MD 21853  
Email: [jschwarz@umes.edu](mailto:jschwarz@umes.edu)  
Phone: 410-651-7963

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## Department of Natural Sciences and Interdepartmental

### **Degrees Offered**

Master of Science (M.S.), Chemistry

Master of Science (M.S.), Marine-Estuarine-Environmental Sciences

Doctor of Philosophy (Ph.D.), Marine-Estuarine-Environmental Sciences

Professional Science Master's, Quantitative Fisheries and Resource Economics

Master of Science (M.S.), Toxicology

Doctor of Philosophy (Ph.D.), Toxicology

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### **M.S., Chemistry**

#### **Objective of the Program**

The Master of Science (M.S.) Program in Chemistry provides the educational opportunity to prepare students for employment or provide them the opportunity to enhance their research skills in the disciplines of chemistry.

#### **Program Degree Requirements**

The goal of the Program is to provide a challenging educational opportunity that will prepare students for careers in research, industry, or for entrance into doctoral degree programs. To accomplish this goal, the Program will:

- engage students in a variety of laboratory, classroom and co-curricular activities so they gain the skills necessary to succeed in academic and professional environments
- develop skills that will facilitate lifelong learning
- teach students to assume leadership roles in professional activities and organizations that advance the chemical sciences

Students will be required to interview at least three graduate faculty members in the DNS during their first semester and select a graduate advisor by the end of the second semester. The student will complete the "Advisor Selection Form" at the conclusion of their interviews. The graduate advisor will appoint a permanent committee, the Advisory Committee, by the end of the second semester by completing the "Committee Selection Form" and returning it to the DNS Chairperson.

A program of study will be developed by the Advisory Committee and approved the DNS Chairperson. This may include any missing prerequisites, required core courses, and suggested electives. The total number of required course credit hours may exceed the usual 30 hour minimum for the M.S. Program in Chemistry in some cases. Although graduate courses taken elsewhere may serve to fulfill requirements, only six credits of such courses may be transferred. Transferable credit hours must be approved by the DNS Chairperson. Courses used to satisfy requirements for a previously awarded degree may not be used for credits.

Students enrolled in the Program must successfully complete a series of cumulative exams beginning no later than their third semester of registration in the graduate program. A student will be required to accrue a minimum of 12 points in a series of seven consecutive cumulative exams (3 points each) to attain candidate status. Failure to pass the cumulative exams will result in disqualification from the Program.

## **Credit Requirements and Distribution**

*(NOTE: Credit Hours are given in parentheses)*

Students will be required to successfully complete 30 credit hours for the Program in the following areas:

- 12 credit hours of Core Courses
- 9 credit hours of Electives

Elective courses must be at the 600 level to fulfill credit hour requirements.

- 3 credit hours of Graduate Seminars
- 6 credit hours of Thesis Research

### **Core Courses**

**CHEM 620 Advanced Inorganic Chemistry (3)**

**CHEM 632 Advanced Organic Chemistry (3)**

**CHEM 670 Advanced Biochemistry (3)**

**CHEM 680 Quantum Mechanics (3)**

**CHEM 690 Principles of Chemical Separations (3)**

**CHEM 695 Applied Spectroscopy (3)**

### **Electives**

**CHEM 601 Chemical and Statistical Thermodynamics (3)**

**CHEM 621 Advanced Environmental Chemistry (3)**

**CHEM 622 Bioinorganic Chemistry (3)**

**CHEM 671 Protein Chemistry and Enzymatic Catalysis (3)**

**CHEM 672 Carbohydrate Chemistry (3)**

A grade of B or better must be earned in each course to receive credit toward graduation. A student will not be permitted to graduate with a grade of "I" on his/her transcript. If a student's grade point average falls below a 3.0 at any time, the student will be placed on academic probation and subject to review by their Advisory Committee and the DNS Chairperson. The Advisory Committee and Chairperson will ultimately decide the fate of the student.

### **Thesis**

The proposed Program offers the Thesis Option only. The Advisory Committee will administer the thesis defense after all other degree requirements, as enumerated above, have been fulfilled. The Advisory Committee will also decide the outcome of the candidate's defense examination. The student is required to provide each Committee member with a copy of his/her thesis two weeks prior to his/her defense. One copy of the successfully defended thesis must be submitted to both the Graduate School and Department of Natural Sciences offices.

### **Information Technology**

Students in the Program will be required to be competent in programs commonly used in science such as Excel to process scientific data, SigmaPlot to produce graphs and develop calibration models, Microsoft PowerPoint for the development of quality presentations, Microsoft Publisher to create poster presentations, CHEMDRAW for the creation of molecular structures, and Microsoft Word in the preparation of manuscripts. Student must also be proficient in online literature searches using various databases.

**Application Deadlines**

Fall Semester - April 15  
Spring Semester - October 30  
Summer Sessions - April 15

**Course Descriptions**

(NOTE: Credit Hours are given in parentheses)

***CHEM 601 Chemical and Statistical Thermodynamics (3)***

This course will cover statistical mechanics, three laws of thermodynamics and chemical kinetics. It includes the discussion of reversible and irreversible thermodynamics of gases, liquids, solution and solids. Reactions and determination of rate laws for simple and complex reaction will be examined. Application of these principles to gases, solution, mixtures, and solid will be discussed.

***CHEM 620 Advanced Inorganic Chemistry (3)***

This course is intended for first or second year graduate students. Students will gain knowledge of Inorganic Chemistry to solve practical problems. Solids, Symmetry, Ligands, and Chemistry of Main Group and Transition Elements will be covered.

***CHEM 621 Advanced Environmental Chemistry (3)***

The origin, transport and effects of atmospheric and aquatic pollutants are studied with emphasis on energy related pollutants which include coal, oil and synfuels. Prerequisites: One year of general chemistry, one semester of organic chemistry and one semester of analytical chemistry, or permission of the instructor.

***CHEM 622 Bioinorganic Chemistry (3)***

This course deals with the functions of metallic elements in biology. These functions range from simple structural roles to much more complex roles when they transfer electrons and break bonds. Consequently the roles of metal ions and a variety of non-metals in crucial life processes will be discussed. This course will also examine the physical methods and techniques used in this field (e.g. EXAFS, ESR, Mossbauer, and NMR). In-depth discussion will also cover metalloenzymes and metal complexes used as imaging agents.

***CHEM 632 Advanced Organic Chemistry (3)***

Advanced Organic Chemistry addresses two fundamental skills in organic chemistry. First, the students will acquire the latest knowledge and expertise in the utilization of modern analytical instrumentation routinely in research laboratories, namely multidimensional NMR and MALDI-TOF Mass Spectrometry. Secondly, this course will provide an in-depth study of reaction mechanisms of the most fundamental reaction in Organic Synthesis, namely the different ALDOL reactions. The course also highlights the latest advances in synthesis, the newly introduced coupling protocols such as the "Heck", the "Suzuki-Miyaura", and the "Negishi" coupling reactions as well as other elegant technologies in the field of study.

***CHEM 670 Advanced Biochemistry (3)***

This course covers the classification, chemistry and metabolism of proteins, amino acids, carbohydrates and lipids. Prerequisite: One semester of biochemistry.

### *CHEM 671 Protein Chemistry and Enzymatic Catalysis (3)*

The course involves the study of the structures and functions of proteins. Emphasis will be placed on the application of the structure-function relationships to the development of experimental protocols for studies in biochemical research.

### *CHEM 672 Carbohydrate Chemistry (3)*

The course involves detailed studies of the structures and cellular functions of carbohydrates and glycoconjugates of plants and animals. The course will place special emphasis on techniques for the analysis and biosynthesis of complex carbohydrate structures and the relevance of the techniques to biomedical research.

### *CHEM 672 Carbohydrate Chemistry (3)*

This course is an advanced course on carbohydrates. The course will cover the structure, synthesis and biological function of carbohydrates as well as the clinical and commercial value of carbohydrates. The course will involve detailed studies of the structures and cellular functions of carbohydrates and glycoconjugates of plants and animals. The course will place special emphasis on techniques for the analysis and biosynthesis of complex carbohydrate structures and the relevance of the techniques to biomedical research. The major part of the course material will be based on current research findings in carbohydrate chemistry. Students will be required to read and write papers on current research findings on selected topics on carbohydrates. An oral presentation is required.

### *CHEM 680 Quantum Mechanics (3)*

This course will cover Schrödinger's Equation, particles in a potential well, angular momentum, variation method, and time-independent perturbation theory. It will also discuss the application of quantum mechanical principles to current problems in chemistry such as: thermodynamic properties of gases, chemical bonding, the Born-Oppenheimer Approximation, and molecular spectra.

### *CHEM 690 Principles of Chemical Separations (3)*

Chemical separations play a central role in many areas of chemistry and other disciplines. For example, the cleaning up of polluted water or soil, the treatment of discharge streams from chemical processes, or modification of a specific process to decrease its environmental impact. Thus, this course will focus on the use of separation technology as a unit operation in chemical and environmental applications. Specifically, this course will describe how property differences are used to generate separations, the use of separating agents, and the selection criteria for particular separation techniques. The general approach for each technology is to present the chemical and/or physical basis for the process and explain how to evaluate it for design and analysis. Topics covered in this class will include: 1. Separations as unit operations; 2. Separations analysis fundamentals; 3. Distillation; 4. Extraction; 5. Absorption and stripping; 6. Adsorption; 7. Ion exchange; 8. Membranes.

### *CHEM 695 Applied Spectroscopy (3)*

This course involves a practical approach to the application of spectroscopic techniques such as infrared, ultraviolet/visible, nuclear magnetic resonance and mass spectroscopy as tools to solving problems in biochemistry, chemistry, and other related fields of study.

### *CHEM 697 Department of Natural Sciences Graduate Seminar (1)*

Students will be required to present three seminars during the course of the program. Topics for the seminars shall comprise a report on the student's thesis research and a paper selected from a high impact journal dealing with current discoveries and innovations in chemistry and biochemistry. The course grade will be based on evaluations from faculty. Grading will be based on organization, clarity of presentation, knowledge of the subject and scientific merit.

#### *CHEM 799 Master's Thesis Research (6)*

Students who are working on their Master of Science thesis register in this course which will count towards the partial fulfillment of curriculum requirements for the MS degree in Chemistry. The student is required to prepare a proposal for a detailed research study, have that proposal approved by an appropriate faculty Advisory Committee, complete the proposed study, and write and defend the completed Thesis in a final oral examination. The work will be conducted independently by the student outside the context of structured class meetings. The student's role is to identify an appropriate research question, develop a systematic research plan to address it, and then execute this plan themselves, collecting, analyzing and interpreting the resulting data and writing them up in standard scholarly format. The faculty advisor's role is to provide guidance in these various steps where appropriate, such as in helping to identify the research question and in providing feedback on the student's proposed research design, its execution, and the data.

#### **For more information on this program, please contact:**

Deborah Sauder, Ph.D.

Chairperson

Department of Natural Sciences (DNS)

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## M.S., Ph.D., Marine-Estuarine-Environmental Sciences

### **Introduction**

The University of Maryland Eastern Shore (UMES) offers graduate programs leading to the degrees of Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) in the Marine-Estuarine-Environmental Sciences (MEES). The mission of the MEES Program is to train graduate students in the overall environmental sciences. There is a clear need for scientists with training in this area, given the multitude of environmental problems faced by society today. The interests of students in the program are diverse, but generally center on some aspect of the interaction between biological and physical or chemical systems. The analysis of this interaction may be anything from a study of molecular mechanisms to an assessment of the economics of an environmental impact. To ensure that all students in the program have some understanding of the breadth of information in the field of environmental sciences, each student is required to have course work in a variety of areas.

The interests of faculty and students within the MEES Program have led to six formally defined Areas of Specialization (AOS), from which a student may choose. The AOSs are:

1. Ecology
2. Environmental Chemistry
3. Environmental Molecular Biology and Biotechnology
4. Environmental Science
5. Fisheries Science
6. Oceanography.

Each student will choose an AOS when applying, and both admission and program requirements will depend on the AOS and the student's background and interests.

The strongest concentrations at UMES are in the areas of Ecology, Environmental Chemistry, Environmental Science and Fisheries Science, with Environmental Molecular Biology and Biotechnology under development and strengthening.

### **General Information and Program Overview**

The MEES Program is a University System of Maryland (USM) interdisciplinary graduate degree program. Courses taken by MEES students are taught on participating USM campuses and USM research laboratories. A course taught at a USM campus is available to enrolled graduate students through the intercampus enrollment process.

Applicants as well as matriculated students to the program should consult the MEES program website for additional information and details on the program which are not covered in the MEES program section of this Catalog, and for any updates to the program after the time of printing. The MEES program comprehensive website is [www.mees.umd.edu](http://www.mees.umd.edu).

### **Overall Degree Program**

#### Admission

Applicants will be considered for admission and advising on participating campuses by faculty associated with an appropriate Area of Specialization (AOS) based on the applicant's requests. Applicants are free to apply to more than one AOS, if so desired. Prospective students may apply through either the University of Maryland Baltimore County Graduate School, the University of Maryland Graduate School at College Park, or the Graduate School at UMES. In

general, a student who has identified a specific member of the faculty with whom to work should apply to the campus where that faculty member is affiliated. A student may also apply to a particular campus due to geographic considerations. See the UMES contacts for inquiries and application at the end of this section.

Applicants to the MEES Program will be considered at both the M.S. and Ph.D. levels. In the event an applicant to the Ph.D. program has only a BA or B.S. degree, admission may initially be to the M.S. program with the final acceptance to the Ph.D. program contingent on successful completion of a probationary period (usually one year) and on the recommendation of the student's Research Advisory Committee.

An Admissions Committee from each AOS has been established to evaluate the applications of prospective students based on the following criteria:

1. The applicant's research interests must be clearly stated and relevant to one or more of the MEES AOS.
2. The academic preparation of the applicant must be consonant with stated interests and AOS requirements.
3. The undergraduate GPA must be at least 3.0, although some students with a GPA of 2.75 may be provisionally accepted based on related research or work experience.

Applicants must submit the following required documents as part of their application for graduate study in the MEES Program:

1. Graduate Record Examination Scores. Only the General Test is required, although one of the Advanced Tests is strongly recommended. (See the AOS prerequisites).
2. Transcripts of all college-level work.
3. A brief essay clearly defining areas of research interest and research objectives preferably including the AOS of interest. The essay should be carefully prepared, not in outline form, and will assist with identification of an academic advisor should the applicant be judged admissible.
4. Three letters of recommendation from persons familiar with the academic work of the applicant.

The initial screening of an applicant's credentials is done by the Admissions Committee of the appropriate AOS. Each AOS has course prerequisites (described in subsequent subsections). Applicants missing several of these prerequisite courses may be offered provisional acceptance. Applicants missing four or more prerequisites will generally not be admitted, and should plan to take some of those courses before re-applying.

Receipt of the application will initiate the search for an appropriate faculty member to serve as the academic advisor for the student. No student will be admitted to the Program for whom an advisor has not been identified in advance. Hence, if prior discussions have taken place between an applicant and a member of the faculty regarding the faculty member serving as advisor to the student, that fact should be mentioned in the application and the



potential advisor should forward a letter of agreement. The student will be matriculated on the degree-granting campus of his/her advisor, following admission of the applicant by the respective Graduate School.

### **Application Deadlines**

Fall Semester - February 1  
Spring Semester - September 1

### **Application Deadlines For International Applicants**

Fall Semester - February 1  
Spring Semester - June 1

### **Advisors and Research Advisory Committees**

Upon admission to the MEES Program, students are assigned to an academic advisor. This person will be responsible for advising on all aspects of the student's progress through the program. Any request for a change of advisor must be submitted to and be approved by the AOS Committee and the MEES Program Director (Central Office).

In certain situations, a student may want a second academic advisor. This might happen if, for instance, the professor most familiar with the student's work will have only an Associate Graduate Faculty status. In this case, it is possible to set up a co-advisor team of two professors who jointly serve in the role of advisor (the other having Regular Graduate Faculty status).

Due to the expected divergent interests and goals of students in the MEES Program, as well as the dispersion of campuses and laboratories, the early formation of a Research Advisory Committee is mandatory to develop an individual program. During the first semester of enrollment in the MEES Program, the student and the advisor must form this Committee and submit its membership to the AOS Committee Chairperson for approval. The Committee should meet during the first semester, and must make its written recommendations for a program of study before the end of the second semester.

A Master's Research Advisory Committee will consist of three members, all of whom must be Regular or Associate members of a University System of Maryland (USM) campus Graduate Faculty. A Ph.D. Research Advisory Committee must have five members, three of whom must be Regular or Associate faculty as above. The Ph.D. Research Advisory Committee can consist of a minimum of three members, who are UMS graduate faculty, until the Comprehensive Examinations, at which time, it must have all five members. The student's advisor will serve as Chair of this Committee. The membership of the Research Advisory Committee should not be drawn entirely from a single laboratory or department. Replacement of Committee members is expected, as needed, based on the advisor's recommendation.

The program of study is laid out by the Research Advisory Committee in the first or second semester and will include any missing prerequisites [all prerequisites must be completed within the first year in the program], all required core courses, and any specialized courses the Committee believes the student needs. Total required and suggested courses will often exceed the general credit minimum (30 for M.S. and 36 for Ph.D.). The program of study must then be approved by the appropriate MEES AOS Committee.

The Research Advisory Committee is responsible for initial approval of the student's area of research. Once the student has chosen an area of research, a proposal should be written up and discussed with the Research Advisory Committee. This preliminary research proposal should be brief (3-5 pages), but should cover as specifically as possible the student's research interests. Students in the Ph.D. program will later develop a more comprehensive research proposal which they must defend before advancement to candidacy. Students in the M.S. program will develop a more complete Thesis Proposal to submit to their Research Advisory Committee as described below. The approved preliminary proposal should be filed with the MEES Program Director's office by the end of the second semester following entry into the MEES Program.

An M.S. student's Research Advisory Committee will approve the Thesis Proposal and the Thesis Defense. Master's students are not required to take Comprehensive Examinations. For Ph.D. students, the Research Advisory Committee will administer the Defense of the Dissertation Proposal, oversee the student's research, and administer the Dissertation Defense. Once formulated, the names of the Research Advisory Committee members must be submitted to an AOS Committee Chairperson for approval.

Annual progress reviews initiated by the advisor will be conducted through the MEES Program Central Office and the AOS Committees to ensure satisfactory progress of MEES students toward degree completion (coursework and research direction).

### **MASTER OF SCIENCE REQUIREMENTS**

The specific requirements for the MEES M.S. degree program are as follows:

#### **Course Work**

1. A minimum of 30 credits with 24 credits of course work and 6 credits of graduate research. Of the 24 course credits, 12 of them must be at the 600 level or higher. Exceptions and waivers for equivalent courses taken at other institutions may be used to meet prerequisite requirements of the student's AOS upon approval of the appropriate AOS Committee. Although graduate courses taken elsewhere may serve to fulfill AOS requirements, only six credits from such courses may be identified as transfer credits. Courses used to fulfill requirements for a previously awarded degree cannot be used for transfer credits.
2. One seminar course (MEES 608 or equivalent) must be taken for each year in residence (on average) for a total of 2.
3. One approved Statistics course (400 level or higher) is required.
4. One graduate course representing significant interdisciplinary breadth, preferably outside the student's AOS is required.
5. One course or seminar in Environmental Management (a 3-4 credit course can satisfy '4' above) is required.

#### **Thesis Defense**

An oral defense of the thesis, administered according to Graduate School procedures will take place at the completion of the research project. This defense will be conducted by the Research Advisory Committee and will be administered once all other degree requirements

have been fulfilled. The thesis defense will generally last no longer than two hours, but the time will be long enough to ensure an adequate examination. The RAC also approves the thesis, and it is the candidate's obligation to see that each member of the Committee has at least *two weeks* in which to examine a copy of the thesis prior to the time of the defense. The RAC may conclude that the candidate has passed or failed. A student may be conditionally passed with the provision that minor changes in the thesis be made by the student and approved by the major advisor. A student who fails may, at the discretion of the Committee and with approval of the MEES Program Director and the UMES Graduate Studies Dean, be permitted to stand a second defense after acting on suggestions for improvement of the thesis (e.g., collection of more data, use of different statistical analysis, rewriting of the discussion, etc.), at such time as the advisor considers appropriate. Once the thesis has been successfully defended, one copy must be supplied to the UMES MEES Office in addition to the copies required by the Graduate School.

### **DOCTOR OF PHILOSOPHY REQUIREMENTS**

The specific requirements for the MEES Ph.D. degree program are as follows:

#### **Course Work**

1. The student must complete a minimum of 36 credits, with at least 24 credits of coursework and 12 credits of dissertation research. Twelve credits of coursework must be at the 600 level or above. Credits used to obtain a M.S. degree at a USM campus or other college/university cannot be transferred to the Ph.D. program. However, if a student has completed a M.S. degree, up to 16 credits of appropriate courses can be waived by petition to the AOS Committee.
2. One seminar course (MEES 608 or equivalent) is required for each year in residence (on average) for a total of 4.
3. One approved Statistics course (600 level or higher) is required.
4. One graduate course representing significant interdisciplinary breadth, preferably outside the student's AOS is required.
5. One course or seminar in Environmental Management is required (a 3-4 cr. course can satisfy '4' above).

#### **Examinations**

Formal application for advancement to candidacy for the Doctoral degree requires successful completion of both a Comprehensive Examination and an oral defense of the Dissertation Proposal. The Comprehensive Examination must be passed before the student can defend the Dissertation Proposal.

1. *Comprehensive Examination:* The MEES Program Central Office has both general MEES and specific AOS Committee guidelines available for comprehensive examinations.

The RAC is responsible for administering the comprehensive examination. Since this examination must be successfully completed before the dissertation proposal can be defended, it is in the student's best interest to take the comprehensive examination as early as possible in the program. The exam must be taken by the end of the student's fifth

semester. This examination is intended to determine whether the student demonstrates sufficient evidence of scholastic and intellectual ability in major and related academic areas. The examination will not be a defense of the research proposal. Areas of the examination will be chosen by the student with the Committee's approval, from a general list formulated by the AOS Committee. One area of the examination must be chosen for interdisciplinary breadth (e.g., relating to the interdisciplinary course from the core curriculum).

The examination will include a combination of written and oral sections. The RAC will determine whether the student passes (a minimum of four affirmative votes is required), or fails. If failed, the examination may, at the recommendation of the RAC, be taken again. In this case the examination should be repeated within one year, but no sooner than six months, after the initial examination. If the examination is failed a second time, admission will be cancelled. Any conditional passing of the examination must be satisfied before the examination can be rendered "successfully completed." The MEES Program Director's office must be notified at least two weeks in advance of the pending examination. A report of the examination will be filed with the Director's Office following the examination.

The USM interactive video network system may be used for oral comprehensive examinations and dissertation proposal defenses but all Committee members, the student and the Graduate Studies Dean must agree to this use. Phone/conference calls are not acceptable alternatives.

2. *Dissertation Proposal Defense:* The proposal defense is an oral examination on the research proposal administered by the Research Advisory Committee. At least two weeks prior to the examination, the student must supply the Committee members with a formal research proposal in which is detailed: background information, research progress to date (if any), specific objectives, and experimental design of the proposed research. The Committee is expected to examine the student on all aspects of the proposed research to determine whether the research plan is sound, and whether the student has the proper motivation, intellectual capacity and curiosity, and has, or can develop, the technical skills necessary to successfully pursue the Ph.D. degree. The student passes if there are at least four affirmative votes. If failed, the student must re-define the proposal within one year. A second failure will result in cancellation of admission.

The research proposal should be defended within one year of unconditionally passing the oral and written comprehensive examination and at least one year before projected completion of the degree requirements. The MEES Program Director's Office must be notified of the pending examination several weeks prior to its administration, and a report of the examination must be filed with the Director's Office following the examination.

At the successful completion of this defense, the student officially applies for *Advancement to Candidacy for the Ph.D. Degree* and should submit the necessary form to the UMES MEES Program Office for transmission to the UMES Graduate School. Students must be admitted to candidacy at least six months prior to the Defense of the Dissertation (final defense).

### **Dissertation Seminar and Defense of the Dissertation Research**

A candidate for the Ph.D. degree will present a public seminar on the dissertation research during the academic year in which the degree will be awarded. The seminar should, under normal circumstances, be given within five weeks in advance of the day of the oral final examination. The student and the advisor will be responsible for initiating arrangements

through the UMES MEES Office for the date and advertisement of the seminar. The seminar will be open to faculty, students, and other interested parties.

The final oral defense of the dissertation is conducted by a Committee of the graduate faculty appointed by the Graduate Studies Dean (this is usually the Research Advisory Committee plus a Graduate Studies Dean's representative). Nominations for membership on this Committee are submitted on the designated form to the UMES Graduate School by the student's advisor. This is done by the third week of the semester in which the student expects to complete all requirements, but no later than two months prior to the defense (see the UMES Graduate School's calendar for Commencement Fall or Spring semester). The time and place of the examination are established by the Chair of the Committee. The student is responsible for distributing a complete, final copy of the dissertation to each member of the Committee at least two weeks before the examination date. Announcement of the final examination will be made through the UMES MEES Office to all members of the MEES faculty at least two weeks prior to the examination. All final oral examinations are open to all members of the graduate faculty and students, although only members of the Examining Committee may question the candidate. After the examination, the Committee deliberates and votes in private. Two or more negative votes constitute failure. The student may be examined no more than twice.

Following successful completion of the final examination, a final copy of the dissertation must be supplied to the UMES MEES Office, in addition to those required by the UMES Graduate School.

## **Areas Of Specialization (AOS)**

### **A. Ecology**

The MEES Program provides access to a strong curriculum of interdisciplinary graduate training and research in ecology. Within this Area of Specialization (AOS), numerous scientists throughout the University System of Maryland (USM) are actively involved in teaching and research, with collaboration common between these scientists and those in the other areas of MEES.

Ecology is a broad discipline encompassing terrestrial, aquatic, estuarine and marine environments. Specific areas of study include behavioral, community, evolutionary, marine, benthic, limnological, systematic, and physiological ecology. Variations and/or combinations of one or more of these sub-disciplines are common (e.g. Marine Benthic Community Ecology as one area of study, or the Evolution of Terrestrial Communities as another). Students successfully completing this AOS could go on to academic appointments in a variety of departments (e.g. Environmental Sciences, Ecology, Biology, Zoology, Botany, etc.), or work for environmental consulting companies, as well as federal or state government agencies.

Due to the nature of the MEES Program, heavy emphasis is placed on the student's unique research goals in this AOS. As such, core course requirements are kept to a minimum. The remainder of a student's course load is determined by that student and his/her Research Advisory Committee on the basis of the individual's research topic and previous academic experience. The USM has a wide and diverse set of course offerings in ecology and related areas, so it should be possible for students in almost any area of ecology to create a beneficial program of study.

The MEES Program Ecology faculty believe that graduate students should be well-trained in the following five important areas:

1. Scientific method and experimental design.
2. Statistical methods and use of computers for statistics, database manipulation, and modeling.
3. Ecological theory and mathematical modeling.
4. Field techniques in ecology.
5. Scientific writing.

#### Prerequisites

A Bachelor's degree with courses equivalent to an undergraduate General Biology degree, including:

1. Two semesters of Calculus.
2. Two semesters of Introductory Chemistry.
3. Two semesters of Organic Chemistry or Biochemistry.
4. Two semesters of Physics.
5. Two semesters of Introductory Biology.
6. One Ecology course and two other Advanced Biology courses.

#### Core Courses and Other Requirements (M.S. and Ph.D.)

1. Population Biology – including mathematical modeling (600 level, 3-4 credits).
2. Ecosystem Ecology and/or Community Ecology (600 level, 3-4 credits).
3. A specialized field or laboratory-based Ecology course is recommended.
4. A course from one of the other MEES AOSs (from an approved list).
5. A course in Statistics/Biostatistics (600 level for the Ph.D.; 400 level for the M.S.).
6. One graduate level seminar for each year in residence (on average).
7. One course or seminar in Environmental Management, Policy, Ethics or Philosophy of Science, (400 or 600 level, 1-4 credits).
8. Courses in Experimental Design and Analysis and in Scientific Writing are also strongly recommended.

#### **B. Environmental Chemistry**

The objective of the Environmental Chemistry Area of Specialization (AOS) is to train research scientists to apply basic chemical principles to the study of the environmental behaviors of natural and anthropogenic chemicals. Environmental Chemistry includes interdisciplinary studies which integrate across subjects such as geochemistry, analytical chemistry, transport processes, and toxicology to determine the cycling and impact of chemicals in the natural environment.

As both the Master's and Ph.D. are research-oriented programs, emphasis is placed on learning and applying the scientific method, employing strong quantitative approaches and developing effective scientific writing skills. Students graduating from MEES through this AOS will find professional positions in federal, state and local government agencies (such as EPA, FDA, NIH), private chemical and manufacturing industries, academic institutions, and consulting firms.

#### Prerequisites

A Bachelor's degree in the Natural Sciences or Engineering, including:

1. Two semesters of Calculus.
2. Two semesters of Physics.
3. Two semesters of General Chemistry.
4. Two semesters of Biology.
5. Two semesters of Organic or other Advanced Chemistry (e.g. Biochemistry).

**Core Courses and Other Requirements (M.S. and Ph.D.)**

1. One fundamental and one advanced course in Environmental Chemistry or Geochemistry (one 400-600 level, one 600-700 level 3-4 credits).
2. One course in Physical Transport Processes (600 level, 3-4 credits).
3. One course in Aquatic Toxicology or Ecology (600 level, 3-4 credits).
4. One 400 or 600 level course from one of the other MEES AOSs (from an approved list).
5. One course or seminar in Environmental Management, Policy, Ethics, or Philosophy of Science (a 3-4 credits. Course can satisfy #4 above) (400 or 600 level).
6. A course in Statistics or Applied Mathematics (600 level for the Ph.D.; 400 level for the M.S.).
7. One graduate level seminar for each year in residence (on average).
8. One or more courses in Physical Chemistry are strongly encouraged (2-4 credits each).
9. Courses in Experimental Design and Analysis and in Scientific Writing are also recommended.

**C. Environmental Molecular Biology/Biotechnology**

Molecular approaches pervade every biological discipline, and each MEES campus has distinguished, energetic faculty that emphasize molecular mechanisms of ecological interactions and dynamics. Expertise includes molecular microbial ecology and physiology; bioremediation; molecular endocrinology of fish growth, development and reproduction; environmental stressors contributing to fish physiological dysfunction and oncogenesis; mechanisms and stressors of nitrogen fixation; molecular models of marine surface colonization; molecular cues of organism to organism interaction, and invertebrate immunity. Faculty in this area frequently study macromolecular environmental interactions using recombinant DNA and hybridoma approaches. The Environmental Molecular Biology and Biotechnology Area of Specialization encourages interaction between campuses, and is synergistic with other AOSs.

Several campuses in the University System of Maryland (USM) have facilities specializing in Molecular Biology and Biotechnology, such the Center of Marine Biotechnology of the Maryland Biotechnology Institute, the campuses at Baltimore, Baltimore County and College Park, and facilities underway at UMES.

**Prerequisites**

A Bachelor's degree in the Natural Sciences or Engineering including:

1. Four semesters of Biology including Biochemistry.
2. Two semesters of Physics.
3. Four semesters of Chemistry.
4. Two semester of Calculus.
5. Two semester of Molecular Biology or Molecular Genetics.

#### Core Courses and Other Requirements (M.S. and Ph.D.)

1. One course in Molecular Biology/ Genetics (600 level, 3-4 credits).
2. One course in Cell Biology/Physiology (600 level, 3-4 credits).
3. One course in Ecology (400 or 600 level, 3-4 credits).
4. One course in Advanced Chemistry or Biochemistry (400 or 600 level, 2-4 credits).
5. One elective 400 or 600 level course.
6. One course or seminar in Environmental Management, Policy, Ethics or Philosophy of Science (a 2-4 credits course can satisfy #5. above) (400 or 600 level).
7. A course in Statistics/Biostatistics (600 level for the Ph.D.; 400 level for the M.S.).
8. One graduate level seminar for each year in residence (on average).
9. Courses in Experimental Design and Analysis and in Scientific Writing are also recommended.

*Note: For the M.S. degree, only three of the first four requirements must be fulfilled (Nos. 5 through 8 are required for all students).*

#### **D. Environmental Science**

This AOS provides broad training in the Environmental Sciences. Some students do not want to specialize to the extent the other AOSs require, but would like to gain experience and take courses in a variety of scientific, economic, and social disciplines related to the natural environment. These requirements are also very appropriate for students wishing to specialize in Environmental Management. The relevant graduate training will provide advanced courses in five distribution areas:

1. Biology - Courses in the biological sciences in which the emphasis is on ecology, especially at the population, community, and ecosystem levels.
2. Chemistry - Courses in chemistry as applied to organisms or to the environment, with an emphasis on pollution or environmental toxicology courses.
3. Physical Sciences and Technology - Courses dealing with the physical world or with the application of physical principles or technology to biological or environmental problems.
4. Management, Economics, and Policy - Courses dealing with the interaction of economic, legal, political, and/or social institutions with the biological, chemical or physical environment.

#### **E. Subprogram in Environmental Management: Science and Policy at Participating Campuses**

The primary content of this option within the Environmental Science AOS will focus on developing professionals in the field of environmental management, at the M.S. and Ph.D. levels. Students successfully completing this degree will normally pursue careers in the government or private industry, especially with organizations having strong environmental interests or programs. It is also anticipated that students desiring to work in foreign countries, and foreign students, will take part in this program.

Although the Environmental Management option is open to students at the Master's level, students completing advanced degrees in Applied Ecology and Conservation Biology (M.S., Frostburg State) or Sustainable Development and Conservation Biology (M.S., Maryland, College Park) as well as at other graduate Environmental Management programs within or



outside of the USM could logically pursue a Ph.D. within this AOS. It is also expected that students with strong interests in Restoration and Landscape Ecology or in Environmental Science and Policy would matriculate within the Environmental Science AOS with an emphasis in Environmental Management.

#### Prerequisites

An undergraduate degree in the Natural Sciences or Engineering, including:

1. Two semesters of Calculus.
2. Two semesters of Introductory Chemistry.
3. Two semesters of Physics.
4. Two semesters of Introductory Biology (or high placement test, high GRE Biology scores).
5. Ecology and other advanced Environmental Science courses are recommended.

#### Core Courses and Other Requirements (M.S. and Ph.D.)

1. One approved course from three of the four distribution areas (Biology, Chemistry, Physical Science or Management) for M.S. students, and from each of the four distribution areas for Ph.D. students. One of these courses can be at the 400 level, the others will be at the 600 level or above.
2. A course in Statistics/Biostatistics (600 level for the Ph.D.; 400 level for the M.S.).
3. One graduate level seminar for each year in residence (on average).
4. One or more courses in Computer Science or Computer Applications are strongly recommended.
5. Courses in Experimental Design and Analysis and in Scientific Writing are also recommended.

#### **F. Fisheries Science**

Fisheries Science is multidisciplinary, drawing expertise from the biological, physical and social sciences. Fisheries scientists study populations and communities of aquatic resources, their responses to exploitation and changes in environmental conditions, and their management. Research is quantitative and may be either basic or applied. A diversity of faculty talent exists within the USM to provide graduate students with a strong education in Ecology, Biology and Management of fish and invertebrate resources.

The multidisciplinary nature of fisheries science requires broad training in areas that may include Ecology, Oceanography, Aquaculture, Economics, Mathematics, Seafood Technology, Pathology and Diseases, and Management Science. Students will select a curriculum, with assistance from their Research Advisory Committees, to best achieve their academic and professional goals. The faculty recognizes that flexible, yet rigorous, curriculum choices are important for students in Fisheries Science.

The program in Fisheries offers both M.S. and Ph.D. degrees. Graduates at either level may expect to find challenging career opportunities. Most career opportunities in Fisheries Science are in the government and academic sectors, although in recent years private businesses, research firms and aquaculture businesses offer increasingly diverse career choices.

The course work and research undertaken by MEES students in this AOS emphasize the following three fields of study:

1. *Fisheries Ecology*: This field provides basic studies in fish and invertebrate population biology, food webs, recruitment and life history processes, predator-prey and competitive interactions, diseases, and effects of habitat conditions.
2. *Fisheries Management*: This field provides basic and applied studies on the effects of exploitation, pollution and habitat change on fish and invertebrate populations; assessment of resources and their potential yields; and development of models and information useful for management of living aquatic resources. Students with outstanding credentials in economics, mathematics, or operations research may request the Fisheries AOS to waive certain prerequisites.
3. *Fisheries Aquaculture*: This field contributes to the research on the culture of aquatic organisms and the development of aquaculture systems. This is a broad disciplinary area that includes ecology, physiology, chemistry, genetics, seafood technology, diseases and pathology, engineering, economics and management under its auspices.

#### Prerequisites

A Bachelor's degree in the Natural Sciences or other field with a strong quantitative emphasis, including:

1. Two semesters of Calculus.
2. Two semesters of Introductory Chemistry.
3. Two semesters of Organic Chemistry, Biochemistry, or Physics
4. Two semesters of Introductory Biology (or high placement test, high GRE Biology scores).
5. Advanced Biology courses, such as Ecology and Ichthyology, are recommended.

#### Core Courses and Other Requirements (M.S. and Ph.D.)

Five core courses will be offered, and at least three must be successfully completed by all students entering the Fisheries Science AOS. The requirements may be waived if equivalent course work has been obtained elsewhere, or if the student and his/her Research Advisory Committee successfully petition the Fisheries Science AOS Committee.

1. *Fisheries Science and Management* – This course covers the basic principles of aquatic productivity, fish and invertebrate population biology, the harvest and conservation of resources, assessment of yield potentials, and fishery management practices.
2. *Fisheries Ecology* - This course covers the biological processes that affect the productivity, abundances, and distributions of fish and invertebrate resources. The course includes life history theory, predator-prey relationships, bioenergetics, trophic ecology, and zoogeography.
3. *Aquaculture* - This course covers the theory and practices of modern aquaculture of fishes and invertebrates. The course includes coverage on water quality, production systems, extensive and intensive approaches, culture genetics, and fish diseases and management.
4. *Quantitative Fisheries Science* – This course covers factors affecting the stability and resilience of exploited marine and estuarine populations. Basic ecological models and applied fisheries models are presented in theoretical and practical frameworks. It is recommended that either Fisheries Science and Management or Fisheries Ecology is taken prior to this course.

5. *Graduate Level Course in Oceanography (physical, chemical or biological) or Stream Ecology*  
– The courses cover major and minor elements, composition of seawater, seawater ionic structure and interactions, nutrient distributions, biogeochemical cycles and the biology of marine organisms. Students will obtain most of their academic course work from a broad array of relevant courses presently available throughout the USM. Each student and his/her RAC will design a course of study to be approved by the Fisheries AOS. Curricular requirements are purposely flexible, yet rigorous, to accommodate the diverse needs of students in fisheries science.

In addition, the following core courses are required:

6. A 400 or 600 level course from one of the other MEES AOSs (from an approved list, which can include 2, 4, and 5 above).
7. One course or seminar in Environmental Management (1 or 4 above satisfies this requirement; any such 3-4 credits course can satisfy 6 above).
8. A course in Statistics/Biostatistics (600 level for the Ph.D.; 400 level for the M.S.).
9. Courses in Experimental Design and Analysis and in Scientific Writing are strongly recommended.
10. One graduate level seminar for each year in residence (on average).

#### **G. Oceanography**

In the past decade, the University System of Maryland (USM) has emerged as a nationally and internationally recognized center for oceanographic research. Laboratories of the USM Center for Environmental Studies and at the College Park campus have been most active in this field. The current expertise in oceanography in the USM lies in the subfields of Biological and Physical Oceanography and the cross disciplinary studies of Marine biogeochemistry.

The expertise in Biological Oceanography includes water column nutrient cycling and trophic dynamics (comprising the entire pelagic food web and fishes) benthic ecology, and theoretical ecosystem analysis. The expertise in physical oceanography is in large scale flows and global circulation problems, estuarine and coastal circulations, mixing, transport and numerical modeling. Physical and biological oceanographers work closely together to understand the dynamics of estuarine, coastal, and ocean systems. It should be noted that there is also considerable strength in marine chemistry in the USM; some courses are available in the MEES Oceanography track, but the MEES track in Environmental Chemistry currently has a more diverse listing and greater program strength in this area.

Students in this AOS have access to extensive oceanographic facilities throughout the USM as well as the opportunity to work with some of the University's outstanding faculty in oceanography with global scale programs. Fundamental courses in the four major subfields of oceanography are required to provide interdisciplinary breadth, but a degree in the Oceanography AOS emphasizes the student's independent research. Students graduating from the Oceanography AOS can expect to find jobs in universities, oceanographic laboratories, government agencies, and consulting firms.

## Physical Oceanography

### Prerequisites

A bachelor's degree in a Physical Science, including:

1. Two semesters of Calculus.
2. Two semesters of Physics.
3. One or two additional advanced mathematics courses.
4. One or two additional advanced physical science courses.
5. Two semesters of Introductory Biology and/or Chemistry are highly recommended.

### Core Courses and Other Requirements (M.S. and Ph.D.)

1. One 3-credit course in Physical Oceanography (MEES 661 or equivalent).
2. One 3-Credit course in Biological Oceanography (MEES 621 or equivalent).
3. One 3-credit course in Chemical Oceanography (CHEM 723 or equivalent).
4. Two 3-credit courses in Oceanography or related fields (400 or 600 level) including:
  - a. One course in rotating fluid dynamics;
  - b. One course in non-rotating fluid dynamics.
5. A course in Statistics/Biostatistics (600 level for the Ph.D.; 400 level for the M.S.).
6. One course or seminar in Environmental Management, Ethics or Philosophy of Science.
7. One graduate level seminar for each year in residence (on average).
8. Courses in Experimental Design and Analysis and in Scientific Writing are also recommended.

## Biological Oceanography

### Prerequisites

A Bachelor's degree equivalent to the University of Maryland College Park undergraduate Biology degree, including:

1. Two semesters of Calculus.
2. Two semesters of Introductory Chemistry.
3. Two semesters of Organic Chemistry or Biochemistry.
4. Two semesters of Physics.
5. Two semesters of Introductory Biology.

### Core Courses and Other Requirements (M.S. and Ph.D.)

1. One 3-credit course in Physical Oceanography (MEES 661 or equivalent).
2. One 3-Credit course in Biological Oceanography (MEES 621 or equivalent).
3. One 3-credit course in Chemical Oceanography (CHEM 723 or equivalent).
4. Two 3-credit courses in Oceanography or related fields (400 or 600 level) including a recommended additional interdisciplinary course although MEES 661 can satisfy the MEES requirement for interdisciplinary breadth.
5. A course in Statistics/Biostatistics (600 level for the Ph.D.; 400 level for the M.S.).
6. One course or seminar in Environmental Management, Ethics or Philosophy of Science.
7. One graduate level seminar for each year in residence (on average).
8. Courses in Experimental Design and Analysis and in Scientific Writing are also recommended.

### **Course Offerings**

*(Note: Credit hours given in parentheses)*

#### *BIOL 600 Marine & Estuarine Ecology (4)*

Discussion topics include marine environment, adaptations of populations, structure of marine ecosystems, dispersion of marine organisms, migration, nutrition cycles, productivity and catches of fish, food chains and models of the sea. Prerequisite: An introductory Biology, Botany or Zoology course and a course in Ecology.

#### *BIOL 601 Environmental Microbiology (4)*

Topics include microbial ecology of plants and animals, aquatic microbial ecology (including medical implications), soil microbial ecology, biodegradation, microbial insecticides, gastrointestinal microbiology, microbiology of foods and management of environmental problems. Each student will be required to complete an independent research project. Prerequisite: General Microbiology

***BIOL 621 Environmental Endocrinology (3)***

Topics include impact of environmental factors on endocrine and neuroendocrine systems in various animal species; hormonal and adjustments to environmental stress; and review of pertinent scientific literature. Prerequisite: One year of Biology and one semester of Biochemistry.

***BIOL 633 Adaptations to the Marine Environment (3)***

Topics include physiological adaptation, perception of the environment, feeding and energy budgets, gases and respiration, circulation, reproduction and development. An independent research project is required. Prerequisite: One year of college Biology and one year of college Chemistry or permission of the instructor.

***BIOL 661 Community Ecology (4)***

This course is an in-depth study of the biology of communities with emphasis on factors that regulate abundance, diversity and stability of communities. Current theories on community dynamics will be combined with field experiences and detailed analyses of selected field projects.

***BIOL 662 Population Ecology (4)***

The course is an in-depth study of the biology of populations with emphasis on population structure, factors that regulate populations, and the effect of individual behavior on population characteristics. Field studies and computer simulations will explore selected areas of study.

***BIOL 681 Barrier Island Management (4)***

The course is an in-depth view of barrier island ecosystems and management problems in general, and Assateague Island National Seashore, in particular. Research design and problem-solving of actual problems facing the National Park Service will be emphasized.

***BIOL 683 Wildlife Management (4)***

Students will develop an understanding of the principles and practices associated with wildlife management. Emphasis will be placed on research design, sampling techniques, field research and statistical analyses. Students will practice field techniques during labs, analyze results and develop wildlife management recommendations as part of the semester project.

***BIOL 688B Ichthyology (4)***

This is an advanced course in ichthyology covering fish systematics, classification, phylogenetics, and evolution. Regional and global zoogeographic patterns of distribution of taxa will be discussed from both an historical and contemporary perspective. Emphasis is placed on comparative fish anatomy and taxonomy of local marine, estuarine and freshwater fishes and the field collection, handling and preservation of fishes. Prerequisite: An upper division graduate or undergraduate level course in general ichthyology, fish biology, fish ecology, physiology or behavior.

***BIOL 688F Fish Physiology (1-4)***

The course is an overview of fish physiology which fishery biologists and others can supplement with readings in current texts, reviews and research articles. Applicable points of general and comparative physiology are included. Summaries of important anatomic considerations are included where relevant, but the course is primarily for those who have

already completed courses in general physiology, chemistry, biochemistry and fish anatomy. It is an IVN offered course.

*CHEM 621 Advanced Environmental Chemistry (4)*

The origin, transport and effects of atmospheric and aquatic pollutants are studied, with emphasis on energy-related pollutants including coal, oil and synfuels. Prerequisites: One year of General Chemistry, one semester of Organic Chemistry and one semester of Analytical Chemistry or permission of the instructor.

*CHEM 632 Applied Water Chemistry (3)*

The course studies the chemistry of both municipal and industrial water treatment processing. Topics include water softening, stabilization, chemical destabilization of colloidal materials, ion exchange, disinfection, chemical oxidation and oxygenation reactions. Prerequisites: B.S. in Biology, Chemistry or Environmental Science. One year of undergraduate courses in Analytical Chemistry and Environmental Science. Permission of instructor required.

*CHEM 670 Advanced Biochemistry (3)*

The course covers the classification, chemistry and metabolism of protein, amino acids, carbohydrates and lipids. Prerequisite: One semester of Biochemistry.

*CSDP 604 Computer Methods in Statistics (3)*

The course is an introduction to principles and applications of probability and statistics needed in graduate studies in various academic areas and to computer realization of these methods. The course begins with a brief intensive review of basic statistical principles. Prerequisite: One semester of calculus.

*ENVS 437/637 Environmental Soil Chemistry (3)*

The course extends the concepts of chemistry and physics to the physical, chemical and biochemical characteristics of soil/water systems and their implications for managing contaminants, pesticides and agricultural inputs. Prerequisites: Senior standing or Graduate status. Co-Requisite: ENVS 438/638

*ENVS 438/638 Environmental Soil Chemistry Laboratory (2)*

This is a companion laboratory to ENVS 437/637. The course studies determination of soil properties such as salinity, pH and redox potential, organic matter content, surface area, carbonates and lime requirements, including quality assurance and GIS-based chemical data acquisition.

*ENVS 488/688 Coastal Ecology (3)*

This course provides an overview of ecological principles as they apply to coastal and estuarine environments. The major coastal ecosystems will be discussed and emphasis will be placed on sandy and rocky coasts, marshes, subtidal environments, coastal shelf systems and upwelling, sea grass beds, coral reefs and the rocky intertidal. The effects of detritus, primary and secondary biomass production, plankton, nekton, benthos, and fish stock production will be explored and related to physical processes of the coast. Graduate student credit will require the in-depth research of a topic relevant to coastal ecology and selected in consultation with the instructor. Once approved, the graduate student must research the topic, write a referenced report, and make an oral presentation to the class. Prerequisite: ENVS 201 General Oceanography; BIOL 201 Marine Zoology, or permission of the instructor.

#### *ENVS 611 Water Pollution (4)*

Biological, chemical and physical impurities in water with emphasis on agricultural, industrial and municipal waste pollution including acid mine drainage, detergents and eutrophication, thermal pollution, oil spills and other non-point source pollution will be studied. Further study will include the physical and biochemical processes for wastewater treatment, sludge handling and disposal and land disposal of wastewaters. Prerequisites: B.Sc. in Biology, Chemistry or Environmental Science. One year of undergraduate courses in Water Pollution and Environmental Science.

#### *ENVS 634 Air Pollution and Control (4)*

Classification of atmospheric pollutants and their effects on visibility, inanimate and animate receptors will be discussed. Evaluation of source emissions and principles of air pollution control, e.g., meteorological factors governing the distribution and removal of air pollutants, air quality measurements and air pollution control legislation will also be studied. Prerequisites: B.Sc. in Biology, Chemistry or Environmental Science. One year of undergraduate courses in Air Pollution and Environmental Science.

#### *ENVS 639 Sources and Effects of Pollutants (3)*

The course is a study of the sources, fate and effects of various toxic pollutants on man and the environment with emphasis on aquatic and atmospheric pollutants. Prerequisites: B.Sc. in Biology, Chemistry or Environmental Science with some background in environmental pollution or consent of the instructor.

#### *ENVS 641 Environmental Toxicology (3)*

Organisms in the atmosphere, hydrosphere and lithosphere and the effects of foreign chemical and other stress on their health and well-being will be discussed. Prerequisites: B.Sc. in Biology, Chemistry or Environmental Science with some background in environmental pollution or consent of the instructor.

#### *ENVS 660 Earth Science (4)*

This is an interdisciplinary course designed to show how geology, meteorology, physical geography, soil science, astronomy and oceanography are interrelated in the study of earth and its environment in space. Prerequisites: One year of Chemistry and one year of Physics.

#### *ENVS 684 Natural Resource Management (3)*

Topics include discussion of the availability, use, abuse, depletion and pollution of various natural resources humans need for their survival. The cost-benefit analyses and systems management concepts for natural resource conservation enabling us to save the 'earth' for future generations will be addressed. Prerequisites: B.S. in Biology, Chemistry, Environmental Science or Agricultural Sciences or consent of the instructor.

#### *PHYS 621 Physical Principles of Environmental Instrumentation (3)*

The course is a discussion of advanced physical concepts and their applications in instrumentation used in contemporary research. Construction details and the computer interfacing of selected instruments will also be discussed. Prerequisites: One year of Physics and one year of Calculus.



*MEES 608 MEES Seminar (1)*

This is repeatable credit with different topics.

*MEES 610 Experimental Design Seminar (1)*

The course is an exploration of research issues in experimental design. Seminar format includes student presentations and literature searches. Prerequisite: course in basic statistics or permission of instructor.

*MEES 698 Special Topics in MEES (1-3)*

This is repeatable credit with different topics.

*MEES 699 Special Problems in MEES (1-3)*

Special problems in areas related to the natural sciences, agriculture and nutrition are explored.

*MEES 799 Master Thesis Research (1-6)*

This is repeatable credit.

*MEES 899 Doctoral Dissertation Research (1-12)*

This is repeatable credit.

The following undergraduate courses are available for MEESgraduate students to take. No more than 12 credits of 400 level courses may be used towards the minimum 24 credits of course work required.

BIOL 402	Ecology
BIOL 420	Animal Histology
BIOL 431	Mammalogy
BIOL 436	General Endocrinology
BIOL 440	Plant Physiology
BIOL 441	Comparative Physiology
BIOL 451	Conservation Biology
BIOL 461	Invertebrate Zoology
BIOL 488	Wildlife Ecology
CHEM 401	Principles of Physical Chemistry I
CHEM 402	Principles of Physical Chemistry II
ENVS 411	Water Pollution & Purification
ENVS 434	Air Pollution
MATH 410	Mathematical Statistics

Graduate statistics options include AGSC 605 Statistics in Agricultural Research and CSDP 604 Computer Methods in Statistics. Variable credit MEES 688 experimental courses may be offered periodically with specialty topics of various faculty members.

**Facilities, State-Of-The-Art Equipment and Field Sites**

Excellent research laboratories exist on campus in the G. W. Carver Science Hall. Research laboratories are also located in Trigg Hall and on the campus farm (Department of Agriculture). For a listing of the laboratories and major equipment and the UMES MEES faculty, see the website: [www.umes.edu/sciences/mees/mees.html](http://www.umes.edu/sciences/mees/mees.html). UMES is uniquely

situated for studying marine and estuarine habitats. Students have access to the Chesapeake Bay and the Atlantic Ocean, as well as rivers, ponds and marshes.

### **External Support of Research Activities**

UMES faculty have received funding for research from a number of federal and state agencies and private organizations, including the National Science Foundation, National Institutes of Health, US Department of Agriculture, National Oceanic and Atmospheric Administration, US Department of the Interior, Environmental Protection Agency, Mid-Atlantic Fisheries Development Foundation, National Aeronautics and Space Administration, US Forest Service, Agency for International Development and the Maryland Department of Natural Resources.

### **UMES Combined B.S./M.S. Degree Program**

UMES offers a combined B.S./M.S. degree program in the Environmental Sciences area (Environmental Chemistry or Marine Science option). This is an accelerated program designed to enable students to obtain both the B.S. degree and the M.S. degree in five years. The curricula for the two degrees are administered under the auspices of the undergraduate Environmental Science Program and the graduate MEES program. The combined degree program offers an option or track in either Environmental Chemistry or Marine Science. This is an undergraduate admission into the B.S. degree program in Environmental Science, which allows for subsequent application for admission to the MEES graduate program in pursuit of the M.S. degree in Marine- Estuarine-Environmental Sciences.

### **MEES Program Time Limits**

- Full time Master's students will be limited to four years in which to graduate.
- Full time Doctoral students will be limited to 7 years in which to graduate. Students must be advanced to candidacy, i.e., taken and passed the written and oral comprehensive examination and the dissertation proposal defense, within 6 semesters after initial enrollment.
- Part-time Doctoral and Master's MEES students will follow the Graduate School's time limits for Master's degrees (5 years) and Doctoral degrees (5 + 4 years).
- An extension of these time limits may be granted upon request of the student's Research Advisory Committee, and with the approval of the MEES Program Director and the UMES Graduate Studies Dean.

### **For more information on this program, please contact:**

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Graduate Coordinator - MEES Program  
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Princess Anne, MD 21853  
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Website: [www.mees.umd.edu](http://www.mees.umd.edu)

## PSM, Quantitative Fisheries and Resource Economics

### **Objective of the Program**

Professional Science Master's (PSM) degree programs provide an alternate professional career path for bachelor's degree holders in the Science, Technology, Engineering and Mathematics (STEM) disciplines to help meet staff needs of industries, consulting firms and governmental agencies, and have been endorsed by the National Research Council (NRC 2008). The PSM program provides students with quantitative, communication and leadership skills and the knowledge required to obtain careers in natural resources, with a focus on fisheries management and conservation.

### **Admission Requirements**

The general admission requirements of the PSM degree program will be similar to those of other M.S. or Ph.D. programs in Science, Technology, Engineering, or Mathematics (STEM) disciplines at UMES. Applicants must have earned a bachelor's degree in any of these disciplines with a minimum cumulative GPA of 3.0 on a 4 point scale.

Application materials can be obtained online at [www.umes.edu/grad](http://www.umes.edu/grad) or, by calling 410-651-6507/8626/7966.

Applicants must complete:

- a) Application Forms.
- b) Certification of Finance Form (for international applicants only).
- c) Evaluation/Recommendation.
- d) Maryland Residency Status, and the Statement of Purpose Form.

Completed forms and a non-refundable application fee of US\$45.00 must be submitted to the UMES Graduate School. Domestic students must have their official transcripts sent directly by the issuing institution to the Graduate School. International students must visit [www.wes.org](http://www.wes.org) and request an evaluation of their official transcript to be sent to the Graduate School.

### **Application Deadlines**

- Fall Semester - April 15
- Spring Semester - October 30
- Summer Sessions - April 15

### **Program Degree Requirements**

The program provides the student with the knowledge and skills (quantitative, communication, leadership) needed to:

1. Conduct assessments of living marine resources;
2. Evaluate the impacts of alternative management actions, anthropogenic activities, and climate variability and change on yield, as well as the consequent socio-economic effects on fishermen.

The degree program requires completion of 37 credit hours for the Quantitative Fisheries Area of Concentration or 38 credit hours for the Resource Economics Area of Concentration. This includes a non-thesis research project to be completed as part of an internship. Of the 37/38 credit hours, 3 credits will be for a non-thesis research project, a component of the 3-month internship requirement. In addition, 3 credits will be for a Business Ethics course and 3 credits for a Personnel Development and Evaluation course. These will be used to fulfill the business

management and leadership training requirements of the program. The professional communications skills (effective oral presentation and scientific writing) component of the program will be acquired through a 3-credit graduate Scientific Communications course. Students will also submit reports of work done in partial fulfillment of science courses and the internship requirement. They will make oral presentations of their internship duties to faculty and students at the end of the internship experience.

A program of study will be developed by the Advisory Committee and approved by the Chairman of the Department of Natural Sciences. This may include prerequisites and required core courses. Although graduate courses taken elsewhere may serve to fulfill requirements, only six credits of such courses may be transferred. Transferable credit hours must be approved by the Chairman of the Department of Natural Sciences. Courses used to satisfy requirements for a previously awarded degree may not be used for credits.

### **Non-Thesis Option**

A non-thesis research project is completed as part of an internship.

### **Impact on Students' Technological Fluency**

Students in the Program will be required to be competent in scientific computer applications such as Excel to process scientific data, SigmaPlot to produce graphs, Microsoft PowerPoint for the development of quality presentations, Microsoft Publisher to create poster presentations, and Microsoft Word in the preparation of manuscripts. Students must also be proficient in performing literature searches online using various databases.

### **Expected Student Learning Outcomes**

1. To provide students with excellent theoretical knowledge and technical background in quantitative fisheries and resource economics.
2. To enhance the communications skills (oral and written) of the students.
3. To provide student leadership, project management and organizational skills.
4. To foster through internships and other projects the development of collaborative and teamwork skills.
5. To enhance student's knowledge of professional ethics.

### **Quality of Program and Support Faculty**

All graduate faculty members possess a terminal degree in an area of fisheries and/or resource or agricultural economics, and supporting areas. (\*Affiliate faculty from NOAA or University of Miami-RSMAS)

### **Course Requirements**

*(NOTE: Credit Hours are given in parentheses)*

Core Courses – Total of 19 Credit Hours - All students in the program are required to take these courses. (\*New courses)

#### ***BUAD 300 Business Ethics (3)***

The purpose of this course is to assist students in understanding ethical implications in the decision-making process and to assume their role as managers with a sense of a broader purpose impacted by moral consciousness. Concepts and principles are discussed in light of problem situations with ethical implications with a focus on the development of critical and analytical thinking. Prerequisite: Sophomore Standing.

#### ***MEES 642 Fish Population Dynamics & Stock Assessment (4)***

In this course, the effects of alternative management actions and environmental factors on the abundance and biomass of fish populations will be discussed. The course will begin with an overview of population modeling by reviewing essential mathematical concepts and biostatistics in the areas of algebra, beginning calculus, differential equation and descriptive statistics. Then, students will be taught the basic fish population characteristics and life histories including growth, mortality, fecundity, recruitment, biomass, and age structure. Finally, students will learn how to use various mathematical models to estimate population parameters and predict yield under different management scenarios. Topics to be covered include: estimation of fish abundance, population growth and mortality rates, stock identification and dynamics and stock recruitment relationships. Other topics to be covered are fish production models, catch at age analysis, and the problems in fisheries management.

*\*MEES 643 Risk and Decision Analysis in Natural Resources Management (3)*

This course will enable students to develop skills for managing natural resources with relevant decision frameworks reflecting uncertainty and risk about future events. The decision frameworks involve making tradeoffs across options and time using quantitative methods of risk assessment and decision analysis taking uncertainty into account. The course also considers the types of variability and risks faced by resource managers for several natural resources including forests, waters, wild life, and fisheries.

*MEES 688A Scientific Communications (3)*

This course is intended for graduate students in basic and applied sciences, and other technical disciplines such as engineering and technology. The course will address important writing concepts, content, organization, format, and style applied to professional scientific communications such as peer-reviewed manuscripts, science articles and reports for magazines, posters, proposals for funding agencies, theses, and dissertations. Topics such as oral presentations, ethics and research and publications, writing critiques of scientific articles and reports, and preparing cover letters, curriculum vitae, teaching and research statements for positions in academia and industries will also be covered.

*MEES 699 Special Problems: Internship Experience/Non-thesis project (3)*

Students will be required to complete an internship at any of the state or federal agencies or at an approved environmental or natural resources consulting firm. Interns will be required to spend up to 250 hours in order to earn 3 non-thesis project credits. Alternatively, students may complete fewer hours per week over an entire semester for a total equivalent of 3 months. A minimum of 150 hours of experience at an internship site is required. Students will work with potential supervisors at the internship site to develop a project based on mutual interest. Students will be required to write a proposal describing their internship duties that will be presented to faculty and students. Students will work with the internship supervisor to determine and complete a form that will list the tasks to be accomplished on a weekly basis. Deliverables will be sent to the Internship Supervisory Committee on a monthly basis. Interns will be required to prepare and submit reports on their projects at the end of their internships. A special symposium will be organized during which students will make oral presentations to fellow students and professors on their experiences and knowledge gained at the internship site.

*ORLD 617 Personnel Development, Management, and Evaluation (3)*

This course covers leadership strategies required in recruitment, development, and in-service effective use of personnel. It focuses on the evaluation techniques that promote a highly motivated personnel with a subsequent professional delivery system.

Quantitative Fisheries Science Concentration Required Courses – Total 18 Credit Hours (\*New courses)

*MBF 613 Population Dynamics (UM-RSMAS) (3)*

The objectives of the course are: 1) to introduce students to the theory and practice of the quantitative characterization of the processes that regulate, control and affect populations of harvested marine animals, and 2) to train students to use population dynamic models to answer resource management questions. Students will be expected to familiarize themselves with basic theories of marine population dynamics, including mathematical derivations of basic population models. They will understand the relative importance of different biological processes in explaining the dynamics of essential “population level” characteristics, and develop an understanding of the impact of fishing and the ecosystem on the dynamics of marine populations. Furthermore, students will learn to use statistical and modeling tools to develop hypotheses, estimate parameters, and make predictions about the dynamics of fished systems. They will acquire knowledge of the basic concepts required to support single species management, and the basic models that support current population assessment models. Finally, they will be able to explain the link between single species management and ecosystem management. The course objectives will be met by a combination of theoretical lectures, weekly assignments, and interactive computer sessions.

*MBF 614 Advanced Fisheries Modeling (UM-RSMAS) (3)*

This is an advanced population dynamics course that presents a synthesis of mathematical and computer-intensive models to assess and manage population (i.e., fish, shellfish, marine mammal and sea turtle) responses to exploitation. It covers a rigorous quantitative development of modeling concepts and stock assessment techniques including: stock production (surplus production), structured analytical yield (yield-per-recruit and age-size structured assessments), stock and recruitment, and, dynamic structured methods. Additionally, it will examine equilibrium and non-equilibrium approaches to data assimilation and parameter estimation, simulation modeling, decision theory, adaptive control, and risk assessment. Specific population modeling and resource allocation case studies from regional, federal and international fishery management institutions will be examined. The course has lecture and computer-based laboratory components.

*MBF 672 Bayesian Statistics (UM-RSMAS) (3)*

This course will cover Bayesian statistical methods from the theory to the practical use of statistics packages such as WinBUGS. Topics will include development of prior probability density functions, numerical methods for integrating posterior probability density functions, diagnostics of convergence, and methods for model selection and model averaging. Examples will be taken from marine science and will include Bayesian meta-analysis of life history parameters, fisheries stock assessment models, tag-recapture models, molecular biology, decision analysis and estimation of animal abundance from surveys.

*MEES 631 Fish Ecology (3)*

This course will examine the patterns of fish diversity. There will also be an analysis of the effects of environmental factors (abiotic and biotic) on the survival, growth, and reproduction of fish, as well as the evolution of life history patterns in fish. To be covered also will be aspects of population dynamics of fish including quantitative methods for estimating abundance, growth, mortality and production, and stock-recruitment relationships. There will also be discussions on the impacts of anthropogenic factors on essential fish habitat and fish.

*\*MEES 640 Introduction to Environmental and Resource Economics (3)*

Environmental and resource economics is the study of how economic forces and institutions affect the environment and are in turn affected by them. This course provides an introduction of major topics in the field, such as pollution, climate change, biodiversity, and fisheries. Students will learn basic market theory and the significance of market failures in the environmental context, and will study policy responses to these market failures, both the theory and the practice. Economics helps understand behavior and helps guide policy by identifying trade-offs, not by picking the best trade-off. The goal of the course is to make students aware of the importance of economics arguments they may encounter in the context of environmental policy discussions.

*\*MEES 641 Fisheries Survey Sampling (3)*

This course will train students in methods of estimating abundance, mean size, proportions, and other parameters of fish and wildlife populations. Students will learn theory and techniques for different sampling strategies including random, stratified, systematic, cluster, adaptive, regression and ratio estimators, as well as procedures for estimating variance, confidence intervals, relative error, and sample sizes for each method. Problems and examples will be based on real-world data sets drawn from marine fisheries research, with emphasis on trawls, dredges, traps, or video surveys, and will be analyzed using Microsoft Excel.

*\*MEES 644 Multivariate Statistics (3)*

Students will learn various types of multivariate statistical methods including, factor analysis, multidimensional scaling, and cluster analysis. Knowledge from this course will enable students to summarize data and reduce the number of variables necessary to describe the data. The use of Multivariate Statistics will allow students to analyze complex sets of data from their disciplines, determine if multiple independent variables exist in the data set; and, if the data set contains dependent variables that are correlated with one another.

*\*MEES 648 Ecosystem modeling for fisheries (3)*

This course is arranged so that students learn (or review) the basics of the traditional fisheries modeling and management methods and are introduced to the ideas of ecosystem-based management and modeling in the first week. Subsequent weeks build on the basics to more complex and realistic models. The first week is focused on traditional methods. These methods are rooted in population dynamics and harvest and tend to have a top-down view of the ecosystem. In Week 2, students are introduced to extended stock assessment methods building on what they learned in the first week. Some fisheries stock assessments now are beginning to incorporate environmental factors and other explicit sources of mortality (e.g., predation mortality) besides fishing and natural mortality. These approaches are basically top-down but with some potential bottom up factors affecting a population. In week 3, students will shift gears and focus on individual-based models that are focused on mostly bottom up effects – i.e. how physical features and habitat influence growth and reproduction of individual fish and how that extrapolates to the whole. Finally, in week 4, students would focus on whole ecosystem models, this framework allows the incorporation of bottom-up and top-down effects on a stock and an ecosystem. The model discussed in Week 1 and 2 are more suitable for tactical management; the models discussed in Weeks 3 and 4 are more suitable for strategic management.

## Resource Economics Concentration Required Courses – Total 19 Credit Hours (\*New courses)

### *\*MEES 647 Research Methods in Env. & Natural Resources Economics (3)*

This course will cover the practice and methods of applied research in environmental and natural resources economics. Topics include philosophical foundations, research project design, reporting research results, and criticism of proposals and research papers. This course is specifically designed for students who are majoring in fisheries and resource economics, but is open to any student interested in research methods.

### *\*MEES 649 Economics of Renewable Resources (3)*

This course intends to provide theoretical framework of natural resource economics. It will cover the major areas of renewable resources including the use and conservation of forest, marine and mineral resources, and the valuation of renewable resource assets. There will be several reading materials assigned for each lecture.

### *\*MEES 650 Econometrics (4)*

This course is an introduction to the use of multiple regression methods for analyzing data in economics and related disciplines. It addresses the multivariate analysis of quantitative data at the intermediate level. The primary focus is to use statistical packages for calculating multivariate statistics and the utilization of the statistical output in research findings.

### *\*MEES 652 Marine Resource Policy (3)*

Coastal estuarine and marine systems are some of the most biologically dynamic systems in the world serving as nursery grounds for many of the nation's important recreational and commercial fisheries. These systems are also some of the most attractive as areas for urban and suburban development as such highly sensitive to anthropogenic effects. Many of the marine fisheries whose young utilize coastal systems for development and growth are significantly impacted by environmental declines which reduce recruitment to offshore marine stocks. Add to this the demands for fish, shellfish and plant products from the sea which have also significantly impacted the fisheries and offshore ecosystems there comes a need for a concerted look at how marine resource policy is developing and how it will be implemented. In addition the potential economic value of offshore marine areas is not confined to biological resources and is now being explored as areas for energy production (tidal and wind generators), oil exploration, military uses, reefs for attracting fish and so on. It is highly likely that like zoning practices on land our coastal aquatic areas will also be subject to development of exclusive rights and zoning for specific purposes. The intent of this course is to inform the student of the current and proposed uses for our estuarine and marine areas, the sciences that are needed to develop the information that is to be used in policy development and how marine policy is being developed and in some cases how it should be developed.

### *\*MBF 672 Bayesian Statistics (3)*

This course will cover Bayesian statistical methods from the theory to the practical use of statistics packages such as WinBUGS. Topics will include development of prior probability density functions, numerical methods for integrating posterior probability density functions, diagnostics of convergence, and methods for model selection and model averaging. Examples will be taken from marine science and will include Bayesian meta-analysis of life history parameters, fisheries stock assessment models, tag-recapture models, molecular biology, decision analysis and estimation of animal abundance from surveys.



**For further information please contact:**

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## M.S., Ph.D., Toxicology

### **Objective of the Program**

UMES offers graduate programs leading to the degrees of Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) in Toxicology. The mission of the Toxicology Program is to provide educational and professional training in mechanistic and applied fields of environmental and mammalian toxicology. Graduates of the Toxicology Program will conduct research, teach, and provide technical support to federal, state, and local governments, industry, and public interest groups in areas including: evaluation and testing of harmful effects of chemical, physical, and biological agents on living organisms, mechanisms of toxicity, prevention of chemical induced diseases, risk assessment, and environmental protection through governmental regulations for the control and monitoring of hazardous chemicals.

There are four formally defined Areas of Specialization (AOS), within the Toxicology Program from which a student may choose as follows:

- 1- Chemical Carcinogenesis.
- 2- Analytical Toxicology.
- 3- Neurotoxicology.
- 4- Molecular & Mechanistic Toxicology.

### **General Information and Program Overview**

The UMES Toxicology Program is part of the University System of Maryland's (USM) Program which encompasses faculty and resources on the campuses in Baltimore, College Park, Baltimore County, the Eastern Shore, and the Chesapeake Biological Laboratory of the USM Center for Environmental Science. Courses taught at USM campuses may be available to Toxicology Program students through inter-institutional enrollment.

Applicants and enrollees into the program should consult the Toxicology Program website for additional information and details of the Toxicology Program which are not covered in this section of this Catalog, and for any updates to the program after the time of printing. The comprehensive website for the Toxicology program (all participating units) is: [www.medschool.umaryland.edu/departments/epidemiology/grad\\_tox.html](http://www.medschool.umaryland.edu/departments/epidemiology/grad_tox.html)

### **Admission**

Beyond the Graduate School's minimum admission requirements, applicants should have earned a B.S. or BA in Chemistry, Biology, Pharmacy, or a related field. Students are expected to have completed the following courses or equivalents:

- 1- Cell and molecular biology;
- 2- Organic chemistry;
- 3- Physical chemistry;
- 4- Quantitative analysis;
- 5- Calculus;
- 6- Two semesters of undergraduate or graduate level biochemistry; and
- 7- One semester of undergraduate or graduate level physiology.

Specific requirements include a minimum cumulative GPA of 3.0 on a 4.0 scale, GRE scores should be at least at the 50th percentile for the verbal reasoning and quantitative reasoning, and at least a 4.0 in the analytical writing section and a minimum internet based TOEFL score of 55 or computer based TOEFL score of 213.

Applicants to the Toxicology Program will be considered at both the M.S. and Ph.D. levels. In the event an applicant to the Ph.D. track has only a BA or B.S. degree, admission may initially be to the M.S. track with the final acceptance to the Ph.D. track contingent on successful completion of a probationary period (usually one year) and on the recommendation of the student's Research Advisory Committee.

An Admissions Committee has been established to evaluate the applications of prospective students based on the following criteria:

- 1- Applicant's research interests must be clearly stated and relevant to one or more of the Toxicology Program's AOS.
- 2- The academic preparation of the applicant must be consonant with stated interests and AOS requirements.
- 3- The undergraduate cumulative GPA must be at least 3.0 on a 4.0 scale.
- 4- Applicants must submit the following required documents as part of their application for graduate study in the Toxicology Program:
  - (a) GRE Scores (Only the General Test is required, although one of the Advanced Tests is strongly recommended).
  - (b) Official college transcripts.
  - (c) A brief essay clearly defining areas of research interest within the offered AOS. The essay will assist with identification of an Academic Advisor should the applicant be judged admissible.
  - (d) Three letters of recommendation from persons familiar with the academic/research work of the applicant.

Receipt of the application will initiate the search for an appropriate faculty member to serve as the academic advisor for the student. No student will be admitted to the Toxicology Program for whom an advisor has not been identified. Hence, if prior discussions have taken place between an applicant and a member of the faculty regarding that faculty member's service in an advisory capacity, that fact should be stated in the application and the faculty member should forward a letter of agreement to the Dean of Graduate Studies at UMES.

### **Application Deadlines**

#### Domestic

- |                 |               |
|-----------------|---------------|
| Fall Semester   | – February 1  |
| Spring Semester | – September 1 |

#### International

- |                 |              |
|-----------------|--------------|
| Fall Semester   | – December 1 |
| Spring Semester | – June 1     |

## **Advisors and Research Advisory Committees**

Upon admission to the Toxicology Program, students will be assigned to an academic advisor. Any request for a change of advisor must be submitted to and approved by, the Toxicology Program Committee and the Toxicology Program Coordinator.

In certain situations, a student may request a second academic advisor. This might happen if, for instance, the professor most familiar with the student has only an Associate Graduate Faculty status. In this case, it is possible to set up a co-advisor team of two professors who jointly serve in the role of advisor (the other having Regular Graduate Faculty status).

Due to the expected divergent interest and goals of students in the Toxicology Program, as well as the dispersion of campuses and laboratories, the early formation of a Research Advisory Committee (RAC) is mandatory. During the first semester of enrollment in the Toxicology Program, the student and the advisor must form this committee and submit its membership to the Toxicology Program Committee for approval. The RAC should meet during the first semester, and must make its written recommendations for a program of study before the end of the second semester.

A Master's RAC will consist of three members, all of whom must be Regular or Associate members of a University System of Maryland (USM) campus Graduate Faculty. A Ph.D. RAC must have five members, three of whom must be Regular or Associate faculty. The Ph.D. RAC can consist of a minimum of three members who are USM graduate faculty until the Comprehensive Examinations, at which time it must have all five members. The student's Advisor will serve as Chair of this Committee. The membership of the RAC should not be drawn entirely from a single laboratory or department. Replacement of Committee members is expected, as needed, based on the Advisor's recommendation.

The program of study will be planned by the RAC in the first or second semester and will include any missing prerequisites (all prerequisites must be completed within the first year in the program), all required core courses, and any specialized courses the Committee thinks the student needs. Total required and suggested courses will often exceed the general credit minimum (36 for M.S. and 42 for Ph.D.). The program of study must then be approved by the Toxicology Program Committee.

The RAC is responsible for initial approval of the student's area of research. Once the student has chosen an area of research, a proposal should be written and disseminated to the RAC. This preliminary research proposal should be brief, yet concisely state the student's research interests. Students in the Ph.D. track will later develop a more comprehensive research proposal which they must defend before advancement to candidacy. Students in the M.S. track will develop a more complete thesis proposal to submit to their RAC as described below. The approved preliminary proposal should be filed with the Toxicology Program Coordinator by the end of the second semester following entry into the Toxicology Program.

An M.S. student's RAC will approve the thesis proposal and the thesis defense. Master's thesis students are not required to take comprehensive examinations. For Ph.D. students, the RAC will administer the defense of the dissertation proposal, oversee the student's research, and administer the dissertation defense.

Annual progress reviews initiated by the advisor will be conducted through the Toxicology Program Committee and the Coordinator to ensure satisfactory progress of Toxicology students toward degree completion (coursework and research direction).

## **Toxicology Degree Requirements**

The Toxicology Program course curriculum is designed to provide essential core knowledge in Toxicology, together with elective courses that offer students the opportunity to specialize in their area of interest.

### **Course Curriculum**

All students must attain a grade B or better in all required courses. A student receiving a grade C or less in a required course must retake that course, or equivalent.

#### *Course Requirements for M.S. (thesis option)*

*(Note: Credit hours given in parentheses)*

(a) 15 Credits in Toxicology

TOXI 601 Advanced Toxicology I (3)

TOXI 602 Advanced Toxicology II (3)

TOXI 688G Advanced Molecular Toxicology (3)

TOXI 697 Graduate Toxicology Seminar (1 cr, repeatable 3 times) (3)

ENVS 603 Ecotoxicology (3)

(b) 6 Credits of Biochemistry / Genetics

Biochemistry (Choose from the following):

CHEM 670 Advanced biochemistry I (3)

CHEM 672 Carbohydrate Chemistry (3)

Genetics: TOXI 688D Molecular Genetics and DNA Damage (3)

(c) 3 Credits in Statistics (Choose from the following):

TOXI 788A Biostatistics (3)

CSDP 604 Computer methods in statistics (3)

(d) 6 Credits in Elective Courses (student's choice – could be from “Suggested Electives” list below)

**Suggested Electives**

TOXI 688F Pathology of Toxicological Compounds (3)

TOXI 688L Endocrine Toxicology (3)

TOXI 688 Methods in Toxicology (1 cr, repeatable 3 times)

CHEM 671 Special Topics in Biochemistry (3)

CHEM 690 Principle of Chemical Separation (3)

FDST 802 Advanced Food Toxicology (3)

CHEM 621 Advanced Environmental Chemistry (3)

ENVS 622 Solid and Hazardous Waste Management (3)

(Other UMES and UMB electives as available)

In addition to these courses, student will need 6 credits of TOXI 799 Master Thesis Research to graduate.

Course Requirements for M.S. (non-thesis option)

(Note: Credit hours given in parentheses)

(a) 15 Credits in Toxicology

- TOXI 601 Advanced Toxicology I (3)
- TOXI 602 Advanced Toxicology II (3)
- TOXI 688G           Advanced Molecular Toxicology (3)
- TOXI 697 Graduate Toxicology Seminar (1 cr, repeatable 3 times) (3)
- ENVS 603 Ecotoxicology (3)

(b) 6 Credits of Biochemistry / Genetics

Biochemistry (Choose from the following):

- CHEM 670 Advanced biochemistry I (3)
- CHEM 672 Carbohydrate Chemistry (3)

Genetics: TOXI 688D Molecular Genetics and DNA Damage (3)

(c) 3 Credits in Statistics (Choose from the following):

- TOXI 788A Biostatistics (3)
- CSDP 604 Computer methods in statistics (3)

(d) 6 Credits in Elective Courses (student's choice – could be from "Suggested Electives" list below)

Suggested Electives

- TOXI 688F Pathology of Toxicological Compounds (3)
- TOXI 688L Endocrine Toxicology (3)
- TOXI 688 Methods in Toxicology (1 cr, repeatable 3 times)
- CHEM 671 Special Topics in Biochemistry (3)
- CHEM 690 Principle of Chemical Separation (3)
- FDST 802 Advanced Food Toxicology (3)
- CHEM 621 Advanced Environmental Chemistry (3)
- ENVS 622 Solid and Hazardous Waste Management (3)
- (Other UMES and UMB electives as available)

Course Requirements for Ph.D.

(Note: Credit hours given in parentheses)

(a) 15 Credits in Toxicology

- TOXI 601 Advanced Toxicology I (3)
- TOXI 602 Advanced Toxicology II (3)
- TOXI 688G Advanced Molecular Toxicology (3)
- TOXI 697 Graduate Toxicology Seminar (1 cr, repeatable 3 times) (3)
- ENVS 603 Ecotoxicology (3)

(b) 6 Credits of Biochemistry / Genetics

Biochemistry (Choose from the following):

- CHEM 670 Advanced biochemistry I (3)
- CHEM 672 Carbohydrate Chemistry (3)

Genetics: TOXI 688D Molecular Genetics and DNA Damage (3)

(c) 3 Credits in Statistics (Choose from the following):

TOXI 788A Biostatistics (3)

CSDP 604 Computer methods in statistics (3)

(d) 6 Credits in Elective Courses (student's choice – could be from "Suggested Electives" list below)

**Suggested Electives**

TOXI 688F Pathology of Toxicological Compounds (3)

TOXI 688L Endocrine Toxicology (3)

TOXI 688 Methods in Toxicology (1 cr, repeatable 3 times)

CHEM 671 Special Topics in Biochemistry (3)

CHEM 690 Principle of Chemical Separation (3)

FDST 802 Advanced Food Toxicology (3)

CHEM 621 Advanced Environmental Chemistry (3)

ENVS 622 Solid and Hazardous Waste Management (3)

(Other UMES and UMB electives as available)

In addition to these courses, student will need 12 credits of TOXI 899 Master Thesis Research to graduate

**Thesis Defense**

An oral defense of the thesis, administered according to Graduate School procedures, will take place at the completion of the research project. This defense will be conducted by the RAC and will be administered once all other degree requirements have been fulfilled. The RAC also approves the thesis. It is the candidate's obligation to see that each member of the Committee has at least *two weeks* in which to examine a copy of the thesis prior to the time of the defense. The RAC may conclude that the candidate has passed or failed. A student may be conditionally passed with the provision that minor changes in the thesis be made by the student and approved by the major advisor. A student who fails may, at the discretion of the Committee and the UMES Graduate Studies Dean, be permitted to stand a second defense after acting on suggestions for improvement of the thesis (e.g., collection of more data, use of different statistical analysis, rewriting of the discussion, etc.), at such time as the advisor considers appropriate. Once the thesis has been successfully defended, copies required by the Graduate School must be submitted.

**Examinations**

Formal application for advancement to candidacy for the Doctoral degree requires successful completion of both a written comprehensive examination and an oral defense of the dissertation proposal. The written comprehensive examination must be passed before the student can defend the dissertation proposal.

*a. Comprehensive Examination*

The RAC is responsible for administering the written comprehensive examination. This examination must be successfully completed before the dissertation proposal can be defended. The exam must be taken by the end of the student's fifth semester. This examination is intended to determine whether the student demonstrates sufficient evidence of scholastic and intellectual ability in major and related academic areas. The examination will not be a defense of the research proposal. The RAC will determine whether the student passes (a minimum of four affirmative votes is required), or fails. If failed, the examination may, at the recommendation of the RAC, be taken again. In this case, the examination should

be repeated within one year, but no sooner than six months, after the initial examination. If the examination is failed a second time, admission will be cancelled. Any conditional passing of the examination must be satisfied before the examination can be rendered "successfully completed".

The USM interactive video network system may be used for dissertation proposal defenses but all Committee members, the student and the Graduate Studies Dean must agree to this use. Phone/conference calls are not acceptable alternatives.

*b. Dissertation Proposal Defense*

The proposal defense is an oral examination on the research proposal administered by the RAC. At least two weeks prior to the examination, the student must supply the Committee members with a formal research proposal which includes: background information, research progress to date (if any), specific objectives, and experimental design of the proposed research. The RAC is expected to examine the student on all aspects of the proposed research to determine whether the research plan is sound, whether the student has the proper motivation, intellectual capacity and curiosity, and has, or can develop, the technical skills necessary to successfully pursue the Ph.D. degree. The student passes if there are at least four affirmative votes. If failed, the student must re-defend the proposal within one year; a second failure will result in cancellation of admission.

The research proposal should be defended within one year of unconditionally passing the written comprehensive examination and at least one year before projected completion of the degree requirements.

At the successful completion of this defense, the student officially applies for *Advancement to Candidacy for the Ph.D. Degree* and should submit the necessary form to the UMES Graduate School. Students must be admitted to candidacy at least six months prior to the defense of the dissertation (final oral defense).

*c. Dissertation Seminar & Defense of the Dissertation Research*

A candidate for the Ph.D. degree will present a public seminar on his/her dissertation research during the academic year in which the degree will be awarded. The seminar should, under normal circumstances, be given within five weeks in advance of the day of the oral final examination. The student and the advisor will be responsible for initiating arrangements for the date and advertisement of the seminar. The seminar will be open to faculty, students, and other interested parties.

The final oral defense of the dissertation is conducted by a Committee of the graduate faculty appointed by the Graduate Studies Dean (this is usually the RAC plus a Graduate Studies Dean's representative). Nominations for membership on this Committee are submitted on the designated form to the UMES Graduate School by the student's advisor. This is done by the third week of the semester in which the student expects to complete all requirements, but no sooner than two months prior to the defense (see the UMES Graduate School's calendar for commencement schedule). The time and place of the examination are established by the Chair of the Committee. The student is responsible for distributing a complete, final copy of the dissertation to each member of the Committee at least two weeks before the examination date. Announcement of the final examination will be made to all members of the Toxicology faculty at least two weeks prior to the examination. All final oral examinations are open to all members of the graduate faculty and students, although only members of the Examining



Committee may question the candidate. After the examination, the Committee deliberates and votes in private. Two or more negative votes constitute failure. The student may be examined no more than twice. Following successful completion of the final examination, copies of the dissertation required by the Graduate School must be submitted.

### **Core Courses**

*(Note: Credit hours given in parentheses)*

#### ***TOXI 601 & 602 Toxicology (3 + 3)***

A two-semester course covering basic principles of toxicology and mechanisms by which chemicals cause diseases and environmental damage. Topics include target organ toxicity, major classes of toxic agents, and mechanisms of cell injury and cell death. The course is offered in sequence in fall and spring semesters.

#### ***TOXI 688G Advanced Molecular Toxicology (3)***

This course will provide areas of toxicology where significant advances are being made on molecular mechanisms. Emphasis's on alterations in function caused by xenobiotics, and by genetic and metabolic diseases. The course will focus on new advances in biochemical and molecular biological experimental techniques that would help understand the precise effects of xenobiotics on living organisms at the molecular, cellular, and organismal levels. Emphasis on linking molecular pathways to more general biomedical context.

#### ***TOXI 697 Graduate Seminar in Toxicology (1, repeatable 3 times)***

Seminar in toxicology is a course in seminar format highlighting current topics in toxicology. The students will study and critique different research papers. They will also be required to present a seminar and submit a report on a seminar topic preferably in the area of concentration of their study. Course is repeatable for credit a maximum of 3 times at 1 credit each for a total of 3 credits.

#### ***ENVS 603 Ecotoxicology (3)***

This course cuts across traditional subject boundaries by integrating different disciplines such as chemistry and biochemistry through ecology and statistics. It provides students with a distinct approach for solving marine environmental pollution issues stemming from stable pollutants and how they interact with biotic and abiotic components of the marine ecosystem. Prerequisites: CHEM 112, CHEM 211, BIOL 112, Math 210

#### ***CHEM 670 Advanced Biochemistry (3)***

The course covers the classification, chemistry and metabolism of protein, amino acids, carbohydrates and lipids. Prerequisite: one semester of biochemistry.

#### ***CHEM 672 Carbohydrate Chemistry (3)***

This course is an advanced course on carbohydrates. The course will cover the structure, synthesis and biological function of carbohydrates as well as the clinical and commercial value of carbohydrates. The course will involve detailed studies of the structures and cellular functions of carbohydrates and glycoconjugates of plants and animals. The course will place special emphasis on techniques for the analysis and biosynthesis of complex carbohydrate structures and the relevance of the techniques to biomedical research. The major part of the course material will be based on current research findings in carbohydrate chemistry. Students will be required to read and write papers on current research findings on selected topics on carbohydrates.. An oral presentation is required.

*TOXI 688D Molecular Genetics and DNA Damage (3)*

This course will cover the details of genetic processes and will place a heavy emphasis on experimental approaches that enable a scientist to understand genetic analysis.

*CSDP 604 Computer Methods in Statistics (3)*

This course is an introduction to the principles and applications of probability and statistics needed in graduate studies in various academic areas and to the computer realization of these methods. The course begins with a brief intensive review of basic statistical principles. Prerequisites: One semester of calculus.

*TOXI 788A Biostatistics (3)*

The material in this course requires no mathematical competence beyond very elementary algebra, although the discussions include many topics that appear seldom in other general texts. Literature references and footnotes are given to provide support for material discussed. The data in the examples and exercises are intended to demonstrate statistical procedures, not to present actual research conclusions. The sample sizes of most examples and exercises are small in order to enhance the ease of presentation and computation. Basic principles and aspects of the statistical procedures are presented to show results may be obtained, so that the biologist should be informed enough to interpret properly the computational results.

*TOXI 799 Thesis Credit (1-6)*

This is repeatable credit.

*TOXI 899 Dissertation Credit (1-12)*

This is repeatable credit.

**Elective Courses**

*(Note: Credit hours given in parentheses)*

*TOXI 688F Pathology of Toxicological Compounds (3)*

This course is intended for students with toxicology at the graduate level. The course will examine a series of topics that are important for students in toxicology to learn, and provide a group of technical skills needed to use their career. Topics will range from basic concepts of pathology, to modes of action for classes of compounds as well as specific compounds as is appropriate. In addition the course will provide a suite of methods that are used by forensic pathologists in toxicological pathology. Prerequisite: Graduate Status Only.

*TOXI 688L Endocrine Toxicology (3)*

The course will focus on the main concepts relative to the mechanisms of hormone action. The course will provide discussions on the importance of hormones in regulating organism functions; integrating biological and environmental systems; protecting the organism from stress, disease, and environmental agents; and, maintaining day-to-day organism life processes. Course concepts will be supported with applicable case-studies.

*TOXI 609 Methods in Toxicology (1)*

Students become familiar with laboratory methods used by faculty members to study the effect of toxins and environmental pollutants on living systems. The course is repeatable credit. Permission and credit are arranged individually.

*CHEM 621 Advanced Environmental Chemistry (4)*

The origin, transport, and effects of atmospheric and aquatic pollutants are studied, with emphasis on energy-related pollutants including coal, oil and synfuels. Prerequisites: One year of general chemistry, one semester of organic chemistry and one semester of analytical chemistry or permission of the instructor.

*ENVS 622 Solid and Hazardous Waste Management (3)*

The course introduces fundamentals of solid and hazardous waste management that include their source, characterization, collection, transportation, storage and final disposal. It also deals with resource recovery and utilization, risk assessment, biological, physical and chemical waste treatment methods/technologies and various waste legislation and implementation. The course includes field trips to landfills, recycling facilities and waste-to-energy facilities. A project paper and oral presentation are required. Prerequisite: Graduate standing in the Science or Engineering.

*FDST 802 Advanced Food Toxicology (3)*

This course emphasizes biological and chemical aspects of toxicology, microbial aspects of food borne infections and intoxications, food additives, toxic substances occurring in food, either naturally or formed during processing, and the toxic effects of these substances on the biological systems. Safety of genetically engineered foods, risk assessment and food safety policy will be discussed as general topics. Prerequisite: permission of instructor.

*TOXI 607 Forensic Toxicology (3)*

Lectures include discussion of principles underlying forensic and clinical toxicology, mechanism of action of drugs and other poisons, methods of detection and quantitation of drugs and poisons in tissues and body fluids, and interpretation of analytical procedures for the detection and estimation of drugs and chemicals in biological samples. The course is offered fall semesters in even-number years.

*TOXI 611 Exposure, Risk and Public Health (2)*

This course is open to graduate students in toxicology, epidemiology, public health, nursing and related fields of interest.

*TOXI 615 Toxic Cell Injury (2)*

Lectures will concern the mechanisms of cell injury from toxic agents and the integration of ideas from TOXI 601 and 602 and use a cell biology approach to understanding how organic and inorganic toxicants produce cellular damage.

*TOXI 620 Joint Environmental Law-Toxicology Seminar Series on Special Topics (2)*

This course examines real-world problems involving toxic chemicals from both the legal and scientific perspectives. Law and toxicology students work as teams to develop innovative approaches to solving complex problems of regional and national interest. Topics include the effects of toxic chemicals on the Chesapeake Bay and public health problems associated with lead exposure.

*TOXI 625 Principles of Aquatic Toxicology (3)*

The course covers toxicology testing methods, chemical disposition in aquatic species,

metabolism, and biochemical effects at the subcellular level. Consideration will be given to the effects and mechanisms by which chemicals produce toxic effects in aquatic organisms. The course is offered spring semesters.

#### *TOXI 675 Reproductive and Developmental Toxicology (2)*

This course provides an overview of normal and abnormal male and female reproduction as well as embryo, fetal, and neonatal development. Regulatory toxicology issues, in particular the risk assessment process, are discussed.

#### **Facilities, Instrumentation and Field Sites**

State-of-the-art research facilities and instrumentation are found in G.W. Carver Hall, Richard Hazel Hall and Trigg Hall on the UMES Campus.

#### **External Support of Research Activities**

UMES faculty have received funding for research from a number of federal and state agencies and private organizations including: National Science Foundation, National Institutes of Health, US Department of Agriculture, National Oceanic and Atmospheric Administration, US Department of the Interior, Environmental Protection Agency, Mid-Atlantic Fisheries Development Foundation, National Aeronautics and Space Administration, US Forest Service, Agency for International Development and the Maryland Department of Natural Resources.

#### **Toxicology Program Time Limits**

- Full time Master's students will be limited to four years in which to graduate.
- Full time Doctoral students will be limited to 7 years in which to graduate. Students must be advanced to candidacy, i.e., taken and passed the written and oral comprehensive examination and the dissertation proposal defense within 6 semesters after initial enrollment.
- Part-time Doctoral and Master's Toxicology students will follow the Graduate School's time limits for Master's degrees (5 years) and Doctoral degrees (5 +4).
- An extension of these time limits may be granted upon request of the student's RAC, and with the approval of the Toxicology Program coordinator and the UMES Graduate Studies Dean.

#### **For additional information on the program, please contact**

Ali Ishaque, Ph.D.,  
Toxicology Program Coordinator at UMES  
Carver Hall, Department of Natural Sciences  
University of Maryland Eastern Shore  
Princess Anne, MD 21853  
Email: [abishaque@umes.edu](mailto:abishaque@umes.edu)

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## Department of Criminal Justice

### **Degree Offered**

Master of Science (M.S.), Criminology and Criminal Justice

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### **M.S., Criminology and Criminal Justice**

#### **Objectives of Program**

The Master of Science in Criminology and Criminal Justice (MCCJ) is a program designed to produce quality-based and critically-oriented scholars in criminology and criminal justice, with an in-depth knowledge of the functioning of the criminal justice system. The Criminology and Criminal Justice Program is interdisciplinary and seeks qualified students with baccalaureate degrees in criminal justice and other disciplines as well as professionals in the field who desire to further their degrees in criminal justice. The program also prepares students for Doctoral work in the discipline. Graduate education in Criminal Justice at UMES, the only such program on the Eastern Shore of Maryland, will be useful to criminal justice agencies in the state. Graduate education in the discipline has become the generally sought academic experience for optimum performance within the criminal justice system.

The major objectives of the Master of Science in Criminology and Criminal Justice are to:

1. Enhance students' knowledge in criminology and criminal justice with the potentialities and opportunities for Doctoral work and advancement of this body of knowledge.
2. Provide students with the skills to engage in original and independent scholarly research in criminology and criminal justice.
3. Enhance students' capacity to critically evaluate the criminal justice system and to hold management and research positions in the public and private sectors.
4. Increase students' knowledge of qualitative and quantitative research in criminology and criminal justice and provide them with the necessary skills to be effective researchers, program evaluators, consultants in the field, and users of existing criminological research data.
5. Assure that students acquire an understanding of an integrative minority perspective in criminological thought.
6. Increase students' knowledge and appreciation of various theoretical explanations of criminal behavior.

## **Description of the Program**

All Master's degree students are required to take five core courses (MCCJ 600, 620, 625, 631, 640). A grade of "B" (3.0) or better must be achieved in each core course. Each Master of Science degree student may specialize in one concentration area. These include Criminology and Research (CR), Law Enforcement and Courts (LEC), and Corrections and Delinquency Prevention (CDP). The Master of Science degree is granted upon completion of one of two program options.

### Thesis Option

The thesis option requires the successful completion of twenty-four (24) semester hours of course work and a minimum of six (6) hours of credit on an original thesis. This research-oriented option of thirty (30) credit hours is designed for students who anticipate pursuing their academic career to the Doctoral level. Students electing this option must form a Thesis Committee. A minimum committee consists of a major professor and two additional faculty members, all of whom must be a UMES graduate faculty member. The major professor and one member of the Thesis Committee should be selected from the Department of Criminal Justice Faculty. The third Committee member must be selected from campus approved graduate faculty. A successful oral defense of the thesis is required. Students are encouraged to review the department's Comprehensive Examination-Thesis Policy prior to beginning work on the thesis.

### Course Work Option

The course work option requires that the student completes thirty-six (36) credit hours of course work. This option does not require completion of a major paper.

## **Structure of the Program**

### Core courses include the following:

*(NOTE: Credit Hours are given in parentheses)*

MCCJ 600	Proseminar in Criminology and Criminal Justice (3)
MCCJ 620	Theoretical Perspectives on Crime and Justice (3)
MCCJ 625	Research Methods in Criminology and Criminal Justice (3)
MCCJ 631	Applied Statistics in Criminology and Criminal Justice (3)
MCCJ 640	Minorities, Crime, and Justice (3)

### Areas of concentration

Criminology and Research - CR

Law Enforcement and Courts - LEC

Corrections and Delinquency Prevention - CDP

### Thesis Option - Minimum of 30 credit hours

- Core courses – 15
- Concentration courses – 6
- Electives – 3
- Thesis – 6

### Non-Thesis Option (Course Work) -Minimum of 36 credit hours

- Core courses – 15
- Concentration courses – 18
- Electives – 3

### **Graduate Student Responsibility (Thesis Option)**

Each student will select a major professor according to his/her area of concentration. Major professors must be selected from the faculty of the Criminal Justice Department who are associate/regular members of the UMES Graduate Faculty. The student, in consultation with his/her major professor, selects the Thesis Committee. The Committee includes a major professor from the Department of Criminal Justice and two other faculty members, one of whom must come from the Criminal Justice Department. A student may select an associate or regular member of the Graduate Faculty from another discipline.

Thesis option graduate students are responsible for all aspects of the preparation of the thesis, including the following:

1. Subject matter and content.
2. Organization and format.
3. Editorial, linguistic and bibliographic quality.
4. Quality of text, illustrations and duplication.
5. Quality of data, evidence and logical reasoning presented.
6. Proper processing and submission of the final copies of the document to the graduate school.

### **The Thesis Advisory Committee's Responsibility**

The Chair and to a lesser extent, the other members of the Advisory Committee, are responsible for the following aspects of the thesis and the related or associated research experience:

1. Approval of the subject matter and methodology of the thesis research.
2. Approval of the organization, content and format of the thesis,
3. Review of and comment on drafts of various aspects of the thesis.
4. Evaluation of the thesis as a basis for certification that the student has fulfilled the degree requirements.
5. Encouragement of and advice to the student and review of manuscripts based on the thesis research for publication in scholarly journals.

### **Admissions Requirements and Guidelines**

All requirements of the University, as set forth in this Catalog, must be met prior to admission into the MCCJ program in the Department of Criminal Justice. The admissions criteria for Regular Admission status are:

1. A baccalaureate degree from a regionally accredited 4-year college or university, or the equivalent from a foreign country.
2. A minimum cumulative grade point average (GPA) of 3.0 (on a 4.0 scale) on undergraduate coursework.
3. Successful completion of the Graduate Record Examination (GRE) [General Test]. Acceptance of the scores will be determined by the Admissions Committee.
4. Three letters of recommendation from person capable of adequately assessing the applicant's potential for success in the program.
5. An interview by the Admissions Committee.

### **Provisional Admission**

Applicants who fail to meet any of the above requirements may be admitted on a provisional basis. Provisional admission consideration will be based on fulfillment of all the following:

1. A minimum cumulative GPA of 2.75 (on a 4.0 scale) on all undergraduate coursework.
2. Registration will not be allowed for more than 9 credit hours in the first semester in the program, and a minimum grade of "B" in all courses must be maintained.
3. Three letters of recommendation from persons capable of adequately assessing the applicant's potential for success in the program.
4. Successful completion of the GRE (general test) within the timeframe presented in the Department's Graduate Program Policy and Procedures document.

### **Application Deadlines**

Fall Semester - April 15  
Spring Semester - October 30  
Summer Sessions - April 15

### **Academic Probation, Suspension and Dismissal**

Academic probation follows the policy of the Graduate School as set forth in this Catalog.

The Department's policy on academic suspension for this program is that a student may be suspended from the program if he/she:

1. earns two "C" grades; or
2. has a cumulative GPA of less than 3.0.

Removal of Academic Suspension is as follows. A suspended student may be conditionally readmitted after:

1. sitting out for one calendar year; and
2. retaking the GRE test.

The Department's policy on academic dismissal from this program is that a student shall be dismissed from the program if he/she:

1. makes three grades of "C" or less in one semester, and
2. makes two "C" grades in one semester while in Provisional Admission status.

### **Non-Degree Registration**

A student who has not been formally admitted into the Criminal Justice Graduate program may be allowed to take no more than six (6) credit hours of classes per semester as a non-degree seeking student. Such grades earned will not in any way count toward qualifying conditions for admission into the program. Non-degree seeking students are admitted by the Graduate School and follow the policy for the Advanced Special Status Student set forth in this Catalog.

### **Retention and Exit Requirements**

All students, regardless of area of concentration or program option chosen, must maintain a cumulative 3.0 or better grade point average, complete degree requirements in five (5) years or less, and successfully pass a written comprehensive examination. The written comprehensive examination may be attempted a maximum of two times. Comprehensive examinations are given each October and April. The Department of Criminal Justice's Comprehensive Examination Procedures will govern conduct of the examination.



### **Employed Professionals**

The MCCJ Program acknowledges the correlation between theory and research on the one hand and practical application on the other. The MCCJ Program strongly invites criminal justice practitioners and other professionals to enroll in the program. The overall objective is to prepare practitioners for advanced administrative positions in criminal justice and other related agencies. Students may elect to complete the program requirements for graduation on either a full-time or part-time basis (five-year limit for the duration of the program). The program courses will to the extent possible be offered in the evenings in order to accommodate employed practitioners. Courses may also be offered on weekends.

### **Financial Assistance**

UMES recognizes the high cost of education and makes every effort to offer financial assistance, through a variety of programs, to qualified students. In addition, federal loans are available to graduate students through the university's financial aid office. For additional information about loans and other sources of aid, contact the Financial Aid Office.

### **Faculty of The Department of Criminal Justice**

The Department of Criminal Justice is interdisciplinary with faculty holding advanced degrees in various disciplines, including law, sociology, public administration, and criminology. All resident faculty in the department are expected to teach in both the graduate and undergraduate programs. All faculty members, except adjunct lecturers, provide student counseling and serve as advisors to students in the department.

### **Description of Courses**

*(NOTE: Credit Hours are given in parentheses)*

#### Core Courses

*(All students in the program are required to take these courses.)*

#### *MCCJ 600 Proseminar in Criminology and Criminal Justice (3)*

This course is designed as an in-depth analysis of criminological issues and components of the criminal justice system for students with diverse undergraduate backgrounds. It employs an integrated systems approach toward thinking about crime and its causes and covers the history of criminological thought as well as multidisciplinary attempts at crime explanation.

#### *MCCJ 620 Theoretical Perspectives on Crime and Justice (3)*

This course is a survey of criminological theories with emphasis on crime causation and justice. Included are sociological, economic, geographic, and political theories of law formation and law breaking; development of physiological, genetic, psychological, and psychiatric perspectives of criminal behavior and the relationship between theory and policy.

#### *MCCJ 625 Research Methods in Criminology and Criminal Justice (3)*

This course provides an introduction to the research methodology used in studying crime and criminological issues.

#### *MCCJ 631 Applied Statistics in Criminology and Criminal Justice (3)*

This is an advanced applied social statistics course with computer applications, using examples from criminological issues and crime-related data. Statistical procedures to be studied – descriptive and inferential statistics and linear regression techniques—are those typically used to analyze data to understand and explain criminological issues.

Prerequisite: Undergraduate or graduate introduction to statistics

*MCCJ 640 Minorities, Crime, and Justice (3)*

This course considers the relationships among race, ethnicity, and crime in the justice system. The effect of social policy on racial and ethnic inequality is studied, and theories of ethnic and racial justice are presented in terms of their effect on crime and criminal justice.

Supportive Courses

*(NOTE: Courses for different areas of concentrations are designated as follows:*

*CR=Criminology and Research; LEC=Law Enforcement and Courts; and CDP=Corrections and Delinquency Prevention)*

*MCCJ 642 Women, Crime, and Justice (3) CR*

This course explains theories of gender, society, and their relationship to crime are explored. Empirical knowledge of causal theories will be used to explore reasons for female involvement in the criminal justice system. An exploration of the meaning and application of justice for women will also be included.

*MCCJ 644 Organized Crime (3) CR; LEC*

This course provides the student with both an historical and contemporary analysis of organized crime and the fight against organized crime in the United States; considers factors that led to the rise of organized crime in the United States at the turn of the 20th Century and how those factors continue to influence organized crime today. It also considers multiple theories of organized crime and explores many of the methods used by law enforcement to curtail/eliminate organized crime.

*MCCJ 646 Special Topics in Criminology and Criminal Justice (3) CR; LEC; CDP*

This course analyzes current research and policy issues of priority from a range of perspectives in criminology and criminal justice (focus of course is on specific research expertise of faculty and importance of justice issues).

*MCCJ 648 Criminal Justice Administration (3) CR; LEC; CDP*

This course acquaints students with a basic understanding of organization/administrative theory and behavior and their assumptions. The course will explore administrative theories within a criminal justice context as students learn the impact of organization structure, environment, and behavior on such issues as leadership, control, and decision making.

*MCCJ 650 Private and Industrial Security (3) CR; LEC; CDP*

This course deals with historical, philosophical, and modern perspectives of private and industrial security - survey of its principles, its legal authority and its effects on society in general. Included in the course are institutional security, challenges of violence in the workforce, industrial and retail security, various forms of preventing losses, and risk management.

*MCCJ 652 Survey of the Correctional Field (3) CDP*

This course examines the dynamics of American correctional techniques and rationale from the 1700's to date. It familiarizes students with the history, philosophy, and evolution of correctional practice in America.

*MCCJ 654 History of African American Criminological Thought (3) CR; LEC; CDP*

This course is designed to provide the student with knowledge of and understanding of African American perspectives on criminology and criminal issues. The course is intended to give graduate students perspectives that are often omitted from mainstream undergraduate criminal justice curriculums. The materials used in this course are relatively broad covering

both historical and contemporary African American thought. The perspectives considered have analyzed the issues with an emphasis on how they impact and are impacted by race.

*MCCJ 656 Law Enforcement (3) LEC; CDP*

This course analyzes the problems, practices, and philosophies of law enforcement in contemporary society. It gives special attention to particular areas, such as personnel selection, police-community relations, crisis intervention, patrol intervention, police brutality, and criminal profiling.

*MCCJ 658 Law and Courts (3) LEC; CDP*

This course considers the definitions and development of criminal law, criminal procedure, criminal rights, and constitutional theory and practice. It also examines the structure, functions, and operations of the courts, with special emphasis on principles of legality as provided by the US constitution.

*MCCJ 659 Theories of Juvenile Delinquency (3) CR; LEC; CDP*

This course examines theories of juvenile delinquency, environmental influences on juvenile offenders, control, and corrections of the juvenile offender. It will investigate the special forms of justice applied to non-adults by arrest, detention, adjudication and juvenile corrections.

*MCCJ 700 Public Policy in Criminal Justice System (3) CR; LEC; CDP*

This course examines the assumptions, context, and environment for the formulation and implementation of public policy. The issues of morality and politics will provide a subtext for discussion and analysis of contemporary public policy. There will also be a discussion and identification of stakeholders.

*MCCJ 710 Law and Social Control (3) CR; LEC; CDP*

Select topics in Law and Social Control are examined in this course. Topics -- which may vary from semester to semester--include mental illness and the law, individual rights and public welfare, comparative criminal law and procedure, sanction law and public order, authority and power, and indirect social control in criminal justice.

*MCCJ 720 Seminar in Community Policing (3) LEC*

This course focuses on the problems and practices of contemporary law enforcement and uses current scholarship to understand police-community relations.

*MCCJ 730 Seminar in Terrorism (3)*

This course is a review of historical and contemporary knowledge on the many terrorism crime relationships. It includes a survey of the literature that examines patterns of terrorism, domestic, global, and technological terrorism and a review of articles that examine theories, causes, ideology, typologies, security problems, media, structure, and issues in counterterrorism.

*MCCJ 734 Directed Individual Study (1-6) CR; LEC; CDP*

This course involves chosen individual study under the supervision and guidance of a faculty member. This course may be repeated for a maximum of six (6) credits.

*MCCJ 740 Comparative Criminology and Criminal Justice (3) CR; LEC; CDP*

This course examines criminal justice institutions comparatively in several countries. The purpose will be to describe the variety of criminal justice experience, to understand the

determinants of these variations, and enhance the understanding of what works, what doesn't, and why in the criminal justice system.

*MCCJ 750 Seminar in Probation and Parole (3) CDP*

This course is an in-depth examination of selected area within the broader field of corrections. Specific attention will be paid to analysis of theories and practice of probation and parole, responses of paroling authorities to public pressures, and court controls and their implications for rehabilitative efforts. It assesses the feasibility and effectiveness of treatment of individuals under sentence in the community.

*MCCJ 760 Qualitative Methods in Criminology (3) CR; LEC; CDP*

This course is an examination of ethnographic and qualitative fields methods and their application to problems of crime and criminal justice. It is focused on familiarizing students with the nature and utility of qualitative fieldwork in various areas of criminological research.

*MCCJ 770 White Collar and Governmental Crimes (3) CR; LEC; CDP*

Special topics in White Collar and Governmental Crimes are examined in this course from a criminological perspective. White collar crimes and government crimes include fraud, embezzlement, price-fixing, antitrust violations, income - tax evasion, misuse of public funds, and abuse of political and legal powers.

*MCCJ 780 Seminar in Criminological Theory and Research (3) CR*

This course is an exploration of the etiology of crime, theory development and crime causation. Emphasis will be placed on theoretical perspectives, research, and ideological dialectics. Bio-criminology, employing an integrated systems approach, will also be examined.

*MCCJ 782 Advanced Seminar in Police and Society (3) CR; CDP*

This course is a survey of literature examining historical and current issues and problems in policing with emphasis on the legal aspects of law enforcement.

*MCCJ 786 Field Practice in Criminal Justice (1-3) CR; LEC; CDP*

This course involves firsthand experience in the day-to-day operation of a criminal justice program under the guidance and supervision of a faculty member and a practitioner in the field.

*MCCJ 790 Master's Comprehensive Examination (0) (s/u grade only)*

This course is required of all students involved in the Master of Science program with the consent of the major professor. Students must be registered for at least one class when taking the comprehensive examination.

*MCCJ 799 Master's Thesis (1-6) CR; LEC; CDP*

This course is required of all students involved in preparation, data collection, and writing of the Master of Science (MS) thesis.

**For further information on this program, please contact**

**Robert Harleston, Ph.D.**

Graduate Program Coordinator (MCCJ)

Hazel Hall

Department of Criminal Justice

University of Maryland Eastern Shore

Princess Anne, MD 21853

Email: [raharleston@umes.edu](mailto:raharleston@umes.edu)

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## Department of Education

### **Degrees Offered**

Master of Arts in Teaching (M.A.T)

Master of Education (M.Ed.), Counselor Education

Master of Education (M.Ed.), Special Education

Education Leadership (Ed.D.), Education Leadership

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### **M.A.T., Master of Arts In Teaching**

UMES/Salisbury University: Collaborative Degree-Granting Program

#### **Objective of the Program**

The MAT is a 39 semester-hour professional degree program designed to prepare students for initial teacher certification. It is an alternative, collaborative degree program offered by Salisbury University (SU) and the University of Maryland Eastern Shore (UMES).

The MAT is intended for students who have earned a non-teaching baccalaureate degree from an accredited institution of higher education in an appropriate content area, who now wish to become teachers in a secondary school (grades 7-12). Students may prepare for teacher certification in the following State-approved programs at UMES: Agriculture, Art, Biology, Business, Chemistry, English, Family & Consumer Sciences, Mathematics, Music (vocal and instrumental); Social Studies and Technology.

The overall goal of the MAT program is to prepare students to become effective educators and to meet the certification and professional standards of the Maryland State Department of Education. To accomplish this goal, there are four major objectives:

1. To allow students to build upon the content knowledge they have acquired in the baccalaureate degree, adding the professional knowledge necessary for a career in teaching.
2. To prepare teachers who are well-grounded in research, theory, and practice related to effective classroom instruction and school improvements.
3. To enable teacher candidates to develop and demonstrate sensitivity and effective interpersonal skills in working with culturally diverse populations.
4. To nurture educators who are committed, continuous learners, and contributors to the enhancement of the teaching profession.

#### **Accreditation**

UMES' Teacher Education and School Counseling Programs are accredited by the National Council for Accreditation of Teacher Education (NCATE) and approved by the Maryland State Department of Education (MSDE).

#### **Admission Requirements**

##### **Regular Admission**

Although students must matriculate at the campus where there is a State-approved teacher preparation program in their intended field, applicants will be admitted to the MAT program by a common UMES/SU admission process. To be admitted to the program all applicants must:

1. Possess a baccalaureate degree in a content area.
2. Meet the requirements for regular admission to the graduate school.
3. Take and pass Praxis I.
4. Possess an undergraduate grade-point average of a least 3.0 in the last half of the undergraduate program, or possess a prior graduate degree from an accredited institution.
5. Submit official transcripts from all higher institutions attended.
6. Submit three letters of recommendation that address: their personal qualities, e.g., character and academic abilities; problem solving skills, conceptual thinking, and writing and speaking skills needed to support a rigorous graduate program; and that they possess the personal determination and commitment needed to complete this program.
7. Participate in the individual structured interview session by the SU/UMES Admissions Committee.
8. Complete the MAT Application Form, including a personal statement of purpose.

The transcripts and academic credentials of all applicants will be reviewed by the UMES/SU joint MAT Admissions Committee. Appropriate academic departmental subcommittees will determine whether students possess adequate and current content coursework in the intended certification area. Individuals who lack appropriate course work will be expected to complete the identified course requirements prior to their enrollment in the internship portion of the MAT program. Students holding degrees which are more than five years old, may be required to take additional courses in the major area before taking method courses, or before the internship. No additional courses will be taken during the full-time internship. Students must follow the school day and holiday schedule of the school system in which their internship occurs.

### **Provisional Admission**

Applicants who possess an overall undergraduate GPA of 2.75 may be considered for admission to the MAT program under Provisional Status. They must maintain a 3.0 or better GPA in the first nine credit hours. A transcript review will be conducted after the first nine credit hours. Students meeting the 3.0 standard will be granted regular admission status if other provisional conditions have also been met. Those who do not meet the standard will be terminated from the program.

### **Retention and Exit Requirements**

The specific requirements for the MAT degree are as follows:

#### **1. Course Work**

A minimum of 39 semester hours of course work will be required for the MAT degree. All requirements must be completed within a five-year period after admission to the program.

## 2. Retention

To remain in good standing in the MAT program each UMES student must meet and maintain the following performance criteria:

- a) Earn an overall grade point average of 3.0 or higher.
- b) Earn no more than six credit hours of C or C+ grades and no grade lower than a C.
- c) Take and pass PRAXIS II prior to beginning the student internship experience.
- d) Complete a seminar paper before the internship that meets the identified standards.
- e) Complete the program within three calendar years of advancement to candidacy.

### **Advisement System**

Students in the MAT program have an on campus advisor throughout their course of study, who is available to serve as mentor and to advise them on academic and career plans. Students may not register for classes without discussing their program with their academic advisor and receive the advisor's signature on the registration and drop/add forms.

### **Application Deadline**

All fully completed applications must be submitted to the Graduate School no later than October 1 for Winter Session admission.

### **Transfer Credits**

A maximum of six graduate credits may be accepted for transfer into the program, provided these credits are as specified (see transfer credits section of this Catalog).

### **Comprehensive Portfolio Examination**

Students in the UMES/SU MAT program must obtain passing scores on the portfolios they assemble as a capstone to the program. This portfolio is created under the direction of the EMAT 511 Seminar professor and presented at the culmination of the Seminar. It shows how the candidate has met all of the INTASC standards.

### **Seminar Paper**

All UMES students must write a seminar paper that demonstrates their ability to analyze and synthesize educational research. The student's advisor should be consulted on the process. Seminar papers must be completed and approved by designated UMES personnel.

### **Internship**

Completion of an internship as a full-time teacher in a Professional Development School internship is required for completion of the degree.

### **MAT Program Curriculum**

The Master of Arts in Teaching is a 16-month, initial teacher certification program offered collaboratively by the University of Maryland Eastern Shore and Salisbury University. Successful completion of the program and passing PRAXIS I and II results in a Master's degree as well as eligibility for the secondary teaching certificate (grades 7-12 or, for music and art, grades preK-12) in the state of Maryland. All courses are 3 credits for a total of 39 credit hours.

### *Winter Term*

EMAT 501 Development & Learning Applied to Teaching (SU)

### *Spring Term*

EMAT 502 Foundations of Education in a Diverse and Democratic Society (SU)  
EMAT 504 Reading in the Content Area I (UMES students only) (UMES)  
EMAT 539 Instruction and Assessment for Student Learning (UMES)  
EMAT 538 Technology in Education (SU)

### *Summer I Term*

EMAT 537 Educational Research (UMES)

### *Fall Semester*

EMAT 506 The Inclusive Classroom (UMES)  
EMAT 508 Reading in the Content Area II (UMES students only) (UMES)  
EMAT 512 Classroom Management: Theory and Practice (SU)  
EMAT 5xx Methods (UMES students only) Examples:  
    Art: EMAT 530  
    Business: EMAT 527B, etc. (UMES)

*Must have taken and passed Praxis II before beginning student internship.*

### *Spring Semester*

EMAT 507 Internship I  
EMAT 509 Internship II  
EMAT 511 Internship Seminar  
Presentation of Portfolios = the Portfolio Comprehensive Exam

### **Additional Program Requirements**

1. All courses taken at SU require an inter-institutional form for registration.
2. Most courses require field experiences. At least the equivalent of one day per week should be set aside to meet this requirement.
3. Students in this program must complete 100 days internship in a Professional Development School. While it may be no less than 100 days, the internship does not end when 100 days have been accumulated.

Courses are taught on both campuses. In any semester, half of the courses are taught at UMES and the others at SU.

*Note: The Teacher Educator in the academic department that offers the program in which the student plans to teach must review his/her transcripts and indicate what content course work, if any, must be completed prior to the internship.*

### **Course Descriptions**

*(Note: Credit hours are given in parentheses)*

#### *EMAT 501 Development and Learning Applied to Teaching (3)*

The course examines theory and research in human development and learning psychology with application to teaching in contemporary middle and secondary schools. Emphasis is



placed on translating theory into practice by integrating field experiences, class work, student projects, assignments, and exams.

Prerequisite: Admission to the MAT program or consent of the instructor.

*EMAT 502 Foundations of Education in a Diverse and Democratic Society (3)*

This course is a comprehensive overview of the foundation of education in a diverse and democratic society. It is an interdisciplinary attempt incorporating the social, philosophical, economic, political, historical and curricular foundations to provide teacher candidates with a clear understanding of the teaching profession. A special attention will be given to cultural problems and issues that influence opportunities, and performance in educational institutions, including controversies confronting American education today. Twenty hours of field experiences in an educational setting required. Prerequisite: Admission to the MAT program.

*EMAT 504 and 508 Reading in the Content Areas I and II (3 each)*

The courses are an analysis of reading/writing/learning processes with an emphasis on skills and strategies to facilitate student comprehension and learning of content in middle and secondary schools. The course examines research and practice; field experiences are required. Prerequisite: Admission to the MAT program.

*EMAT 506 The Inclusive Classroom (3)*

This course is designed to provide students with the fundamentals of inclusive teaching. The focus of the course will be to teach students the history of special education, legal and ethical foundations for individuals with disabilities, accommodations, modifications of students with high, low, multiple incidence disabilities, effective teaching/management skills, and an overview of specific strategies that promote learning within the content areas. Students will identify specific problems in content areas and learn how to effectively address them. Students will also learn how to create assessments that provide immediate feedback in a variety of formats. Field experiences are required. Prerequisite: Admission to the MAT program.

*EMAT 5xx Secondary School Methods (500 level course number will vary according to the content major.) (3)*

The course prepares prospective teachers to teach content area in middle and high schools. Students will integrate content knowledge with basic teaching methodologies of preparing objectives, effective questioning, curriculum and resource evaluations, teacher presentations, cooperative learning, demonstrations and experiments, student projects, classroom management, lesson and unit planning. Students will be placed with a high school or middle school teacher for observations and bit teaching experiences. Prerequisites: Successful completion of EMAT 502 and EMAT 512 courses. (This is a sample of the course to be offered. A specialized content area methods course will be offered in each area for which one or both institutions [UMES, SU] have a State-approved program.)

*EMAT 507, 509 Internship I and II*

*EMAT 511 Seminar(9)*

Full-time fourteen weeks clinical internship and concurrent campus seminar provide the intern with opportunities to actualize the latest educational research and theory into practice. These opportunities include and are not exclusive to: observation, mini-teaching, macro-teaching, whole group lessons and action research. The seminar provides a forum for discussing problems encountered during the internship, and also provides a colloquium for developing strategies to resolve these problems. The internship will be conducted under the

direct supervision of a clinical supervisor (experienced public school teacher) with guidance and support from the University supervisor. Prerequisites: Completion of all coursework in the MAT sequence prior to the Internship, including content methods, and achievement of a passing score on PRAXIS II.

*EMAT 512 Classroom Management (3)*

The course provides the student with a repertoire of strategies to create a classroom environment that facilitates optimal learning. Different classroom management theories will be explored and evaluated for appropriateness in a given situation. Special attention is given to accommodating diversity, and strategies for effectively communicating with families are considered. Prerequisites: Admission to MAT program, completion of the professional education sequence, and content requirements.

*EMAT 537 Educational Research (3)*

Introduction to quantitative and qualitative methods of inquiry as they apply to the needs of teacher-researchers. Attention to reading, analyzing, and interpreting scholarly research to solve instructional problems. Students will design an action research project that addresses an area of current concern in the field of P-12 education. Prerequisite: Admission to MAT program

*EMAT 538 Technology in Education (3)*

This course examines educational technology and its current and potential impact on schools. The course provides an introduction to the role of technology in the teaching and learning process as well as how the use of technology can enhance teacher productivity and professional development. It examines current issues in the use of educational technology, the impact of technology on society, and techniques for integrating technology into the classroom. Students examine Web 2.0, audio, video, and graphic technologies, as well as tools for collecting and analyzing student data. Prerequisite: Admission to MAT program

*EMAT 539 Instruction and Assessment for Student Learning (3)*

This graduate course will focus on the appropriate selection, construction, administration and use of effective educational assessment tools particularly as they impact student learning. Using the curriculum-instruction-assessment cycle, MAT teacher candidates will explore of these important connections to better understand their roles and responsibilities as classroom teachers in the assessment process. Prerequisite: Admission to MAT program

**For more information on this program, please contact:**

Graduate Program Coordinator  
Master of Arts in Teaching Program  
Department of Education, Hazel Hall  
University of Maryland Eastern Shore  
Princess Anne, MD 21853

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## M.Ed., Counselor Education

### **Objective of the Program**

The Counselor Education program offers graduate work leading to a Master of Education (M.Ed.) degree. The school counseling program is approved by the Maryland State Department of Education to meet competency area requirements for school certification (K-12). The program prepares students to become entry-level, human development specialists. The M.Ed. level program constitutes the initial professional preparation for students desiring employment in public or private schools or non-educational agencies. The course of study is based on the Council for the Accreditation of Counseling and Related Educational Programs (CACREP) national standards.

The general objectives of the program are:

1. To help students develop personal and interpersonal qualities and skills that are necessary to function in helping others.
2. To provide students with the competencies needed to demonstrate knowledge and skills that are necessary for counselors in school settings and human development specialists in non-school settings.

### **Accreditation**

UMES' Teacher Education and School Counseling Programs are accredited by the National Council for Accreditation of Teacher Education (NCATE) and approved by the Maryland State Department of Education (MSDE).

### **Admission Criteria**

The Counselor Education Program Admissions Committee recommends students to the UMES Graduate School for admission to the program. Entrance requirements include:

1. Bachelor's degree from an accredited institution.
2. Course preparation in education, psychology and human development. Students are expected to have completed the following undergraduate courses prior to entry into the program: Human Growth and Development; Tests and Measurements; Introduction to Special Education; and Introduction to Psychology.
3. 3.0 average or better on a 4.0 scale in undergraduate course work.
4. Three letters of recommendation from persons capable of assessing the applicant's potential for success in a Counselor Education graduate program.
5. An interview with the Admissions Committee.

### **Application Deadlines**

Fall Semester	- May 1st
Spring Semester	- November 1 <sup>st</sup>
Summer	- April 1st

### **Provisional Admission**

Applicants who possess an overall GPA of 2.75 will be admitted to Provisional Status. Provisional Status students must maintain a 3.30 average in the first nine approved credit hours of graduate level courses in Guidance and Counseling.

A student who is considered to have potential for success, but lacks adequate course preparation for Guidance and Counseling, may be asked to complete additional courses to enhance their background in related fields.

### **Exit Requirements**

1. A 100 clock hour pre-internship and a 400 clock hour Internship are required for all students. The Internship and internship are supervised counseling experiences in which students are required to integrate and apply the knowledge and skills acquired throughout the program. Students seeking certification as a school counselor are placed in school settings at the elementary/middle and high school levels where they can participate in all activities that a professional school counselor is expected to perform. Other students are placed in appropriate agencies where they can participate in all activities expected by a community counselor. Application to take the Internship must be filed with the department one semester before the student plans to take it. Approvals of advisor and the program coordinator are required.
2. A written comprehensive examination is required to ensure the mastery of the program competencies. Core courses must be completed before the comprehensive examination is taken.
3. The completion of a seminar paper demonstrating research competency is required. The advisor for the paper, the Graduate Program Coordinator, and the Chair of the Education Department must approve this paper.
4. The M.Ed. degree student must maintain a 3.0 grade point average. No grade in any program course which is lower than a "C" is acceptable for retention in the program.
5. A minimum of 48 credit hours is required for completion of the Master's degree program in Counselor Education.

### **Counselor Education Courses**

*(NOTE: Credit Hours are given in parentheses)*

Based upon the applicant's background and interests, a course of study will be planned with the advisor that is congruent with the student's career goals. Curriculum options are: (1) School Counseling K-12; or (2) Community Counseling.

#### Counselor Education School Program (K-12)

##### *Core Course/Competency Requirements*

- CNED 601 Introduction to Guidance & Counseling (3)
- CNED 604 Theories and Techniques of Counseling (3)
- CNED 605 Individual and Group Appraisal (3)
- CNED 606 Clinical Applications of Counseling (3)
- EDUC 620 Human Growth and Development (3)
- CNED 631 Career and Life Development (3)
- CNED 640 Group Processes in Counseling (3)

CNED 643 Counseling Children and Adolescents (3)  
CNED 645 Cross Cultural Perspectives in Counseling (3)  
CNED 646 Organization and Administration of Guidance Programs  
CNED 660 Crisis Management in Counseling (3)  
CNED 670 Ethical, Legal & Professional Issues in Counseling (3)  
CNED 677 Advanced Internship in School Counseling (3)  
EDUC 690 Introduction to Behavioral Research (3)  
CNED 697 Advanced Internship in School Counseling (3)  
CNED 698 Seminar in Counseling (3)

### Community Counseling

#### *Core Course/Competency Requirements*

CNED 602 Introduction to Community Counseling (3)  
CNED 604 Theories and Techniques of Counseling (3)  
CNED 606 Clinical Applications in Counseling (3)  
CNED 612 Marriage and Family Counseling (3)  
EDUC 620 Human Growth and Development (3)  
CNED 631 Career and Life Development (3)  
CNED 640 Group Processes in Counseling (3)  
CNED 645 Cross Cultural Perspectives in Counseling (3)  
CNED 655 Social Diversity in Counseling (3)  
CNED 660 Crisis Management in Counseling (3)  
CNED 670 Ethical, Legal, & Professional Issues in Counseling (3)  
CNED 679 Internship in Community Counseling (3)  
EDUC 690 Introduction to Behavioral Research (3)  
CNED 698 Seminar in Counseling (3)  
CNED 699 Advanced Internship in Community Counseling (3)  
Elective (3)

### Elective Courses

The student may select additional electives to complete degree requirements from the following offerings upon approval by the Advisor.

CNED 655 Social Diversity in Counseling (3)  
CNED 612 Marriage and Family Counseling (3)  
CNED 665 Special Topics (1 credit each-maximum 6 credits)  
examples:  
DSM Diagnosis  
Substance Abuse Counseling  
Treating Emotional Disturbances  
CNED 610 Introduction to Advanced Psychology (3)  
CNED 609 Special Problems in Guidance & Counseling (1-3)  
CNED 646 Organization and Administration of Guidance Program (3)  
CNED 798 Research Project (1-3)

### **Sample Sequence of Courses for Counselor Education School Program (K-12)**

#### 1st Year

#### *Fall*

CNED 601 Introduction to Guidance & Counseling

CNED 604 Theories and Techniques of Counseling  
EDUC 620 Human Growth and Development

*Spring*

EDUC 690 Introduction to Behavioral Research  
CNED 640 Group Processes in Counseling  
CNED 631 Career and Life Development

2nd Year

*Fall*

CNED 645 Cross-Cultural Perspectives in Counseling  
CNED 643 Counseling Children and Adolescents  
CNED 605 Individual and Group Appraisal

*Spring delete*

CNED 670 Ethical, Legal, and Professional Issues in Counseling  
CNED 660 Crisis Management in Counseling  
CNED 646 Organization and Administration of Guidance Programs

3rd Year

*Fall*

CNED 606 Clinical Applications of Counseling  
CNED 677 Advanced Internship in School Counseling  
CNED 698 Seminar in Counseling

*Spring*

CNED 697 Advanced Internship in School Counseling

**Sample Sequence of Courses for Community Counseling**

1st Year

*Fall*

CNED 602 Introduction to Community Counseling  
CNED 604 Theories and Techniques of Counseling  
EDUC 620 Human Growth and Development

*Spring*

EDUC 690 Introduction to Behavioral Research  
CNED 640 Group Processes in Counseling  
CNED 631 Career and Life Development

2nd Year

*Fall*

CNED 645 Cross-Cultural Perspectives in Counseling  
CNED 612 Marriage and Family Counseling  
CNED 665 Special Topics Substance Abuse Counseling (Elective)

*Spring*

CNED 670 Ethical, Legal, and Professional Issues in Counseling  
CNED 660 Crisis Management in Counseling  
CNED 655 Social Diversity in Counseling

### 3rd Year

#### *Fall*

CNED 606 Clinical Applications of Counseling  
CNED 679 Internship in Community Counseling  
CNED 698 Seminar in Guidance and Counseling

#### *Spring*

CNED 699 Advanced Internship in Community Counseling

### Courses

(NOTE: Credit Hours are given in parentheses)

#### *CNED 643 Counseling Children and Adolescents (3)*

This course examines counseling theory and techniques as related to children and adolescents. It emphasizes how to plan and implement counseling strategies appropriate to the developmental stages and need of each group.

#### *CNED 631 Career and Life Development (3)*

This course is the study of topics on: career development theories, the relationship between career choice and life style, sources of occupational and personal/social information, career decision-making processes and career development explanation techniques.

#### *CNED 610 Introduction to Advanced Psychology (3)*

This is a survey course which reviews major psychological concepts of human development and behavior. The intent of this course is to provide a foundation to students with a minimal background in psychology and the social sciences who intend to enter the field of counseling. Emphasis is given to personality theory, abnormal psychology, and adjustment.

#### *CNED 601 Introduction to Guidance & Counseling (3)*

This course is an overview of the field of guidance and counseling, providing knowledge of the historical and philosophical foundations of guidance and counseling and their implications for professional practice. Professional activities and ethical practices of counselors and other helping professionals in both educational and non-educational settings are explored. Exploration of how personal values interact and impact upon counseling are examined.

#### *CNED 602 Introduction to Community Counseling (3)*

This course focuses on planning, implementation, administration, and evaluation of human service systems affecting communication. Major organization theories, management styles, administrative techniques and study of relevant issues in human services delivery in a community setting are explored.

#### *CNED 604 Theories & Techniques of Counseling (3)*

The course focuses on counseling theories and techniques, with emphasis on their applicability to specific counseling settings and counselor orientation.

#### *CNED 605 Individual and Group Appraisal (3)*

The course focuses on the following topics: understanding of group and individual educational and psychometric approaches to appraisal, use and interpretation of both standardized and non-standardized appraisal data, and planning and administering testing programs.

*CNED 606 Clinical Applications of Counseling (3)*

Students conduct the initial stages of counseling with individuals, who present a variety of personal, educational, and vocational concerns. Students will establish realistic goals with the client and evaluate the extent to which goals were reached. Students will describe their own well formulated theory of counseling.

*CNED 609 Special Problems in Guidance and Counseling (1-3)*

This course consists of individual projects geared to specific needs of students. It allows students to study independently in topical areas related to counseling. Specific requirements related to each independent study are approved on an individual basis. PREREQUISITE: Written permission of adviser is required.

*CNED 612 Marriage & Family Counseling (3)*

This course focuses on counseling theory and techniques as related to families and couples, with an emphasis on the unique aspects of marriage and family relationships. Analysis of family dynamics and the use and interpretation of genograms are presented.

*CNED 640 Group Processes in Counseling (3)*

The study of the dynamic processes that occur in groups and their application to group counseling is the focus of this course. It examines group stages, leadership styles and the importance of verbal and non-verbal communication in a laboratory setting. Social and cultural issues such as race, gender and social class are also addressed. Actual involvement in group process is required.

*CNED 645 Cross-Cultural Perspectives in Counseling (3)*

This course examines barriers in effective cross-cultural counseling. There is an emphasis on understanding cultural characteristics on visible racial/ethnic groups. Issues of racial identity world view and bias awareness are addressed.

*CNED 646 Organization and Administration of Guidance Program (3)*

This course examines the evolution of content-based comprehensive guidance programs and why guidance programs are an integral part of the school curriculum. It provides the student with experience in developing and implementing a comprehensive program.

*CNED 655 Social Diversity in Counseling (3)*

This course is study of the nature, characteristics, and needs of socially diverse client groups seeking counseling. Socially diverse groups will include those with differing life-styles, physical disabilities, learning disabilities, the gifted and talented, the elderly, the obese and women. An emphasis will be placed on societal oppression, treatment, discrimination, and specific counseling issues related to these socially diverse groups.

*CNED 660 Crisis Management in Counseling (3)*

This is an overview of applied therapeutic counseling in general and crisis intervention in particular. There is an emphasis on intervention strategies that work when people are in crisis. Counseling and counselor issues that will be effective in any crisis are explored. Topics such as suicide, sexual assault, posttraumatic stress disorder, and bereavement and grief are addressed.



*CNED 665 Special Topics (1)*

This course number and title are intended to be a mechanism for students to take 1 credit courses on special topics that are cutting edge in the field of counseling and/or completion of program skills and requirements.

*CNED 670 Ethical, Legal and Professional Issues in Counseling (3)*

The study of the role of the counselor in relation to ethical and legal issues and dilemmas is explored. Emphasis is placed on the dynamic interactions and processes between counselor, individuals, and institutions. Topics such as standards, licensure, accountability, liability, and professional development will be addressed.

*CNED 677 Advanced Internship in School Counseling (3)*

This course assists counselor trainees in acquiring a broad and varied background of knowledge, skills and abilities, as well as certain personal characteristics, in order to perform their roles effectively and efficiently. The trainee must demonstrate under supervision the ability to integrate and apply theories and techniques in providing direct counseling services for individuals and groups and to participate in appropriate professional activities in the Internship setting.

*CNED 679 Internship in Community Counseling (3)*

This course assist community counselor trainees in acquiring a broad and varied background of knowledge, skills and abilities, as well as certain personal characteristics, in order to perform their roles effectively and efficiently.

*CNED 697 Advanced Internship in School Counseling (3)*

This course is an advanced group supervision experience (taken in conjunction with the second Internship placement) which seeks to provide a capstone experience that prepares students for a career as a professional counselor.

*CNED 698 Seminar in Counseling (3)*

The opportunity to research professional issues is provided, culminating in an approved seminar paper.

*EDUC 620 Human Growth & Development (3)*

This course is a general overview of life-span development from conception through late adulthood. The scientific study of the quantitative and qualitative ways people change over time is examined. The use of theory and other information through application of scientific principles in the study of a child may be included.

*EDUC 690 Introduction to Behavioral Research (3)*

This course introduces the various methods and techniques of educational research. It provides intensive experience both in reading, analyzing and interpreting educational research and in writing abstracts, reports on research and seminar papers.

*CNED 699 Advanced Internship in Community Counseling (3)*

This course is an advanced group supervision experience (taken in conjunction with the second part of Internship placement) which seeks to provide a capstone experience that prepares students for a career as a professional counselor.

Special Topics courses are classes that meet licensure requirements.

**For more information on this program, please contact:**

Cheryl Bowers, Ph.D.

Graduate Program Coordinator,

Counselor Education

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## M.Ed., Special Education

### **Objective of the Program**

The Department of Education provides a Master of Education (M.Ed.) program in Special Education with emphasis on students with mild and moderate disabilities in grades 1-12. The Special Education Program is a Maryland state-approved program at both the undergraduate and graduate levels. The graduate program is designed to develop and refine the graduate student skills as classroom teachers, inclusion teachers, resource teachers, teacher consultants, academic coaches, or as specialists in alternative educational settings. Students must complete the M.Ed. degree with certification if not already certified in special education. They may opt for coursework leading to certification in grades 1-8, 6-12, or both. The course of study varies with the experience and qualifications that individual students bring to the program.

Students may not enroll in the program for certification only.

### **Accreditation**

UMES' Teacher Education and School Counseling Programs are accredited by the National Council for Accreditation of Teacher Education (NCATE) and approved by the Maryland State Department of Education (MSDE).

### **Program Goals**

The overall goal of the Special Education Program is to prepare students to become effective special educators for mild and moderately disabled students in grades 1-12 and to meet the certification and professional standards of the Maryland State Department of Education, the Council for Exceptional Children, and the principles of the Interstate New Teachers Assessment Support Consortium (INTASC). To accomplish this goal, there are four major objectives:

1. To help each student develop and refine the personal and interpersonal qualities and skills necessary to function intellectually, emotionally, and socially with others in the capacity of teacher or facilitator.
2. To prepare teachers and leaders who are knowledgeable of research, theory and practice related to effective classroom and program management.
3. To develop teachers and leaders who are committed, continuous learners, and contributors to the enhancement of the teaching profession.
4. To prepare teachers and leaders who demonstrate sensitivity and effective interpersonal skills in working with culturally diverse populations.

### **Candidate Competencies**

Candidate competencies and outcomes are consistent with those of the Council for Exceptional Children (CEC), the major professional organization representing special educators, the Interstate New Teachers Assessment and Support Consortium (INTASC), and those of the Maryland State Department of Education (MSDE). The following competencies are related to the ten CE standards:

## 1. Foundations

- Understand principles and theories, relevant laws and policies; diverse and historical points of view, and human issues that have influenced and continue to influence the field of special education.
- Understand how issues influence professional practice.
- Understand the impact of issues of human diversity.
- Understand the relationships of organizations of special education.

## 2. Development and Characteristics of Learner

- Demonstrate respect for students.
- Understand the similarities and differences in human development.
- Understand how exceptional conditions can interact with the domains of human development.
- Use knowledge to respond to the varying abilities and behaviors of individuals with exceptional learning needs (ELN).

## 3. Individual Learning Differences

- Understand the effects that an exceptional learning condition can have on an individual's learning.
- Are active and resourceful in seeking to understand how primary language, culture, and familial backgrounds interact with the individual's exceptional condition.
- Provide individualized instruction for individuals with ELN.

## 4. Instructional Strategies

- Possess a repertoire of evidence-based instructional strategies to individualize instruction.
- Promote positive learning results in general and special education curricula.
- Appropriately modify learning environments for individuals with ELN.
- Enhance the learning of critical thinking, problem-solving, and performance skills.
- Emphasize the development, maintenance and generalization of knowledge and skills across environments, settings and the lifespan.

## 5. Learning Environments and Social Interactions

- Create learning environments and active engagement for individuals with ELN that foster cultural understanding, safety and emotional well-being and positive social interactions.
- Foster environments in which diversity is valued.
- Shape environments to encourage independence, self-motivation, self-direction, personal empowerment, and self-advocacy of individuals with ELN.
- Help general education colleagues integrate individuals with ELN in regular environments.
- Use direct motivational and instructional interventions.
- Intervene with individuals with ELN in crisis.
- Provide guidance and direction to para-educators and others.

## 6. Language

- Understand typical and atypical language development.
- Enhance language development and teach communication skills to individuals with ELN.
- Are familiar with augmentative, alternative, and assistive technologies.
- Provide effective language models.
- Facilitate understanding of subject matter for individuals with ELN whose primary language is not English.

## 7. Instructional Planning

- Develop long-range individualized instructional plans.
- Translate individualized plans into shorter-range goals and objectives.
- Emphasize explicit modeling and efficient guided practice.
- Modify instructional plans based on ongoing analysis of the individual's learning progress.
- Facilitate instructional planning in a collaborative context.
- Develop a variety of individualized transition plans.
- Use appropriate technologies to support instructional planning and individualized instruction.

## 8. Assessment

- Use multiple assessment types of assessment information.
- Understand the legal policies and ethical principles of measurement and assessment.
- Understand measurement theory and practices.
- Understand the appropriate use and limitations of various types of assessment.
- Assure nonbiased, meaningful assessments and decision making.
- Conduct informal and formal assessments of behavior, learning, achievement and environments.
- Identify supports and adaptations required for individuals with ELN.
- Regularly monitor the progress of individuals with ELN.
- Use appropriate technologies to support their assessments.

## 9. Professional and Ethical Practice

- Attend to legal matters along with serious professional and ethical considerations.
- Engage in professional activities that benefit individuals with ELN.
- View themselves as lifelong learners and regularly reflect on and adjust their practice.
- Are sensitive to the many aspects of diversity of individuals with ELN and their families.
- Keep current with evidence-based best practices.

## 10. Collaboration

- Routinely and effectively collaborate with families, other educators, related service providers, and personnel from community agencies in culturally responsive ways.
- Are a resource to their colleagues in understanding the laws and policies relevant to individuals with ELN.
- Use collaboration to facilitate the successful transitions of individuals with ELN across settings and services.

## Admission Requirements

### Regular Admission

Admission to the Special Education Program is based on criteria specified in the requirements of admission to the UMES Graduate School. These standards were devised to ensure that students accepted into the Graduate School were qualified and had a reasonable chance of successfully completing a graduate degree.

Admission criteria include:

A. Baccalaureate degree from an accredited institution.

B. 3.0 grade point average (GPA) or better on a 4.0 scale in undergraduate work.

C. Three letters of recommendation from individuals who can evaluate the applicant's potential for graduate studies and offer insight as to the professional dispositions of the candidate.

D. Maryland passing scores on the Praxis I, or other Basic Skills test, including ACT, SAT, or GRE if not already a certified teacher.

#### Provisional Admission

Applicants who possess an overall GPA of 2.75 may be admitted and given provisional status provided they have passing scores on the PRAXIS I, or other Basic Skills test, including ACT, SAT, or GRE. These students must maintain a 3.50 average in the first nine approved credit hours, six of which must be in Special Education graduate level core courses.

Provisional status students may be required to take undergraduate prerequisites in the areas of education and psychology to remediate content deficiencies before being admitted to regular status. Provisional status students may also be asked to come for a personal interview before being admitted to the program.

#### **Policy On Applicant Rejection**

The University may review a number of different factors to determine whether to admit an applicant to a graduate program, including but not limited to academic achievement, personal and professional references, scores on admission examinations, writing samples, personal interviews, character and integrity, personality, and potential to perform as a graduate student and in the applicable profession. Applicants should consider licensing/registration/credential requirements of a profession in which past personal history or conviction/criminal record may restrict completion of a degree program (the professional phase) and the eligibility to practice in a profession if graduated from a program.

#### **Application Deadlines**

Fall Semester - May 1st  
Spring Semester - November 1st  
Summer Session - April 1st

#### **Retention and Exit Requirements**

The course of study will vary with the experiences and qualifications that individual students bring to the program. A minimum of 30 semester hours will be required for the M.Ed. degree. Students working toward the M.Ed. degree plus certification will need to complete additional hours beyond the 30 semester hours minimum to satisfy the M.Ed. and certification requirements. Undergraduate methods courses and the internship (i.e., EDSP 400, EDSP 401, EDSP 402, EDSP 403, EDSP 416, EDSP 426, EDSP 442, EDSP 450) may not be applied to the M.Ed. degree. However, these courses will be part of the student's overall program if they are essential to meet certification requirements. No more than 12 hours of coursework at the 400 level can be applied toward the M.Ed. requirements. Approved electives may be taken from Special Education, Counselor Education, and other appropriate areas.

All requirements for the Master's degree must be completed within a five-year period. This time limit also applies to any transfer work from other institutions to be included in the student's overall program.

To remain in good standing in the M.Ed. Special Education Program, including the eligibility to earn certification, each student must meet and maintain the following performance criteria:

1. Earn an overall grade point average of 3.0 or higher.
2. Earn no more than one "C" in all courses.
3. Earn no grade in a course lower than a "C" at any time during the program.

In addition, an internship will be required for students applying for initial certification in Special Education. A professional portfolio is developed as part of the internship experience. Prior to taking the internship and seminar (i.e., EDSP 400, EDSP 442, EDSP 450), teacher candidates must take and pass the PRAXIS II, meeting the minimum cut-off scores as determined by the Maryland State Department of Education.

Students must also take and pass a written comprehensive examination within the last 6 credits of their program as well as a professional portfolio. In addition, they must also complete a seminar paper within the last 6 credits of their program. During the course SPED 678, the seminar paper must be approved by the seminar instructor, program coordinator, and department chair.

For additional and elaborative information on the policies, procedures and forms of the program, see the latest *Graduate Special Education Program Handbook* ([www.umes.edu/Education/Default.aspx?id=14976](http://www.umes.edu/Education/Default.aspx?id=14976)).

## **Courses**

*(NOTE: Credit Hours are given in parentheses)*

### Core Courses

*(All students in the program are required to take these courses.)*

- SPED 600 Characteristics of Exceptional Individuals (3)
- EDUC 610 Learning and Instructional Design (3)
- EDUC 690 Introduction to Behavioral Research (3)
- SPED 615 Psycho educational Assessment (3)
- EDUC 625 Applied Behavior Analysis (3)
- EDSP 428 Communication and Collaboration Skills in Special Education (3)
- EDSP 430 Technology in Special Education (3)
- SPED 678 Master's Research Seminar (3)

### Electives

*(Some of these may be required for those seeking Certification in Special Education.)*

- SPED 603 Characteristics and Programming for Individuals with Learning Disabilities (3)
- SPED 605 Characteristics and Programming for Individuals with Mental Retardation (3)
- SPED 607 Characteristics and Programming for Individuals with Behavioral Disorders (3)
- SPED 608 Characteristics & Programming for the Gifted (3)
- SPED 630 Current Legal and Advocacy Issues in Special Education (3)
- SPED 638 Current Trends in Special Education (3)
- SPED 640 Internship in Special Education (3-6)
- SPED 650 Career Education for the Individuals with Disabilities (3)
- EDSP 401 Processes and Acquisition of Reading and Language for Students with Disabilities (3)

- EDSP 402 Materials for Reading and Language for Students with Disabilities (3)
- EDSP 403 Instruction of Reading and Language for Students with Disabilities (3)
- EDSP 404 Assessment, Diagnosis and Remediation of Reading for Students with Disabilities (3)
- EDUC 612 Advanced Educational Psychology (3)
- EDUC 620 Advanced Human Growth and Development (3)

In addition to elective courses within the major, students are encouraged to select electives in related areas such as Counselor Education and Rehabilitation Counseling. Advisors approve electives before they are taken.

### **Course Descriptions**

*(All courses [with the exception of SPED 600, EDUC 612 and EDUC 620] require acceptance into the graduate Special Education program)*

#### ***EDSP 401 Processes and Acquisition of Reading and Language for Students with Disabilities (3)***

This course introduces students to the processes of language development and the relationship and role of language acquisition in reading development for students with disabilities at the elementary and secondary levels. It will analyze the relationship between oral language development, reading acquisition, and written language. In addition, the interactive nature of the reading process, including the impact of phonemic awareness will be addressed. Prerequisite: SPED 600

#### ***EDSP 402 Instruction of Reading and Language for Students with Disabilities (3)***

This course introduces the instruction of reading skills to students with and without disabilities at the elementary and secondary levels. Content includes the development of word attack and comprehension skills and the teaching of expository reading in the content areas. Emphasis is placed on the selection, organization, and evaluation of instructional content, strategies and activities. Prerequisites: SPED 600, EDSP 401

#### ***EDSP 403 Materials for Reading and Language for Students with Disabilities (3)***

This course introduces materials which can be used to provide a variety of reading and language experiences to students with disabilities at the elementary and secondary levels. Both teacher-made and commercial materials will be discussed. The use of children's literature, community resources, and parental support will also be explored. Prerequisites: SPED 600, EDSP 401

#### ***EDSP 404 Assessment, Diagnosis and Remediation of Reading for Students with Disabilities (3)***

This course provides an in-depth analysis of assessment, diagnosis, and remediation of reading problems for students with disabilities at the elementary and secondary levels. A thorough understanding of the diagnostic process is explored as well as remediation techniques for comprehension, vocabulary development, and word attack skills. Attention is given to effectively reporting these results to parents and other professionals. Prerequisites: SPED 600, EDSP 401, EDSP 402, EDSP 403

#### ***EDSP 428 Communication and Collaboration Skills in Special Education (3)***

This course focuses on the nature of oral and written communication theories, models, and definitions; the role of the individual and groups in the communication process; and content and settings for communication. Emphasis will be on developing effective communication skills in the educational setting with a special focus on working with parents and other educators. Prerequisite: SPED 600



*EDSP 430 Technology in Special Education (3)*

This course explores a wide range of assertive technology applications for students with physical, cognitive, communicative, sensory, and/or multiple disabilities. Students will examine the use of technology in combination with effective instructional strategies to enhance learning. In addition, students will examine electronic and print resources for assertive technology information and review research about current practices for the implementation of instructional technology. Prerequisite: SPED 600

*EDUC 610 Learning and Instructional Design (3)*

This course provides advanced skill development in the area of individualized programming, including adaptation and modification of curriculum, instructional design, program development, and evaluation. Learning theory and its application in the classroom are emphasized. Prerequisite: SPED 600

*EDUC 612 Advanced Educational Psychology (3)*

This course emphasizes educational implications of research on child development, cognitive science, learning and classroom instruction. Prerequisite: Graduate Standing

*EDUC 620 Advanced Human Growth and Development (3)*

This course provides advanced study of human growth and development using a life-span approach. Current research and theories in the areas of cognitive processes, learning abilities, social and psychological processes will be examined. Prerequisite: Graduate Standing

*EDUC 625 Applied Behavior Analysis (3)*

This course develops competencies associated with effective individual, group, and classroom management. Systematic analysis of behaviors and the application of behavioral theory in special education are presented. Prerequisite: SPED 600

*EDUC 690 Introduction to Behavioral Research (3)*

This course presents methods and techniques of behavioral research; experience in reading, analyzing, and interpreting behavioral research, as well as writing and critiquing abstracts and developing research proposals. Prerequisite: SPED 600

*SPED 600 Characteristics of Exceptional Individuals (3)*

This course presents an overview of the major types of exceptionalities and their impact on the teaching/learning process. It includes the legal mandates that relate to the field of special education. Prerequisite: Graduate Standing

*SPED 603 Characteristics and Programming for Individuals with Learning Disabilities (3)*

This course presents an overview of learning disabilities. It includes the diagnosis, assessment, etiology, academic, social and behavioral characteristics as well as history, theories, current issues, instructional strategies and delivery systems. Prerequisite: SPED 600

*SPED 605 Characteristics and Programming for Individuals with Mental Retardation (3)*

This course presents an overview of mental retardation. It includes the diagnosis, assessment, etiology, academic, social and behavioral characteristics as well as history, theories, current issues, instructional strategies, and delivery systems. Prerequisite: SPED 600

*SPED 607 Characteristics and Programming for Individuals with Behavioral Disorders (3)*

This course presents an overview of behavioral disorders. It includes the diagnosis, assessment, etiology, academic, social and behavioral characteristics as well as history, theories, current issues, instructional strategies, and delivery systems. Prerequisite: SPED 600

*SPED 608 Characteristics and Programming for the Gifted (3)*

This course presents an overview of gifted and talented individuals. It includes the diagnosis, assessment, etiology, academic, social and behavioral characteristics as well as history, theories, current issues, instructional strategies, and delivery systems. Prerequisite: SPED 600

*SPED 615 Psychoeducational Assessment (3)*

This course presents the selection, administration, and interpretation of comprehensive psychoeducational batteries designed to assess intellectual, behavioral, achievement, and academic abilities. It includes design, construction, and implementation of informal procedures. Prerequisite: SPED 600

*SPED 630 Current Legal and Advocacy Issues in Special Education (3)*

This course presents an in-depth study of legal issues derived from federal and state mandates in special education. It includes the review of administrative and judicial decisions, analysis of due process proceedings, and study of current legal trends in the field. Prerequisite: SPED 600

*SPED 638 Current Trends in Special Education (3)*

This course presents an in-depth analysis of selected topics in the field of education as they relate to exceptional learners. Prerequisite: SPED 600

*SPED 640 Internship in Special Education (3-6)*

This course involves a supervised internship in a setting appropriate to the student's background and level of certification. This course may be taken twice for up to 6 credits. Prerequisite: SPED 600

*SPED 650 Career Education for Individuals with Disabilities (3)*

This course presents a study of pre-vocational and vocational training and career education for individuals with disabilities. Prerequisite: SPED 600

*SPED 678 Master's Research Seminar (3)*

This course provides individualized instruction, direction, and guidance in the research process. A student-generated, independent, comprehensive research paper (i.e., seminar paper) and a professional portfolio are required course products. Prerequisite: SPED 600, EDUC 690, 24 credits of graduate work.

**For more information on this program, please contact:**

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## Ed.D., Education Leadership

### **Introduction**

The focus of the Doctorate of Education (Ed.D.) is to produce ethical and humane leaders for Maryland and the nation's schools who are:

1. Sensitive to the diverse needs and individuals who attend our schools and who will seek to provide an equal and quality education for all children.
2. Instructional leaders able to build an effective team-oriented approach to teaching and learning in order to maximize the academic achievements of all students.
3. Scholar practitioners with reflective, problem solving habits who are able to design, consume, critique and implement research relevant to effective practice.
4. Adaptable to changing environments and problems, to solving new problems, and developing adaptive learning environments.

The program is aligned with the standards of the Educational Leadership Constituent Consortium (ELCC), the Interstate School Leadership Licensure Consortium (ISLLC) and the Maryland Instructional Leadership Framework (MILF). It is part of The Professional Education Unit in the Department of Education.

### **Educational Objectives**

Candidates who satisfactorily complete the Education Leadership Program will receive the Doctor of Education degree (Ed.D.) and will be able to demonstrate the following:

1. Leadership skills which demonstrate team-oriented approaches to teaching and learning in order to maximize student achievement.
2. Development of an educational institution's vision and mission.
3. Alignment of the total school culture to student learning and achievement.
4. Monitoring and facilitating the alignment of curriculum, instruction and assessment.
5. Improvement of instructional practices through purposeful observation and assessment of teachers and staff.
6. Regular integration of appropriate assessments into daily classroom instruction.
7. Utilization of multiple sources of data to improve classroom instruction and student achievement.
8. Facilitation of professional development for staff that is focused, sustained, and research-based.
9. Engagement of all stakeholders in a shared responsibility for school and student success.
10. Ability to meet the educational needs of a diverse and multi-cultural student and community population.
11. Ethical standards in all research and education leadership activities.

## Admissions Procedures

Applicants will be considered for admission to the Education Leadership (EDLD) Doctoral Program in accordance with the general admission requirements set forth by the UMES Graduate School. Applications will be reviewed and recommendations concerning admission made to the Dean of Graduate Studies. All applicants must satisfy the following minimum requirements:

1. Earned baccalaureate and Master's degrees from regionally accredited institutions.
2. A minimum of a 3.0 grade point average in the Master's degree.
3. Three years of recent teaching or successful relevant professional experience.
4. State certification for a supervisory position or equivalent.
5. The completed UMES application materials.
6. A writing sample: A sample of the student's writing that can be used to evaluate the student's ability as a writer and potential success in the Doctoral program. The minimum length of the sample is five pages and should not exceed 30 pages. It should focus on a current issue in education.
7. Current criminal background check.
8. An interview.

## Application Deadline

As a cohort-based program, there is usually one admission period per year (fall). The application deadline is **April 1**. Students are responsible to ensure that completed applications and supporting materials are received in the UMES Graduate School by the application deadline. Extenuating circumstances may be considered for late enrollment.

## Program, Retention, and Exit Requirements

The sixty (60) credit hours required for the degree, can be earned within a three-year cohort sequence. The program will include the following elements:

1. A leadership core.
2. A specialization in leadership.
3. A research core.
4. A supervised internship.
5. The creation and defense of a proposal and the subsequent dissertation.

Courses are offered in a nontraditional scheduling format on Friday evening, Saturday and Sunday. A three credit course meets for two weekends in a semester. Students must pursue coursework with the cohort. Students who become out of sequence with the cohort may join the next cohort as space permits. Additional time to complete the program may be granted in accordance with the policies and procedures of the UMES Graduate School. Students must maintain a "B" or better grade in all courses. A grade of P (pass) or F (fail) is reserved for the comprehensive examination and the dissertation.

The program specifics for the Doctor of Education degree in Education Leadership are:

### *A. Core Domains of Leadership (24 semester hours)*

- EDLD 640 Writing for Publication
- EDLD 641 Inclusionary Classroom Practices
- EDLD 642 School and Community Relations
- EDLD 644 Supervision and Professional Development

EDLD 645 Ethics and Diversity  
EDLD 647 Curriculum and Instructional Leadership  
EDLD 648 Planning and Program Evaluation  
EDLD 649 Policy and Politics

*B. Specialization in Leadership (12 semester hours)*

EDLD 662 School Plant Management  
EDLD 664 Advanced School Law  
EDLD 667 School Finance and Resource Allocation  
EDLD 669 Personnel Management and Negotiations

*C. Research Methods and Statistics (9 semester hours)*

EDLD 683 Qualitative Research for Educational Leaders  
EDLD 685 Quantitative Research for Educational Leaders  
EDLD 687 Research Instrument Design

*D. Integrated Internship (3 semester hours)*

EDLD 675 Internship in Administration

*E. Exit Experience (12 semester hours)*

EDLD 899 Doctoral Dissertation with Seminar

*F. Total credits required for Graduation – 60 credits.*

**Advisor and Research Advisory Committee**

Upon admission to the Education Leadership Program, students will be assigned to an Academic Advisor. After passing the comprehensive examination, the student will select a Research Advisory Committee (RAC), consisting of 4 members, which must be approved by the Coordinator of the EDLD Program and the Dean of Graduate Studies.

**Doctoral Internship**

Students are expected to document at least 300 contact hours in the internship experience that is approved by the Professor of Record for EDLD 675 and the Coordinator of the Education Leadership (EDLD) Doctoral Program. The internship must be successfully completed and evaluated before the comprehensive examination can be attempted.

**Comprehensive Examination**

The comprehensive examination must be passed before a student can defend the Dissertation Proposal. The comprehensive examination will be given twice a year. Students may register for it once they have successfully completed all course work and the internship and only have the dissertation and seminar remaining. Students may only take the comprehensive exam twice. In cases where a student fails an element or elements of the Exam, only that or those elements failed will need to be taken on the second attempt.

**The Proposal Defense**

The student and his/her Research Advisory Committee (RAC) will agree upon a dissertation subject and accompanying research design. The proposal manuscript will include the first three chapters (Introduction, Review of the Literature, and Methods) of the final dissertation. The student will follow the current edition of the APA Style Manual regarding referencing.

The Proposal Defense, is an oral examination of the research proposal. The student passes if there are four affirmative votes. If failed, the student must re-defend the proposal within one year. A second failure will result in cancellation of admission. After passing the Proposal Defense, the student officially applies for Advancement to candidacy for the Ed.D. degree and must submit all necessary forms.

### **The Dissertation Defense**

The ability to undertake independent research and provide sufficient evidence of scholarship is demonstrated by submission of an original dissertation, which is required of all candidates for an Ed.D. degree. A minimum of 12 dissertation hours is required to complete the EDLD Doctoral degree program. The candidate has up to four (4) years to successfully defend his/her dissertation from the time he/she was admitted to candidacy. The Dissertation Defense must be held in UMES facilities. The student must be enrolled in at least one credit of EDLD 899 at the time that the dissertation defense takes place. One negative vote constitutes failure. Candidates may be examined no more than twice. After failing the second attempt, the candidate's admission to the graduate program is terminated.

### **EDLD Programs Grading and Retention Policies**

The grading policy for the EDLD program is that students must receive a grade of either "A" or "B" in each course and a grade of "Pass" on the comprehensive examination and the dissertation. A student who receives a grade of "C" or lower in any course must repeat that course. Students must follow the UMES Policies on Academic Honesty.

### **Description of Courses**

*(NOTE: Credit Hours are given in parentheses)*

#### ***EDLD 640 Writing for Publication (3)***

This course is designed assist students in the publication process. It presents tools, techniques, and resources for writing scholarly articles and will assist in the dissertation writing process. It will familiarize the student with various writing styles and focus on improving the writing ability of the student.

#### ***EDLD 641 Inclusionary Classroom Practices (3)***

Emphasis is on the leadership of special education teachers, regular education teachers and the special education program. Students will receive guidance in supporting teachers of students with disabilities in general education classrooms and special education settings, supporting the general education teacher in providing instruction to children with disabilities, and facilitating the acceptance and optimal learning of students with disabilities in a non-segregated, diverse, inclusionary educational environment.

#### ***EDLD 642 School and Community Relations (3)***

This course offers a review of the history and philosophy of education in the United States with a focus on the ideals which fostered growth and change. Students will examine the relationship of the school to the community. Emphasis will be placed on the school community concept, community analysis, community characteristics affecting educational quality, public involvement in educational strategic planning and district evaluation.

#### ***EDLD 644 Supervision and Professional Development (3)***

The nature and function of supervision as related to staff is the focus of the course. A contemporary view of supervision from both a theoretical and practical perspective will be presented. The role of the "supervisor" will be examined as it has evolved from the traditional

model to the instructional leadership model, a model that embraces collegiality and professional development. The course includes strategies and processes they relate to a variety of supervisory models, e.g. clinical supervision, mentoring, differentiated supervision, cooperative development, and professional, self-directed development.

*EDLD 645 Ethics and Diversity (3)*

This course is designed to provide an in-depth analysis of how diversity has impacted education in America. In addition, this course will explore and examine the role of educational leaders in pluralistic school. In addition, the course is designed to provide school leaders with reflective considerations of current and anticipated ethical issues and dilemmas facing education.

*EDLD 647 Curriculum and Instructional Leadership (3)*

The course focuses on effective assessment practices, effective curriculum design, development and implementation, curriculum evaluations and current issues and trends in the subject fields. Attention is given to the professional decisions that must be made about curriculum alignment and assessment. The major focus will be on developing learner centered school cultures that assesses outcomes and understands curriculum alignment and instructional outcomes including state, regional and national standards.

*EDLD 648 Planning and Program Evaluation (3)*

The course is designed to give the administrator the knowledge, skills, strategies, and applications of planning for educational organizations. It will include different planning models to include strategic planning, long range planning, and Total Quality Management.

*EDLD 649 Policy and Politics (3)*

This course will explore the role of politics and public policy in education. It will examine policy models and frameworks, and their application to current policy issues in PreK-12 education. The course is designed around the theoretical frameworks necessary for understanding public policymaking; to offer a perspective on the role that research plays in the policy process; and to provide students with the chance to interpret the context of policy development for current policy issues.

*EDLD 662 School Plant Management (3)*

This course is the study of issues involved in the planning, operation and maintenance of school facilities, buildings, and grounds. Emphasis is on the analysis of leadership beliefs and actions that promote the effective use of existing facilities and possible applications to meet current educational and community needs and culture.

*EDLD 664 Advanced School Law (3)*

This course will include an analysis of selected general legal principles, laws, and law-making agencies that affect leaders and educational institutions. The legislative process will be analyzed with regard to governmental decision-making and the legalities of lobbying. Ethics for school leaders will play a major part of the course.

*EDLD 667 School Finance and Resource Allocation (3)*

Students in this course will become knowledgeable about state fiscal law and will learn to distinguish among the various revenue sources and district budgeting. Business office functions including bid law, purchasing and building fund management will be studied.

*EDLD 669 Personnel Management and Negotiations (3)*

This course will focus on hiring techniques, job analysis and job evaluation procedures that comply with district, state and federal regulations. The collective bargaining process and the interpretation and implementation of an employee collective bargaining agreement will be studied. Evaluation research within applied settings will be examined.

*EDLD 675 Internship in Administration (3)*

This course will utilize University faculty and practicing administrators to analyze topics relevant to the role of the superintendent, including but not limited to school board relationships, the legislative process, lobbying, community relations, program accountability, ethics, and other role-specific concerns. During the internship, the student will be working closely in the Central/District Office with practicing administrative leaders. A minimum of three hundred (300) hours of on-the-job experiences are required to complete the course.

*EDLD 683 Qualitative Research for Educational Leaders (3)*

This is an intensive course in the use of field-based and general qualitative research methods in the study of education. Qualitative research is research that focuses on understanding, rather than predicting or controlling, phenomena

*EDLD 685 Quantitative Research for Educational Leaders (3)*

This course is designed to provide students with the quantitative research skills required of effective executive educational leaders. This course builds on a student's foundation of research and statistics and introduces advanced statistical techniques commonly used in educational research.

*EDLD 687 Research Instrument Design (3)*

The purpose of this course is to write an approved Doctoral dissertation proposal in standard format on a researchable topic in educational administration. The course will help students to integrate knowledge of research design and statistics in a practical fashion to revise and complete the dissertation proposal.

*EDLD 899 Doctoral Dissertation with Seminar (12)*

Students develop and carry out an independent research project related to educational leadership. A minimum of 12 semester hours in this course is required for graduation. Continuous enrollment in this course is required while working on the dissertation project. Seminar meetings will be held with the candidates to help mentor them through the process and move to completion of the dissertation.

**For more information on this program, please contact:**

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## Department of Social Sciences

### Degree Offered

Doctor of Philosophy (Ph.D.): Organizational Leadership

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### Ph.D., Organizational Leadership

#### **Introduction**

The Organizational Leadership Doctoral Program (ORLD) prepares students to engage in leadership activities in educational, nonprofit, and business settings. Our students will explore, expand their knowledge of, and critically evaluate organizational and leadership theories as they develop expertise in research design and academic scholarship. We will equip students with the skills to effectively address organizational policies and practices by actively modeling leadership in their chosen organizational environments. As a result, students will promote ethical and socially responsible behavior as they make meaningful contributions in their communities. Students who satisfactorily complete the Organizational Leadership course of study will receive the Doctor of Philosophy degree and be prepared to:

- Write academic texts proficiently utilizing standard written English and APA formatting.
- Critically evaluate leading organizational and leadership theories.
- Develop the knowledge and skills necessary to design and critically evaluate qualitative and quantitative research.
- Apply and implement either qualitative or quantitative research.
- Development, implement and/or respond to organizational policies and practices.
- Apply theories and practices of ethical and socially responsible behavior.
- Recognize the extent of socio-cultural and economic diversity, both locally and globally and develop skills necessary to work within diverse environments.

#### **Objective of Program**

The Organizational Leadership Program is a Doctoral Degree program for students in mid to advanced career stages. The Organizational Leadership Program accomplishes this mission through advanced learning of organizational theory and research. Additionally, the Organizational Leadership Program contributes to the growing body of knowledge pertaining to organizations. The target of the program includes persons with a master's degree who are currently employed or serve with an organization. The program is offered in a weekend format. Classes are offered at the main campus of UMES in Princess Anne, MD and at the Eastern Shore Higher Education Center (ESHEC) in Wye Mills, MD on Friday evenings, Saturday, and Sunday during Fall, Spring, and Summer Semesters.

#### **Admission**

Applicants will be considered for admission to the Organizational Leadership Program in accordance with the admission requirements set forth by the UMES Graduate School. Applications will be reviewed and recommendations concerning admission made to the Dean of Graduate Studies by the Organizational Leadership Admissions Committee composed of as many as four assessors.

All applicants must satisfy:

1. All general requirements for full admission to graduate programs.
2. An on-site interview that assesses oral/written presentation skills.
3. A written evaluation of work performance by a current or recent supervisor (one of the required letters of recommendation).

The Organizational Leadership Program is a terminal degree program for students in mid to advanced career stages. Applicants represent a wide variety of professional experiences and educational backgrounds.

Students who enter the program must have earned baccalaureate and Master's degrees from US regionally accredited educational institutions or the degree equivalent in another country and demonstrate successful employment in an organization that relates to the specified strand major. Applicants, particularly those demonstrating nontraditional career paths, must clearly articulate on the Statement of Purpose application form the purposes for pursuit of the degree consistent with previous educational background and professional experiences and well-considered career plans.

### **GRE or GMAT Score Requirement**

The Organizational Leadership doctoral program requires the submission of standardized test scores as a criterion for admission. The program prefers the submission of GRE scores, but will accept GMAT scores. If GRE scores are submitted, minimum scores should be at least at the 50th percentile for the verbal reasoning and quantitative reasoning, and a 4.0 in the analytical writing section or above. If GMAT scores are submitted as an alternative to the GRE, minimum scores should be at least at the 50th percentile or above for the analytical writing assessment, integrated reasoning, quantitative and verbal sections.

### **Application Deadline**

As a cohort-based program, there is one admission period per year (Fall). The application deadline for the Fall semester is **March 1**. Students are responsible to ensure that completed applications and supporting materials, including letters of recommendation and official transcripts, are received in the UMES Graduate School by the application deadline.

### **Program, Retention, and Exit Requirements**

All students in the Organizational Leadership program must complete courses on organizational leadership as a field of inquiry (12 semester hours), courses on research and data analysis (15 hours), professional services courses (6 hours), and advanced courses (9 hours). Included in the Ph.D. course of study for all Organizational Leadership students will be a supervised internship/practicum (6 semester hours) that aligns with the student's interests.

Provided that the candidate submits the Application for Candidacy form to the UMES Graduate School, the candidate advances to candidacy after successfully completing all course work; completing the internship, including the scholarly product; passes the comprehensive examination; completes the initial Dissertation Committee meeting; and, successfully completes the Dissertation Proposal Defense. Twelve (12) semester hours of credit are awarded for the satisfactory completion of the dissertation. The comprehensive examination is a minimum one credit. The sixty (60) credit hours in addition to the comprehensive examination required for the degree, can be earned within a three-year cohort sequence. Any applicable transfer credits, up to 12 semester hours, must comply with the transfer of credit provisions of the UMES Graduate School and be approved by the Organizational Leadership

Program Coordinator and the Graduate Studies Dean during the first semester of matriculation.

Students enter the Organizational Leadership Program as members of a Doctoral cohort. Because this program is designed to meet the needs of students who are employed full-time, courses will be offered in a nontraditional scheduling format on Friday evenings, Saturdays and Sundays. Classes are five weeks in duration, and generally meet twice. The remaining three (3) weeks are devoted to individual projects and research. Students must pursue coursework with the cohort. Students who become out of sequence with the cohort may join the next cohort as space permits. The cohort will complete twenty-seven (27) semester hours of coursework during the first year of enrollment in the program: three (3) courses in each of the fall, spring, and summer semesters (9 credit hours per semester).

In the second year, the remaining coursework will be completed. The remaining requirements are scheduled for completion in the third year of the program. Additional time to complete the program may be necessary in accordance with the policies and procedures of the UMES Graduate School. The program's grading and retention policies are listed in a subsequent subsection of this ORLD program text.

The program specifics for the Doctor of Philosophy degree in Organizational Leadership are as follows:

1. Learning

a. *Core Course Requirements (42 semester hours)*

Organizational Leadership as a Field of Inquiry (12 semester hours)

- History and Philosophy of Organizations
- Theories and Processes of Organizations
- Politics, Organizations, and Leaders: Legal and Ethical Issues
- National and International Organizational Research and Development

Research and Data Analysis (15 semester hours)

- Qualitative Research
- Quantitative Research
- Statistical Applications and Interpretations
- Statistics and Information Management
- Multi-variate Statistics

Professional Services (6 semester hours)

- Personnel Development, Management and Evaluation
- Public Relations and Marketing in the Non-Profit Sector

Advanced Courses (9 semester hours)

- Research in Organizational Leadership
- Organizational Policy Analysis and Change
- Advanced Seminar in theory and Methods

2. Engagement

Doctoral Internship/Practicum (6 semester hours)

3. Comprehensive Examination

Comprehensive Exam (1 semester hour)

4. Inquiry  
Dissertation Research (12 semester hours)

#### **Advisor and Research Advisory Committee**

Upon admission to the Organizational Leadership (ORLD) Program, students will be assigned to an Academic Advisor. This person will be responsible for advising on all aspects of the student's progress through the program. Students should also consult for information, forms, specific policies and procedures the ORLD program manuals on the Research Advisory Committee process and the processes leading to graduation.

After passing the comprehensive examination (see the section below), the student will select a Research Advisory Committee (RAC), which must be approved by the ORLD Coordinator and the Dean of Graduate Studies. The Committee will include at least four (4) members selected from the following categories who must have UMES Graduate Faculty Status to be a voting member:

1. RAC Chair: Select from ORLD adjunct and full-time faculty, as well as UMES full-time faculty. Previous Doctoral Committee Chair experience is preferred.
2. RAC Core Faculty: Select from ORLD adjunct and full-time faculty, UMES faculty, or faculty affiliated with another accredited university who have expertise in the student's area of interest.
3. RAC Research Faculty: Select from ORLD adjunct and full-time faculty, UMES faculty, or faculty affiliated with another accredited university who have expertise in research design and/or statistics.
4. Secondary Core or Research Faculty or RAC Associate: This person may be selected because of expertise in a desired area.

The RAC must also include a Dean's Representative, who is assigned by the Dean of Graduate Studies. This person may be one of the committee members.

#### **Comprehensive Examination**

The ORLD Doctoral program holds written comprehensive examinations twice a year, in January and August. To be eligible to sit for the comprehensive examination, the student must be in "good academic standing," that is, the student must have obtained an A or B in all core, research and strand courses and have successfully completed the internship and be registered for ORLD 700 (1 credit hour). The comprehensive examination format is as follows:

1. Examination questions reflecting coursework in core, strand and research, as well as the internship, will be submitted from the ORLD faculty.
2. The examination will be monitored by a proctor who cannot be a grader. Each student will be assigned a number so that "graders" (ORLD faculty) will not know whose examination they are grading. In other words, the comprehensive examination uses a double-blind technique. Up to three graders will assess each question; their scores will be averaged. Averages will not be rounded to the next whole number.
3. The student may hand-write the examination (exam booklet/paper will be provided) or submit answers via a UMES-provided computer (with only word processing capability). Students are allowed to bring a pencil/pen and notes to the exam room. Students may not bring books or other materials into the exam room. The student must inform the ORLD Administrative Assistant two weeks before the examination date whether he/she

will use pencil/pen or computer. After this time, the student is not allowed to waver from this test-taking decision unless, on the day of the examination, there are technical difficulties regarding the use of computers.

4. Room assignment for the exam will be emailed to the student from the ORLD office two (2) weeks before the examination date.
5. Exams are scheduled to be taken over two days. The exam begins on the afternoon of the first day, in a 3 hour time block [1:00 pm—4:00 pm]. Students are expected to arrive by 12 noon for preliminary information and to prepare for the exam. The exam continues in an 8 hour time block on the second day (3 hours in the morning [9:00 am—12:00 noon]; a one-hour lunch break [12:00 noon to 1:00 pm]; and 3 hours in the afternoon [1:00 pm—4:00 pm]). Students are expected to arrive by 8 am on the second day for preliminary information and to prepare for the exam. Testing will begin and end at the specified times listed above. If the student arrives at a later time, he/she will not be provided extra time to complete the examination.
6. The exam proctor will distribute one question at 1 pm on the first day (research question). At 9 am on the second day, the proctor will distribute one question (core question). After lunch on the second day, the proctor will distribute one questions at 1 pm (one specialization questions). At the end of each session, the question and answers will be submitted to the proctor. The student cannot revisit submitted responses.
7. Where students may be provided a choice among the questions to answer, e.g., one of two questions, students who mistakenly respond to both questions will have only the first of the two responses graded. A student may not respond to both questions to attempt to improve the total score for the question. Students must answer questions using the provided ID number – if a student types/writes her/his name on any page of the exam, any question(s) will automatically be marked as a zero and that will count as one attempt.
8. All questions will be scored on a scale of 1-25. The student must pass EACH question with at least an 80 percent score. In other words, the student must score an average of 20 points or higher to pass each question.
9. Comprehensive exam questions are designed to assess the student's knowledge about broad foundational concepts as well as the ability to integrate this knowledge in a manner that graders perceive as indicative of Doctoral status. Graders will expect that the student will cite references according to the 6th or latest edition APA style manual (author, date) throughout his/her writing. There is no required length for a comprehensive examination answer. Passing has to do with quality—not quantity.
10. Students will be informed in writing of their comprehensive examination score. Usually this process of grading takes between 2-4 weeks. They can also receive upon request a summary of graders' comments or review the graded examinations by contacting the Program Coordinator's office.
11. If a student does not pass all portions of the comprehensive examination, he/she will receive a grade of Unsatisfactory for ORLD 700, and must register for one (1) credit hour in ORLD 700 when sitting again for the comprehensive examination. In the event of failing ANY or ALL of the questions, the student may retake the failed section(s) ONLY once. The second examination attempt will be given no earlier than four months after the first examination and no later than one calendar year from the date of the initial examination. If the student fails the re-taken part the second time (or fails to take the failed examination section(s) within one year), his/her admission status is terminated.

### **Doctoral Internship/Practicum**

The Doctoral Practicum is an experiential-based learning opportunity completed as a field experience related to current or future professional interests. Activities must be performed in

an approved setting in concert with fellow professionals. New learning is an essential component of this experience. The practicum will yield a scholarly product that has been supervised by an expert in the field and approved by the program Internship Committee. Repeatable credit (must complete six credits total). Students must gain permission for their specific project from the ORLD Practicum Committee. Students must acquire this permission at least one month before the beginning of the relevant semester to be allowed to register.

## The Proposal Defense

The student and his/her Dissertation Committee will agree upon a dissertation subject and accompanying research design. A quantitative proposal and dissertation manuscript will include the first four chapters (Introduction, Review of the Literature, Theoretical Framework and Hypotheses, and Methodology) of the final dissertation (usually six chapters: Introduction, Review of the Literature, Theoretical Framework and Hypotheses, Methodology, Results, and Conclusions/Discussion). A qualitative proposal and dissertation may contain a different number of chapters than those noted for quantitative proposals. The student will follow the *APA Style Manual* (6th or latest edition) regarding referencing and appropriate citations. The students will follow the *UMES Thesis and Dissertation Style Guide* for specific formatting of the document.

The Proposal Defense, administered by the Dissertation Committee, is an oral examination of the research proposal. All members of the Dissertation Committee must attend the Proposal Defense either in person or via prior approved audio/video technology. If an emergency arises among a Committee member, the Dean of Graduate Studies may substitute that member with the Program Coordinator or the Dean's Representative to the Dissertation Committee so that the Proposal Defense may take place. At least three Dissertation Committee members must be physically present for the proposal defense.

During the Proposal Defense—the oral examination—the Dissertation Committee members examine the student on all aspects of the proposed dissertation research as well as whether the student has the proper motivation, technical and intellectual capacity, and resources to complete the research in partial fulfillment of the requirements for the Doctor of Philosophy degree.

Following the completion of the Proposal oral examination process, the Dissertation Committee will hold a closed meeting in which decisions will be made concerning the final form of the proposal. The student will be called back into the room to hear the Dissertation Committee decision. Dissertation Committee consensus is desired; however, the student passes the proposal with at least three of four affirmative votes. The student is required to bring *ORLD Form B* to the proposal defense. It is expected that the Dissertation Committee will work with the student to make any required changes. When the Dissertation Committee recommends substantive changes in the proposal, the student will not move forward to submit to the UMES Institutional Review Board (IRB) the request for approval of human subjects data collection until all edits have been made. After passing the Proposal Defense, the student is allowed to submit materials as needed to the UMES Institutional Review Board (IRB).

After passing the Proposal Defense, the student is admitted to candidacy provided that he/she submits the application for *Admission to Candidacy*. This application form may be obtained

from the UMES Graduate School. The timeline for Admission to Candidacy is five years after enrollment in the program.

If the student fails the Proposal Defense, he/she must re-defend the research proposal. A second failure or failure to re-defend within one year (but no sooner than 30 working days) of the first proposal defense results in cancellation of admission.

### **The Dissertation Defense**

The ability to undertake independent research and provide sufficient evidence of scholarship is demonstrated by submission of an original dissertation, which is required of all candidates for a PhD degree. A minimum of 12 dissertation hours is required to complete the ORLD Doctoral degree program. Prior to admission to candidacy, the student may register for no more than six (6) dissertation hours. After registering for all 12 required hours, the candidate must register for one dissertation hour per semester and summer session, including the semester or session in which he/she defends his/her dissertation. In other words, the candidate must be continually enrolled in dissertation hours until graduation. The candidate has up to four (4) years to successfully defend his/her dissertation from the time he/she was admitted to candidacy.

The Dissertation Defense MUST be physically attended by ALL members of the candidate's Dissertation Committee, and the Dissertation Defense must be held in UMES facilities. At the completion of the defense, the Dissertation Committee will hold a meeting (without the candidate) to discuss decisions regarding the candidate's pass/fail status and any recommendations for the final form of the dissertation manuscript. The student will be called back into the room to hear the Dissertation Committee decision. The Dissertation Committee has the following alternatives regarding the pass/fail status for the candidate:

1. Accept the dissertation without any recommended changes and sign the appropriate form.
2. Accept the dissertation with recommendations for changes, and, EXCEPT FOR THE DISSERTATION COMMITTEE CHAIR, sign the appropriate form. After the candidate makes the recommended changes, the Dissertation Committee chair will review the dissertation and, upon his/her approval, sign the appropriate form.
3. Recommend revisions to the dissertation manuscript and NOT sign the appropriate form until the candidate has made the changes and submitted the revised dissertation manuscript for Dissertation Committee approval. Then, the Dissertation Committee will sign the appropriate form if they approve of the changes.
4. Recommend revisions and convene a second meeting of the Dissertation Defense. The second defense may take place no fewer than 6 months and no later than 12 months after the first defense. Candidates may be examined no more than twice. After failing the second attempt, the candidate's admission to the graduate program is terminated.
5. Rule the dissertation manuscript and defense unsatisfactory; therefore, the student fails and may not re-defend. Before or after recommended changes, the candidate

fails if two (2) of four (4) Dissertation Committee members do not sign the appropriate form. In addition, the ORLD Coordinator may override any Dissertation Committee pass/fail decision. Circumstances for an override could include *a.)* a dissertation manuscript not in compliance with ORLD specified outline/style; *b.)* failure of the student to comply with IRB human subjects protection requirements; or *c.)* acts of plagiarism and faulty data handling and other examples of academic dishonesty that were found. These problems would go back to the student and the RAC with appropriate action to be taken as warranted, e.g., if an academic honesty or IRB issue and/or revisiting the dissertation manuscript for revision and a subsequent review following the above five pass/fail alternatives.

Although not an ORLD requirement, the Doctoral candidate may request a Public Seminar (open to the public) to serve as a dress rehearsal for the Dissertation Defense. The request should be submitted to the ORLD Coordinator.

### **ORLD Program Grading and Retention Policies**

The grading policy for the ORLD program is simple and straightforward. Students must receive a grade of either “B” or “A” in each program course with a letter grading system (A, B, C & F) and a grade of “S” in comprehensive examination, internship and research credit courses with a “S/F” grading system.

If students believe any grade received in a course is either in error or was the result of “arbitrary and capricious grading,” they should immediately discuss the issue with the faculty member. If this does not result in a satisfactory outcome, they should utilize the formal appeal procedures afforded to them in the UMES Procedures for Review of Alleged Arbitrary and Capricious Grading. Information on these procedures is available in the current edition of the UMES Academic Catalog.

### **Retention policy**

1. A student who receives a grade of “C” in any course must repeat that course.
2. After receiving two final “C” grades (whether receiving two consecutive “C” grades in the process of repeating one course or whether, throughout the duration of the program, receiving two final “C” grades in any two different courses), the student will be dismissed from the program.
3. A student who receives a final course grade of “F” at any time will be immediately dismissed from the program.
4. A grade of “I” (Incomplete) is given in any course only to students who are passing the course at the time of a legitimate emergency. If the “I” grade has not been completed satisfactorily within six (6) months from the conclusion of the 5-week course in which the instructor granted the “I,” the student’s registration for the next sequence of courses is subject to hold. All “I” grades must be completed for the student to sit for the comprehensive examination.



5. Academic dishonesty (e.g., plagiarism, improper citation, fabrication, and/or manipulation of facts and data, cheating, and so on) will not be tolerated in the ORLD program and will be subject to sanctions and penalties prescribed in the campus' academic honesty policy procedures available in the current edition of the UMES Academic Catalog. These sanctions range from failure on an assignment to dismissal from the ORLD program.

6. Students enrolled in internship, comprehensive examination and research credit courses with an "S/F" grading system—898 internship credit, 700 comprehensive examination credit, and 899 dissertation credit—must earn a grade of "S" to continue with the progress to degree. A failing grade in any of these credit courses at any time is subject to review by the program to determine whether the student should be continued in the program or dismissed.

7. Students must advance to candidacy within a five-year time period that begins with their admission into the program. This means that students must complete all coursework, including Internship; successfully pass all portions of the Comprehensive Examination; must successfully defend their Dissertation proposal; and complete all appropriate paperwork for Admission to Candidacy within the five-year period or they will be dismissed from the program.

8. Students must complete all program requirements within a nine-year time period that begins with their admission into the program. This includes all elements of the Admission to Candidacy described above, as well as successful defense and completion of all dissertation requirements, and submission of all appropriate paperwork for graduation from the university within the nine-year period or they will be dismissed from the program.

#### **Altered Timelines for the Program**

Completion of the ORLD degree program requirements within the recommended time frame is contingent on successful completion of all coursework in sequential order and the required examinations. Unsatisfactory performance on or delays in completion of the coursework, the comprehensive examination, the internship, the research proposal defense or the final dissertation examination, and subsequent re-examinations of any of the above, and leaves of absences all necessarily extend the duration of the student's retention and graduation in the program. Consequently, students in the ORLD Program may need to commit additional time and resources beyond the recommended time frame and sequence in accordance with the policies and procedures and timelines for Doctoral degrees of the UMES Graduate School.

## **Course Descriptions**

*(Note: Credit Hours are given in parentheses)*

### Core Requirements

#### Organizational Leadership as a Field of Inquiry

##### *ORLD 601 History and Philosophy of Organizations (3)*

The course traces the development, rationale, and purpose for organizations. Information obtained will serve as the foundational building block for understanding and obtaining an essential perspective of current organizational interactions.

##### *ORLD 602 Theories and Processes of Organizations (3)*

The course examines theories, methods, and practices that influence organizations. Emphasis is placed on organizational performance outcomes and how implementation impacts emerging global markets. Also explored will be the human, conceptual, and technical skills required of all policymakers working collaboratively within organizations to achieve individual, organizational, and societal goals.

##### *ORLD 603 Politics, Organizations, and Leaders: Legal and Ethical Issues (3)*

The impact of ethics as well as the responsible behavior of leaders in organizations are studied. Policies, practices, and their legal implications; resource identification and the need for human services, along with the impact of technology on human rights, will all be explored. Ethics regulations for research on human subjects, including IRB requirements, will be presented.

##### *ORLD 604 National and International Organizational Research and Development (3)*

This course will provide the student with a study of American organizational structures, along with a comparison of emerging influential cultures which impact international markets, and global performance.

#### Research and Statistics

##### *ORLD 610 Qualitative Research (3)*

The course is an introduction to the field of qualitative research through the development of knowledge base and application of research skills and methodologies needed to select, read, and interpret relevant professional literature. Ethics regulations for research on human subjects, including IRB requirements, will be presented. Research reports are emphasized.

##### *ORLD 611 Quantitative Research (3)*

This course is introduction to the field of quantitative research through the development of knowledge base and application of research skills and methodologies needed to select, read, and interpret relevant professional literature. Ethics regulations for research on human subjects, including IRB requirements, will be presented. Research reports are emphasized.

##### *ORLD 612 Statistical Applications and Interpretations (3)*

The course covers fundamentals of research and case study design, focusing on implementation strategies that address organizational policies and practice. There is also a study in paradigm shifts and analysis of literature in the field of study. Cultural and technological influences, how public, private and corporate systems are altered by interpretative data, are also covered. In order to enroll in ORLD 613, the student must earn a grade of "A" or "B" in ORLD 612.

### *ORLD 613 Statistics and Information Management (3)*

The course covers the study and use of statistics in a diverse, global society and the effective use of derived information to provide for orderly transitions in institutional governance. The student may not enroll in this course unless s/he has earned a grade of "A" or "B" in ORLD 612.

### *ORLD 614 Multi-Variate Statistics (3)*

This course addresses the multivariate analysis of quantitative data at the intermediate level. The course will emphasize skills and knowledge that are crucial and practical for participation in the community of Doctoral-level researchers and for meeting professional obligations as PhDs.

## Professional Services

### *ORLD 617 Personnel Development, Management, and Evaluation (3)*

The course covers leadership strategies required in recruitment, development, and in-service, effective use of personnel staff, and the evaluation techniques which will promote a highly motivated professional delivery system.

### *ORLD 618 Public Relations and Marketing in the Non-Profit Sector (3)*

Topics include interdisciplinary approaches to achieving harmony in making systems and organizations apparently seamless, publicly attractive, economically sound, and professionally ethical.

## Advanced Courses

### *ORLD 620 Research in Organizational Leadership (3)*

This seminar will focus on scholarly writing and publishing. Scholarly writing is the deliberate dissemination of ideas and among persons trained in an academic discipline or profession with the intent expanding the available base of knowledge. This dissemination can be in the form of journal articles, book chapters, or books. The goal of this seminar is to produce researchers and scholars who will contribute to the knowledge base of organizational leadership.

### *ORLD 623 Organizational Policy Analysis and Change (3)*

This course will assist students in understanding how to perform an organizational analysis and how to use it to improve effectiveness. Students will understand: how learning builds organizational performance; how organizations can strategically leverage knowledge; how organizations and communities design and sustain effective change strategies; apply theories of learning and performance, knowledge management, and strategic change; and how to analyze social policies that affect organizations. This course is designed to give the student the theoretical and practical skills necessary to achieve those goals.

### *ORLD 624 Advanced Seminar in Theory and Methods (3)*

This course will be a final class intended to aid the students in tying current theory and research methods together for the basis of their dissertation proposal. The topic of the seminar is the relationship between contemporary theories of organizational leadership and their linkage to research design and method selection. The final product of the seminar is expected to be a defensible dissertation proposal.

## Doctoral Internship

#### *ACOL 898 (1-6)*

The Doctoral internship is an experiential-based learning opportunity completed as a field experience related to current or future professional interests. Activities must be performed on site in concert with fellow professionals. Insight through engagement of academic organizations, governmental agencies, and/or health and human services agencies must be available. New learning is an essential component of this experience that will yield a scholarly product that has been supervised by an expert in the field and approved by the student's research Advisory Committee. Repeatable credit.

#### Comprehensive Examination

#### *ORLD 700 Comprehensive Examination (1-6)*

This is a required course for students eligible to sit for the comprehensive examination and for those who must retake any part of the comprehensive examination. Prerequisite: Successful completion of all core, research and strand courses and the internship. Repeatable credit.

#### Doctoral Dissertation

#### *ORLD 899 (1-12)*

The Doctoral dissertation in the Organizational Leadership Program is a self-directed, analytical, and comprehensive product of scholarly inquiry which will stand as a model within the field of professional literature. This project, demonstrating excellence, will be the center piece of the academic experience that will add to the body of knowledge relative to organizational leadership and contribute to the human endeavor. The dissertation will be conducted in accordance with the policies and procedures of the UMES Graduate School. Repeatable credit.

#### **For more information on this program, please contact:**

Prince A. Atttoh, Ph.D.

Graduate Program Coordinator

Organizational Leadership Program

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Princess Anne, MD 21851

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# SCHOOL OF BUSINESS AND TECHNOLOGY

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[www.umes.edu/sbt/](http://www.umes.edu/sbt/)

## Department of Mathematics and Computer Science

### **Degree Offered**

Master of Science (M.S.), Applied Computer Science

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### **M.S., Applied Computer Science**

The Department of Mathematics and Computer Science offers a Master of Science (Thesis or Non-thesis option) in Applied Computer Science. This program provides advanced understanding, knowledge and research opportunities related to computer science that prepare students for applying their skills in business, industry, academia, government agencies, consultancy, etc. The primary emphasis is reflective of current theoretical and applied computing in multi-disciplinary applications.

The graduate program in Applied Computer Science (APCS) culminates in a Master of Science (M.S.) degree. It is designed to meet the needs of students such as:

A. Those who are already in the workforce and wish to update or improve their knowledge of current computer science (many of these students will have completed their undergraduate or graduate work in fields other than computer science); and

B. Those who have recently completed an undergraduate degree program and wish to enhance their interests, understanding and research opportunities in Computer Science and its application in multiple disciplines or with specific focus.

### **Admission Criteria**

Admission to this program adheres to the general criteria for admission to the UMES Graduate School. The general GRE is also required but, in view of the wide variety of fields from which students come, the Computer Science subject-matter GRE is not employed in admission consideration for Applied Computer Science. Students with undergraduate GPA's of at least 2.75 on a 4.0 scale and those students with weaker preparation in Computer Science may be offered Provisional Admission. This status is usually changed to Regular Admission as soon as the student completes prerequisite requirements and/or achieves a 3.0 or better cumulative GPA. Students whose computing background is weak may be directed to take undergraduate computer science or mathematics courses as a condition for entering the graduate program. Courses required for Regular Admission must be completed as early as possible, generally within the first year.

In addition to the University of Maryland Eastern Shore's general admission requirements, applicants must have:

1. A bachelor's degree in Computer Science or Information Sciences or a bachelor's degree and specified background course determined by the Department Graduate Committee.

2. An undergraduate GPA of at least 2.75 on a 4.0 scale for provisional Admission, which may also be conditional on some course requirements (in computer science or mathematics) to be met, determined by the Departmental Graduate Committee.

Admission to the program is determined by the Departmental Graduate Committee.

### **Course Requirements for Graduation**

Student must earn a minimum of thirty (30) credit hours with Thesis option or thirty two (32) with Non-thesis option to graduate from the program, not including any Provisional Admission course requirements. All courses that are to count towards graduation must be passed with a minimum grade of "B," and students must also pass at least five of these courses with a grade of "A."

The time limit for completing the M.S. degree is five years from the first enrollment in the graduate program. This includes any provisional admission course or other requirements to be met. This requirement is closely monitored by the Department and any exception to the time limit must be approved by the UMES Graduate School.

In the Thesis option, the student is required to take a minimum of eight graduate level courses (24 credits) and six credits for thesis (CSDP699). The thesis must be supervised by a member of the graduate faculty and the initial thesis proposal must be defended with an oral presentation (see below) and approved by the student's thesis committee (three members including advisor). The thesis must be submitted to the department in a bound form after its defense orally which will take place after the thesis research is completed. A student is required to submit at least one journal/conference paper based upon his/her thesis work before its defense.

In the Non-thesis option, the student is required to take a minimum of eight graduate level courses (24 credits) and two 4-credit hour research project courses, CSDP 698 (Master's Project 1) and CSDP 798 (Master's Project 2). CSDP 698 can be taken at most once and must be taken for 4 credits. CSDP 798 may be taken multiple times, the first time for 4 credits, and subsequent times for at least one credit. The project must be approved by the project advisor. A copy of the resulting scholarly paper must be submitted to the department

### **Cooperative Education Program Internship**

Students seeking internship in industry are required to take CSDP 698 (Master's project) or the first three credits of CSDP 699 (Master's thesis), and all required lecture courses before beginning the internship. Students must register for the appropriate cooperative education credit to undertake the internship. The internship should provide a learning experience in computer applications useful to strengthen the Master's project or Master's thesis.

### **Transfer Credit**

- i. Students desiring to transfer graduate credit need to apply for this privilege during their first semester at UMES.
- ii. Students need to remember that an absolute limit of six credits of transfer (two courses) is allowed;
- iii. In general, transfer requires an exact match with the contents of local courses as offered at UMES as determined by the Department's Graduate Committee.

## Application Deadlines

The application deadlines for admissions are as follows:

Fall Semester - April 15 (March 1 for international applicants)  
Spring Semester - October 15 (August 1 for international applicants)  
Summer Sessions - April 15 (December 1 for international applicants)

Only under extenuating circumstances will applications be accepted after a deadline date has passed. This is particularly true for international applicants who are overseas and need a longer time period in which to be reviewed for admission, receive the I-20 form if admitted and to obtain the visa for study in the U.S.

## Computing Resources

The Department has two computer laboratories equipped with over 40 64 bit i7 PCs. These computer facilities and several other campus wide computer facilities are available for all students.

Students in both undergraduate and graduate Computer Science courses benefit from the wide variety of computing resources made available at the University of Maryland Eastern Shore as a member of the University System of Maryland. Both Unix-based and Windows-based systems provide a rich computing environment both for majors and for students in service courses.

Library facilities are extensive and are supplemented each year. Opportunities exist for student participation in faculty research projects. While computer laboratory facilities are open and available all day and evening, most graduate courses are scheduled in the early evening so that those working during the day can participate.

## Curriculum

Except for students who demonstrate to the Admissions Committee an extensive programming background and experience, beyond taking individual programming language courses, the course below, CSDP 600, should be taken by all students during their first semester in this graduate program. If CSDP 600 is required, it will be noted in the Provisional Admission requirements. It carries graduate credit but does not count toward the credits required for graduation from this program.

*CSDP 600                      Advanced programming languages, 3 credits*

Topics include (not limited to): Advanced topics in programming language theory, design and implementation, in depth understanding of data types, binding, scope and extent, abstraction, extensibility and control mechanisms, formal semantics and program verification, alternative programming language paradigms

### I. Core Computer Science Courses:

All of the following courses (CSDP 601, CSDP 602, CSDP 603 and CSDP 605) must be successfully completed by all students in this graduate program.

*CSDP 601                      Analysis and design of algorithms, 3 credits*

Topics include (not limited to); NP completeness and approximation algorithms, design techniques for efficient algorithms such as amortized analysis, dynamic programming and

greedy algorithms. Computational geometry, graph algorithms, primality and other number-theoretic algorithms, specialized data structure techniques such as augmenting data structures, combinational graph reduction and functional repetition

**CSDP 602**                      *Database Management System, 3 credits*

Topics include (not limited to); A study of the theoretical foundations of database management systems. Design and implementation of alternatives for various database models, including, but not limited to, hierarchical network and relational models, comparison of the reliability, security and integrity of various database systems. Implementation of simple database system.

**CSDP 603**                      *Advanced Operating system, 3 credits*

Topics include (not limited to); Structure and functions of operating system, inter-process communication techniques, high-level concurrent programming, virtual memory system, basic queuing theory, security, distributed system, design and implementation of operating systems.

**CSDP 605**                      *Software engineering, 3 credits*

Topics include (not limited to); A formal study of the software development process, lifecycle models, requirements definition specifications, design, implementation, validation, verification, maintenance and reuse, team work on a project.

**II Elective courses:**

From the courses below, starting with CSDP 604 and going up through CSDP 697, students in either the Thesis or Non-Thesis option must successfully complete at least four (4) of these courses. Experimental courses with the designation CSDP 688 are sometimes available prior to permanent inclusion in the catalog.

**CSDP 604**                      *Computer Methods in Statistics, 3 credits*

Topics include (not limited to); principles and applications of probability and statistics needed in graduate studies in various academic areas and to the computer realization of these methods. Review of basic statistical principles.

Pre-requisite: one semester of calculus

NOTE: The department is committed to offer CSDP 604 (Computer Methods in Statistics) as an elective course on demand.

**CSDP 606**                      *Numerical Methods in Computing, 3 credits*

**CSDP 610**                      *Parallel Computing, 3 credits*

Topics include (not limited to); Motivation for parallel computation and survey of different models. Fundamental techniques used in parallel algorithms. Implementation on parallel machines and simulation on clusters of workstations. Distributed computed versus parallel computing model for distributed computing. Examples of distributed programming environment.

**CSDP 613**                      *Computer security, 3 credits*

Topics include (not limited to); Computers and network security, Public-key and private-key cryptography, authentication, digital signatures, key exchanges, key management, certification authorities, distributed trust models, file system security, mail system security, and web security, intruders. Trojan-horse, viruses, covert channels, projects involve the use of available security tools.



**CSDP 615                      *Bioinformatics, 3 credits***

Topics include (not limited to); The primary objective of this course is to expose students to the computational methods and software tools often used in bioinformatics research. Bioinformatics is a new research field where computational models and methods are developed to analyze and interpret biological data and systems. Major topics in this course include sequence alignment and analysis, gene structure and prediction, motif recognition, structure modeling and prediction for RNA and protein sequences, protein identification in proteomics, and haplotyping and phylogenetic trees. The applications of machine learning and data mining algorithms in bioinformatics will also be introduced and studied.

**CSDP 619                      *Artificial neural networks, 3 credits***

Topics include (not limited to); Introductions to various aspects of artificial neural networks, with emphasis on elements of design of trainable systems. Topics include linear and nonlinear neurons, multi-layer networks, back-propagation algorithms, unsupervised learning algorithms, Hopfield networks, and advanced neural network architectures and training algorithms.

**CSDP 628                      *Computer Applications in Education, 3 credits***

**CSDP 638                      *Computer Applications in Science and Mathematics, 3 credits***

**CSDP 648                      *Computer Applications in Industry, 3 credits***

**CSDP 658                      *Computer Applications in Agriculture, 3 credits***

**CSDP 697                      *Special Topic course, 3 credits (can be repeated up to three (3) times for a total of nine (9) credits)***

**CSDP 698                      *Master's Project I, 4 credits***

**CSDP 699                      *Master's Thesis, 6 credits in at least two semesters, 3 credits each***

**CSDP 798                      *Master's Project II, (1-4) credits***

**Computer Science Thesis/Project**

The thesis/project must contain original theoretical/experimental results/ simulation findings that are suitable for publication in a refereed journal/conference/workshop.

**General Guidelines for Master's Thesis/Project Proposal:**

A student in consultation with his/her thesis advisor should decide the thesis topic and submit a thesis/project proposal to the thesis committee (comprising of thesis advisor and two graduate faculty members from within or outside the department who are familiar with the related work). It is required that the student should do the above at least one full semester before the thesis is defended and it should be completed before other work on the thesis or project is started. The department will not approve the defense of the thesis/project if the student fails to submit and have his/her proposal approved by the thesis committee using the above guidelines. If a thesis is to be submitted, the draft will be reviewed by the Graduate School for general thesis format applicable to all graduate programs.

**Proposal Document Format of Thesis/Project:**

The thesis/project proposal is a written document and must follow the outline below.

**Title Page:**

High level abstract description of work undertaken.

**Introduction:**

A detailed discussion on the work undertaken that can be reasonably understood by faculty members not working in this research area.

**Thesis/project statement:**

Precise and concise statement of the thesis/project, e.g. proposed hypothesis to be tested, the thesis to be defended, the project to be defended, questions to be answered, etc.

**Methods:**

Describe the methods and framework to be used to accomplish the thesis/project statement e.g. proposed algorithms, procedures, controls, sample size, experiments, simulation, expected results, its significance, and future extension that might give new technological development, etc.

**Schedule:**

A complete schedule for the completion of thesis/project.

**Interpretation of findings/results:**

A detailed discussion on the interpretation and analysis of the results/findings that have been presented via charts/graphs and its comparison with existing results reported by other researchers.

**Conclusion and future work:**

Statement of your work, difficulties encountered and presentable results. Discussion on this proposed work can be extended with appropriate justification.

**Bibliography:**

A fairly complete annotated bibliography of the area of proposed work in the thesis/project.

**Artifacts:**

A description of any artifacts besides the write-up of the thesis or project (as appendix) i.e. code, user's manuals, etc.

**Signatures:**

A standard acceptance page including the date, all the members of thesis/project committee and the Graduate Coordinator.

**I. Requirements for Thesis Option:**

The following are the general questions (not limited to) that need to be addressed.

**Introduction:**

- Necessary background
- Statement of the problem
- Why is this problem interesting?
- Significance and application of the problem

**Thesis statement:**

- What is the proposed solution?
- What does the solution do?
- Why does the proposed solution solve the problem?
- How is your proposed solution different than others?

**Method:**

- How to address the problem and its solution?
- Combination of proof, implementation and experimentation
- Presentation of results or simulation for the solution
- Interpretation of the solution
- How does this solution different than the existing ones?
- Proof of real contribution

**Annotated bibliography**

- Complete and appropriate
- A thorough literature survey in the pertinent area

**Artifacts**

- Code, user's manual, any other relevant chart or basic conceptual information

**II. Requirements for Non-thesis option:**

**Proposal for Project:**

Necessary background for the proposed work with convincing argument that the project will offer a significant contribution that can generate a scholarly work. The project statement should precisely and concisely describe the work. The methods section should describe the requirements and expectations for the finished product and explain what will be done to assure the quality of the work. The annotated bibliography should convince the committee and readers that the student is well acquainted with techniques/methodologies needed to do the work and these techniques/methodologies have been used to solve similar problems. The contributions should reflect the importance of the work. It is important to discuss how the work will be disseminated to others.

**General comments:**

If the proposal document does not satisfy the above mentioned standards or similar standards for traditional theses, the department will not approve it. Feedback and correction is an integral part of student's education and must be done in consultation with the advisor.

**Project Presentation:**

Oral presentation audience: CS faculty members who may not be acquainted with the topic. A 15 to 20 minute oral presentation of the proposed thesis/project must be carefully organized and given to the members of thesis/project committee and the invited public. During the proposal presentation, a student must answer committee members' questions on topics such as methodology used, organization and literature surveys. After the presentation, the student and the public leave the room while the committee makes a decision on the proposal acceptance. The result will range from unqualified acceptance to unqualified rejection. Students will adhere closely to the proposal for their MS project. A simple restatement of the proposal document will not be acceptable for the proposal presentation. The central ideas of the project document should be presented, but should be augmented by examples and

explanations. The presentation will offer the opportunity to students to practice and improve upon their presentation skills.

*The above guidelines will be followed for the thesis/project proposal and after the student has completed thesis/project work.*

### **Thesis/Project Defense Instructions**

Please also check the Graduate School's Established Procedures for Conduct of the Master's Thesis Examination listed in the Graduate School catalog:

Before scheduling:

Create and write up the thesis/project under the supervision of your thesis/proposal advisor.

Have a verbal agreement with your advisor and the members of the committee that the thesis/project is in final form and has their approval.

7-9 days before the presentation:

Provide copies of your final thesis/project for each of the three members of the thesis/proposal committee.

Arrange for a date, time and place for the defense of your project/thesis. Make sure that all three committee members can attend your defense. Other faculty are welcome to attend. The Department secretary will be of assistance in scheduling a room and posting the announcement of your defense.

Reserve at least 45 minutes for your defense. Your presentation should not exceed 15-20 minutes. Remaining time will be reserved for questions from the audience and committee members

Defense day or after:

Obtain signatures of all the committee members and the Graduate Coordinator on the acceptance page in your thesis/project. A copy of the published paper/scholarly work and a signed copy of your thesis/project must be delivered to the Department Chair.

### **For more information on this program, please contact:**

Dr. Albert E. Casavant

Department of Mathematics and Computer Science

Kiah Hall

University of Maryland Eastern Shore

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## Department of Technology

### Degree Offered

Master of Education (M.Ed.), Career and Technology Education

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### M.Ed., Career and Technology Education

#### **Objective of the Program**

The Department of Technology offers a Master of Education Degree Program (M.Ed.) in Career and Technology Education (CTED). The program is intended to refine the student's knowledge and skills to become master classroom teachers, trainers, resource teachers, specialists, supervisors, and administrators in Career and Technology Education. The program is also designed to prepare teachers and educational leaders to qualify for Advanced Professional Certification (APC) in Maryland.

Students are admitted to the M.Ed. program at the University of Maryland Eastern Shore (UMES). Coursework is offered at UMES, the Maryland Center for Career and Technology Education Studies located at the Baltimore Museum of Industry (BMI), and other satellite sites throughout Maryland. The course of study may vary with the experience, qualifications, and career development needs that individual students bring to the program.

The overall goal of the graduate program in Career and Technology Education is to prepare individuals to become master teachers, administrators, and leaders who are professional, reflective, innovative, value diversity and effective. Graduates will be proficient in developing, instructing, coordinating, and directing quality programs in Career and Technology Education. The following program objectives assist in accomplishing this goal:

1. Provide opportunities for individuals to gain professional knowledge, skills and dispositions in teaching and training.
2. Prepare individuals to build upon the content knowledge they have acquired in their related baccalaureate degree by providing additional professional knowledge and content necessary for advancing careers in teaching and administration.
3. Develop individuals who can implement Common Core State standards, national content standards, and Science-Technology-Engineering-Mathematics (STEM) standards into curriculum, training and instruction.
4. Prepare teachers and leaders who are knowledgeable of research, theory and practice related to effective curriculum development, instruction, assessment and organization and management of CTE classroom and laboratory facilities.
5. Develop teachers and leaders who are professional, committed, reflective, continuous learners, and contributors to the enhancement of the teaching and training profession.
6. Prepare teachers and leaders who demonstrate sensitivity and effective interpersonal skills in working with culturally diverse populations.

#### **Accreditation**

UMES' teacher education and school counseling programs are accredited by the National Council for the Accreditation of Teacher Education (NCATE) and approved by the Maryland State Department of Education (MSDE). The M.Ed. in Career and Technology Education is part of the teacher education programs at UMES.

### **Program Competencies**

Students who complete the M.Ed. program in Career and Technology Education will be expected to demonstrate successful achievement in the philosophy, mission, vision, goals, and evolution of Career and Technology Education. They will develop the following professional competencies:

Knowledge and application of Maryland State standards-based curriculum in Career and Technology Education areas.

Development of administrative and leadership skills in Career and Technology Education.

The ability to conduct research on important topics and issues in education and training, specifically Career and Technology Education.

Application of research and inquiry for the improvement of classroom and laboratory instruction.

Understanding of the learner's physical, cognitive, and emotional development and the implications for learning and instruction.

Knowledge of the social contexts in which education occurs, the philosophical perspectives which influence teaching and learning, and an understanding of personal beliefs related to the role of the teacher and the learner.

Skills and knowledge necessary to assist learners with special needs and diverse cultural backgrounds in an instructionally integrated setting.

Ability to organize and manage a classroom and laboratory on the basis of research, best practices, expert opinion, personal attributes, and student learning needs.

Development and application of a variety of teaching/learning strategies and techniques.

Appropriate use of a variety of approaches to assess and evaluate instructional outcomes.

Use of instructional technology, including computers and media, for classroom, laboratory and professional needs.

Application of theory and best practices in classroom laboratory situations through field experiences.

### **Admission Requirements**

Students who enter the M.Ed. program must possess an earned baccalaureate degree in one of the areas of Career and Technology Education: agriculture, business education, family and consumer sciences, health occupations, technology education, trade and industrial education, or a related content area. Matriculating students must meet all requirements for regular admission to the UMES graduate program. In some cases, provisional admission will be

granted if students have a minimum grade point average of 2.75 along with other requirements.

Applicants must fulfill the following for regular admission:

Complete the graduate school application and related paperwork for a degree program.

Possess an undergraduate cumulative GPA of at least 3.0, or possess a prior graduate degree.  
Submit a passing score on Praxis I, Praxis CORE, ACT, SAT or GRE.

May require a writing sample essay that focuses on current educational issues, as determined by the graduate faculty Admissions Committee.

Submit official transcripts from all higher education institutions attended.

Submit three letters of evaluation/ recommendation that address:

Personal qualities, e.g. character and academic abilities, problem solving, conceptual thinking, and the writing and speaking skills needed to support a rigorous graduate program.

Personal determination and commitment needed to complete the program.

A resume and a statement of purpose for enrolling in the Master's degree program.

Transcripts and academic credentials of all applicants will be reviewed by the Department of Technology's graduate Admissions Committee. Individuals who lack appropriate coursework will be expected to complete the identified course content requirements prior to their enrollment in the capstone research portion of the program.

### **Application Deadlines**

Fall Semester	-	June 1
Spring Semester	-	December 1
Summer Sessions	-	April 1

However, applications will be accepted and reviewed at any time throughout the year.  
Applications take about a month to process and approve.

### **Program of Study**

The M.Ed. program combines Career and Technology Education content with professional education, research, and leadership theory and practice. Graduate level scholarship and research-based content will be presented throughout the program. The essential elements of teaching and assessment, leadership, and educational research will guide instructional decision-making throughout the program.

This is a 30 credit Master's program. There are six required courses (18 credits) concentrated on CTE curriculum, teaching methods, instructional organization and management, administration and leadership, and educational research. The four elective courses (12 credits) that are selected by the student are based on their career needs and goals.

### **Retention and Exit Requirements**

Students enrolled in the M.Ed. program complete a state-approved program of study that includes at least 30 semester hours of graduate credit with a cumulative "B" (3.0) or higher GPA. Six (6) credits are required in a capstone research experience. Of the remaining 24 credits, six (6) are required in Career and Technology Education and six (6) are required in

professional education. Twelve (12) elective credits are selected with approval of the Graduate Advisor based on the student's previous educational experience and future career goals. Overall, twenty-four (24) credits are required at the 600 level or higher and a maximum of six (6) credits can be completed at the 400 level in designated courses. Students will take a written comprehensive examination and complete an action research seminar paper within the last six credits of their program. Students who have completed 27 credits of coursework and have passed the comprehensive examination will be advanced to Master's degree candidacy.

A maximum of six (6) graduate credits will be accepted for transfer into the program from non-USM institutions, provided these credits are directly related to the program and meet the criteria for transfer of credit. No more than six (6) credit hours of "C" grades will be acceptable in the program.

Students must complete the program within three calendar years of advancement to Master's degree candidacy, but no later than their five-year admission period. Full-time candidates in the Career and Technology Education M.Ed. program will be expected to complete the program in one academic year including one summer. Part-time students, who attend uninterrupted, will be expected to complete the program in three years.

The following represents the typical program of study for students pursuing the M.Ed. in Career and Technology Education.

### **Typical M.Ed. Program of Study**

*(Note: Credit Hours are given in parentheses)*

#### Career and Technology Education

<u>Course #</u>	<u>Core Required</u>
CTED 600	Career and Technology Education Content, Methods and Strategies (3)
CTED 602	Career and Technology Education Instructional Management and Organization (3)
CTED 615	Administration and Leadership in Career and Technology Education (3)
EDUC 610	Learning and Instructional Design (3)
CTED 640	Research in Career and Technology Education I (3)
CTED 650	Research in Career and Technology Education II (3)

**Total Required Credits: 18**

#### Graduate Level Electives

Pick six credits from this selection

CTED 607	Coordination of Work Experience Programs (3)
CTED 610	Teaching Adult and Post-Secondary Education Programs (3)
CTED 630	Special Problems in Career and Technology Education (3, 6)
AEED 625	Administration and Supervision of Agriculture Programs (3)
SPED 600	Characteristics of Exceptional Individuals (3)

**Total 600 level Elective Credits: 6**



### Undergraduate Level Electives

Pick six credits from this selection

EDCI 409	Methods of Teaching Reading in the Content Areas I (3)
EDCI 410	Methods of Teaching Reading in the Content Areas II (3)
EDTE 437	Student Performance Assessment (3)
EDTE 445	American Industry & Global Competition (3)
EDTE 467	Instructional Analysis and Curriculum Development (3)
EDTE 482	Core Technologies I (3)
EDTE 483	Core Technologies II (3)
EDTE 487	Foundations of Technology (3)
EDTE 499	Research and Experimentation in Career and Technology Education (3, 6)
AEED 426	Development and Management of Extension Youth Program (3)

Total 400 level Elective Credits: 6

### TOTAL CREDITS 30

### **Course Descriptions**

*(Note: Credit Hours are given in parentheses)*

#### **CTED 600**                      *Career and Technology Education Content, Methods, and Strategies (3)*

This course examines the philosophy, mission, vision, goals, content standards, teaching methods, teaching strategies, and evolution of Career and Technology Education (CTE). Content standards in CTE, technological literacy and the Common Core will be used to identify what students should know and be able to do as a result of a CTE training experience. Participants will examine standards-based teaching/learning strategies including use of instructional technologies that are effective in enabling students to achieve the program goals. The nature of a CTE experience, with its performance-based instruction and assessment, will be explored with special attention given to the program's potential for supporting national STEM (science, technology, engineering and mathematics) initiatives and Maryland's Career Cluster model curriculum.

#### **CTED 602**                      *Career and Technology Education Instructional Management and Organization (3)*

Participants in this course will develop skills and systems for organizing and managing instruction in Career and Technology Education programs. Particular attention will be given to the organization and management of facilities, students, resources and activities for safe and effective learning. Topics will include designing laboratory space, laboratory management, program and instructor effectiveness systems, adapting facilities to reflect diverse student populations, state and national safety laws, teacher liability, identifying funding resources, program advisory committees, student organizations, and the role of professional associations.

#### **CTED 607**                      *Coordination of Work Experience Programs (3)*

A variety of work-based learning programs will be covered including the career research and development program, cooperative work experience, internships, mentorships, job shadowing, and apprenticeships. Mission, trends and current practices in these programs will be discussed. Methods and techniques of coordination in comprehensive and part-time programs at the secondary and adult levels are covered.

**CTED 610**                      *Teaching in Adult and Post-Secondary Education Programs (3)*

Methods and techniques for teaching adult learners in secondary and in post-secondary occupational and technical programs are covered. The needs, interests and motivation of the mature learner are analyzed. Effective strategies in secondary and post-secondary educational settings will be compared and contrasted. Course topics include physiological, psychological and sociological issues in adult education, motivation, life cycles, learning style profiles, post-secondary settings, authentic contextual and self-directed learning, counseling, guidance, and adult critical thinking.

**CTED 615**                      *Administration and Leadership in Career and Technology Education (3)*

The course is designed to prepare individuals to assume instructional leadership positions in the public schools, and specifically, career and technology education programs. The course covers the theories and concepts of educational administration and leadership in Career and Technology Education. Course topics include societal forces that affect educational administration, tasks of administrators, role requirements, and administrative processes, division of responsibility, organizational variables, and administrators as instructional leaders, professional organizations, and ethics.

**CTED 630**                      *Special Problems in Career and Technology Education (3)*

Master's and APC students who desire to pursue a special research problem or project under the direction of their Advisor may register for this course. The course may be repeated twice with different topics and approval of the Advisor.

**CTED 640**                      *Research in Career and Technology Education I (3)*

Students are introduced to the three basic forms of research: historical, descriptive and action research. Emphasis is placed on incorporating action research into classroom teaching and leadership. A variety of databases will be used. The course provides a base for action research methodology. Qualitative and quantitative data treatments will be developed within the context of individual student projects and evaluation of the research literature.

**CTED 650**                      *Research in Career and Technology Education II (3)*

This course reviews topics in research methodology and specific issues concerning writing action research papers. Students learn how to prepare a research proposal for submission to UMES Institutional Review Board, conduct their research by collecting and analyzing data, present their findings and conclusions based on the data. Students will communicate the results of their study in the form of a research study final defense. Prerequisite: Successful completion of CTED 640.

**EDUC 610**                      *Learning and Instructional Design (3)*

Advanced skill development in the area of individualized programming, including adaptation and modification of curriculum, instructional design, program development, and evaluation are covered in this course. Learning theory and its application in the classroom are emphasized.

**AEED 625**                      *Administration and Supervision of Agriculture Programs (3)*

Students learn about concepts in program planning, organizing, directing, staffing, and evaluating as applied to administration and supervision of programs in agriculture.

**SPED 600**                      *Characteristics of Exceptional Individuals (3)*

This course is an overview of the major types of exceptional abilities and their impact on the teaching/learning process. The legal mandates that relate to the field of special education are covered.

**EDCI 409**                      *Methods of Teaching Reading in the Content Areas I(3)*

These courses teach the fundamentals of reading instruction including current theories and methods of reading instruction. These courses also present an overview of reading programs K-12 and consider the integration of reading into the student's areas of specialization at the middle and secondary school levels. These courses emphasize the identification of requisite reading skills, the assessment of reading skill levels (instructional and independent), the development of strategies and materials for reading mastery, and the remediation of reading difficulties.

**EDCI 410**                      *Methods of Teaching Reading in the Content Areas II(3)*

This course addresses the literacy needs of diverse student populations and includes training in specific strategies to facilitate reading comprehension, incorporate writing to increase reading comprehension, interpret standardized test scores, use collaborative learning to promote literacy and content learning, and model processes for assessing literacy growth. It builds on theories and strategies in EDCI 409.

**EDTE 437**                      *Student Performance Assessment(3)*

This course examines how to identify and utilize appropriate student performance criteria to measure student achievement in the cognitive, psychomotor and affective domains. A variety of assessment instruments will be evaluated and developed to document student mastery of instructional objectives.

**EDTE 445**                      *American Industry and Global Competition(3)*

This course is an analysis of American industry in relation to current and future competitive trends. Personnel organizations, personnel needs, production, quality, all aspects of the industry, and competition in selected manufacturing and construction enterprises are covered.

**EDTE 467**                      *Instructional Analysis and Curriculum Development(3)*

This advanced curriculum design course covers how to design a standards-based unit of instruction based on an instructional analysis in a content area in order to develop curriculum materials. Students learn how to design, implement, and evaluate Career and Technology Education curriculum. Emphasis is placed on the integration and utilization of national and state content standards. Based on these standards and the backward mapping process, goals, objectives, indicators, student learning activities, instructional materials, and assessment instruments are designed.

**EDTE 482**                      *Core Technologies I(3)*

Core technologies are the building blocks of all technology systems within the context of the designed world. Mechanical and structural technologies are examined with regard to common components, simple controls, basic system design, safety, and applications. An overview of materials technology will include an examination of ferrous and non-ferrous materials, common industrial forms, and the primary and secondary processing of industrial materials. The course includes an introduction to biotechnology with instructional units devoted to genetics, environmental biotechnology, and the future of biotechnology. Topical investigations and modular activity packages are utilized to enhance understanding of the core technologies.

**EDTE 483**                      *Core Technologies II(3)*

Core technologies are the building blocks of all technology systems within the context of the designed world. Electrical, electronic, optical, fluid, and thermal technologies are examined

with regard to common components, simple controls, basic system design, safety, and applications. The context for the study of these core technologies is the design and development of technology systems to solve practical problems. Communication skills are developed through the documentation of the design and development process. Topical investigations and modular activity packages are utilized to enhance understanding of the core technologies.

**EDTE 487**                      *Foundations of Technology (3)*

This course focuses on the development of knowledge, skills and dispositions regarding the evolution, systems, core concepts, design, and utilization of technology. It addresses the three dimensions of technological literacy: knowledge, ways of thinking and acting, and capabilities with the goal of students developing the characteristics of a technologically literate citizen. The course examines strategies designed to engage students in exploring and deepening their understanding of “big ideas” regarding technology and makes use of a variety of assessment instruments to reveal the extent of that understanding. The nature of a technology education experience with its performance-based instruction and assessment will be explored with special attention given to the program’s potential to invigorate student interest and achievement.

**EDTE 499**                      *Research and Experimentation in Career and Technology Education (3)*

This advanced course focuses on solving technological issues through the problem-solving method. Students identify a technological problem, determine possible solutions, collect data, write a research report, and present their findings. Emphasis is placed on inquiry, utilizing resources, analyzing and synthesizing data, and developing solutions. This course may be repeated twice using different problems with the permission of the graduate Advisor.

**AEED 426**                      *Development and Management of Extension Youth Program (3)*

This course is designed for current and prospective state leaders of extension youth programs. It emphasizes program development, principles of program management, leadership development and counseling, science, career selection, and citizenship in youth programs, field experience in working with low income family youth, and urban work.

**For more information on this program, please contact:**

Dr. Thomas Loveland  
Program Director  
Department of Technology  
University of Maryland Eastern Shore 1425 Key Highway  
Baltimore, MD 21230  
(410) 727-4808 X164  
Email: [tloveland@umes.edu](mailto:tloveland@umes.edu)

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## M.S., Cybersecurity Engineering Technology

The Cyber-security Engineering Technology master's degree is designed to prepare the graduate with the technical knowledge and skills needed to conduct operations that protect and defend information and information systems by ensuring availability, integrity, authentication, confidentiality and non-repudiation. This includes providing for restoration of information systems by incorporating protection, detection and reaction capabilities. The thirty-four (34) semester credit hours Master of Science in Cyber-security Engineering Technology includes twelve (12) credits in core courses, twenty-one (21) credits in technical electives, and a one (1) credit seminar course which focuses on producing a research paper related to Information Assurance and Computer Security.

The objectives of this degree program are to develop graduates who can plan, implement, upgrade, or monitor security measures for the protection of computer networks and information. The program will train graduates who can ensure appropriate security controls are in place that will safeguard digital files and vital electronic infrastructure. In Addition the objective of the degree program will develop graduates who can respond to computer security breaches and viruses.

### Educational Objectives

The educational objective of the Cybersecurity Engineering Technology master's degree are as follows:

1. To prepare graduates with the technical knowledge and skills needed protect and defend computer systems and networks by ensuring availability, integrity, authentication, confidentiality of digital information;
2. To develop graduates who can plan, implement, upgrade, and monitor cyber security measures for the protection of computing infrastructure; and
3. To develop graduates who are able to analyze and address computer security breaches.

### Student Learning Outcomes

Upon completion of the graduate program, students will be able to:

- ☐ Evaluate cyber security needs of an organization.
- ☐ Assess cyber security risk management policies.
- ☐ Measure the performance of cyber security systems.
- ☐ Troubleshoot, maintain, and update cyber security systems.
- ☐ Implement real-time cyber security solutions.
- ☐ Design short- and long-term cyber security strategies and policies.

### Admission Criteria

Admission requirements include a bachelor's degree in a technology related field, such as: Engineering Technology, Computer Science, Information Technology, Software or Computer Engineering, Networking, Information Security or related disciplines. Applications from candidates with bachelor's degrees in non-technical fields may be considered for admission if they provide evidence of work experience in the field of Cyber security (such as a letter from their current supervisor) and possess one or more industry standard security certifications such as CompTia Security+, Certified Information Systems Security Professional (CISSP), Global Information Assurance Certification (GIAC) Security Expert (SE), Cyber Security Program Plan (CSPP), or Certified Cyber Forensics Professional (CCFP). All applicants must show a strong record of academic achievement, as indicated by official transcript(s), three letters of

recommendation, and satisfactory scores on either the Graduate Record Examination (GRE) or the Graduate Management Admission Test (GMAT).

### **Application Deadlines**

Fall Semester - July 1st

Spring Semester - December 1st

Summer Session(s) - April 1st.

### **Course Requirements for Graduation**

The general requirements for those of the non-thesis program are:

1. A minimum of 34 semester credit hours in courses approved for graduate credit with a minimum average grade of "B" in all course work taken.
2. A minimum of 18 semester credit hours in courses numbered 600 or above.
3. Successful submission of a seminar paper is required.

### **Total number of credits and their distribution:**

Required Core Technology Courses	12 Credits
Elective Cyber security Engineering Technology Courses	21 Credits
<u>Seminar Course</u>	<u>1 Credit</u>
Total Credits Required	34 Credits

### **Master of Science in Cyber security Engineering Technology Curriculum Overview**

#### **Core Courses (12 Semester Hours)**

ETCS 600 Statistical Applications for Technology

ETCS 606 Applied Research for Technology

ETCS 620 Project Management for Technology

ETCS 687 Legal and Ethical Issues in Cyber security

#### **Elective Courses (21 Semester Hours)**

ETCS 678 Mobile Wireless Networking and Security

ETCS 680 Networking Technology for Industry

ETCS 681 System Integrity for Cyber security

ETCS 682 Cyber security Administration

ETCS 683 Network Intrusion, Detection and Incidence Response

ETCS 685 Fundamentals of Network Security

ETCS 686 Advanced Network Security

#### **Seminar Course (1 Semester Hour)**

ETCS 690 Master's Seminar

### **Cybersecurity Engineering Technology Course Descriptions**

*ETCS 600 Statistical Applications for Technology 3(3, 0)*

This course presents a broad treatment of statistics, concentrating on specific statistical techniques used in science and industry. Prerequisite(s): Graduate Standing

*ETCS 606 Applied Research for Technology 3(3, 0)*

This course studies the research methods and processes applicable to engineering and technology. Emphasis will be placed on defining research problems, collecting, analyzing,

recording, and interpreting data. Students will be required to conduct a research project.

Prerequisite(s): Graduate Standing

*ETCS 620 Project Management for Technology 3(3, 0)*

This is the introductory project management course, which is a core course in the Master's degree programs. Prerequisite(s): Graduate Standing

*ETCS 678 Mobile Wireless Networking and Security 3(3, 0)*

This course is a comprehensive examination of wireless local area networks, with an emphasis on the IEEE P802.11 family of WLAN standards. Prerequisite(s): Graduate Status or Permission of Instructor

*ETCS 680 Networking Technology for Industry 3(3, 0)*

An advanced study of network technology fundamentals. The course stresses the state of the art developments that support the World Wide Web and a wide array of specific applications. Prerequisite(s): Graduate Standing

*ETCS 681 System Integrity for Cyber security 3(3, 0)*

This course identifies elements of system integrity for Cyber security including firewall design, types of security threats and responses to security attacks. This course also studies the use best practices design, implement, and monitor a network security plan. This course also examines security incident postmortem reporting and ongoing network security activities. Prerequisite(s): Graduate Status or Permission of Instructor

*ETCS 682 Cyber security Administration 3(3, 0)*

This course explores the concepts of governance and how it applies to information systems. Discussion includes the importance of compliance with laws, regulations, policies, and procedures as a means of minimizing risk through mandated security and control measures. Through this course, students also gain an understanding of Cyber security Auditing processes and principles. Prerequisite(s): Graduate Standing

*ETCS 683 Network Intrusion, Detection and Incidence Response 3(3, 0)*

This course presents an exploration of the theory and implementation of intrusion detection and intrusion prevention. Prerequisite(s): ETCS 685 or Permission of Instructor

*ETCS 685 Fundamentals of Network Security 3(3, 0)*

This course presents topics include cryptography, cipher systems, practical security schemes, confidentiality, authentication, integrity, access control, nonrepudiation, and their integration across telecommunications (i.e., computer) networks Prerequisite(s): Graduate Status or Permission of Instructor

*ETCS 686 Advance Network Security 3(3, 0)*

This course covers advance information from topics presented in ETCS 685. Topics include cryptography, cipher systems, practical security schemes, confidentiality, authentication, integrity, access control, nonrepudiation, and their integration across telecommunications (i.e., computer) networks. Prerequisite(s): ETCS 685 or Permission of Instructor

*ETCS 687 Legal and Ethical Issues in Cyber security 3(3, 0)*

This course focuses on the ways that law, ethics and Cyber security overlap and intersect. Besides laws related to Cyber security, the course examines laws related to intellectual property, civil litigation, criminal prosecutions, and privacy. Prerequisite(s): Graduate Standing

*ETCS 690 Master's Seminar 1(1, 0)*

This course serves a dual role. First and foremost, this is a graduate seminar course with the major objective of preparing students for research in practical applications. It will challenge students with a critical and philosophical exploration of the ideas of Cyber security, and will consist of lectures, readings and class discussions in which every student is expected to be an active participant. Since students come to this course with diverse interests in graduate work in Cyber security, the scope of readings and discussions on research and practical applications will be broad. The second role of this course is a capstone graduation requirement for all Masters' students. For that purpose, the goal is to learn the practical skills of giving a presentation and writing a research paper. Prerequisite(s): Permission of Instructor

**For more information on this program, please contact:**

Dr. Derrek B. Dunn  
Program Coordinator  
Department of Technology  
University of Maryland  
Eastern Shore Princess  
Anne, MD 21853  
(410) 651-6465  
Email: [ddunn@umes.edu](mailto:ddunn@umes.edu)



# SCHOOL OF PHARMACY AND HEALTH PROFESSIONS

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## Department of Physical Therapy

### **Degree Offered**

Doctor of Physical Therapy (D.P.T.)

### **D.P.T, Physical Therapy**

### **Objective of the Program**

The Doctor of Physical Therapy (DPT) degree program constitutes the initial professional preparation for students desiring to become physical therapists. Graduates of the program will be prepared to carry out the expanding responsibilities as autonomous health care providers practicing in a variety of clinical settings and in educational and research environments. The DPT Program will also prepare students to contribute to the field of physical therapy through research and other scholarly activities in addition to the utilization of these activities.

### **Accreditation**

The DPT Program is designed to meet the Standards of Practice of the American Physical Therapy Association and the Accreditation Standards set forth by the Commission on Accreditation in Physical Therapy Education.

The Doctor of Physical Therapy Program at the University of Maryland Eastern Shore is accredited by the Commission on Accreditation in Physical Therapy Education (CAPTE), 1111 North Fairfax Street, Alexandria, VA, 22314; telephone: 703-706-3245; email: [accreditation@apta.org](mailto:accreditation@apta.org); website: <http://www.capteonline.org>.

### **Admissions Policy**

The Physical Therapy Admissions Committee selects students for admission. Applicants must meet the following criteria to gain admission to the DPT Program:

1. A Bachelor's degree from US institutions of higher education accredited by a regional accrediting association or the degree equivalent in another country is required.
2. All applicants must successfully complete the following prerequisite courses with a grade of "C" or higher. (*Note: Credit Hours are given in parentheses*)
  - Zoology with Lab OR Biology with Lab (4)
  - Human Anatomy and Physiology with Lab (or its equivalent) (8)
  - Mathematics (Trigonometry or higher) (3-4)
  - Physics with Lab (8)
  - Sociology/Psychology (General, Abnormal or Child) (6)
  - Chemistry with Lab (8)
  - Histology with Lab OR Cell Biology with Lab or Microbiology with Lab (4)
  - (Other upper level Science Courses may be considered) and, Statistics (3)

3. A cumulative 3.0 GPA over all course work earned and a 3.0 average in the science and math courses earned that are a prerequisite to the program (including any courses taken during the spring and the summer preceding the fall admission).
4. Graduate Record Examination. Each applicant is required to take the Graduate Record Examination. The School code is 5400 and department code is 0619. Each applicant's score will be assessed individually.
5. Demonstration of knowledge concerning the physical therapy profession by submitting:
  - a. An essay detailing the reasons the applicant desires to become a physical therapist.
  - b. Documentation of first-hand observation and/or work experience related to the practice of physical therapy. This experience must be substantiated in writing by a licensed physical therapist. It is required that the experiences be at two different types of clinical settings with a minimum of 25 hours in each.
6. Submission of three (3) letters of recommendation addressing both the applicant's moral character and potential as a physical therapist.
7. A personal interview with at least one member of the Physical Therapy Admissions Committee is required.
8. Prerequisite science courses completed within 10 years prior of the expected matriculation year.

Due to certain factors (i.e., number of available clinical sites), the number of qualified students who can be accepted into the DPT Program is limited. The Department of Physical Therapy Admissions Committee will consider such criteria as cumulative GPA, mathematics and science GPA, GRE, prior experience related to the practice of Physical Therapy and personal interview scores in making its decision for admissions.

### **Acceptance Policy**

Upon acceptance to the DPT Program, the student will be notified and be given two weeks to return their statement of intent. If the student accepts the offer of admission:

1. The student must return the signed statement of intent along with a non-refundable acceptance fee of \$700.00. On admission, this acceptance fee will be credited toward tuition.
2. The student must provide official transcripts from all schools attended to the School of Graduate Studies.

### **Application Instructions**

**Physical Therapist Centralized Application Service:** Students seeking admission to the program must complete the application and submit the required documentation using the Physical Therapist Centralized Application Service (PTCAS) at <http://www.ptcas.org>. PTCAS is a web-based application and allows the prospective student to submit one application and distribute to multiple PT programs.

PTCAS will not forward an incomplete application to our program, please ensure that you complete all required materials and submit all required documentation. For example, you will be asked to submit the following: all official transcripts, recommendation forms, GRE scores, and documentation of physical therapy observation hours.

**Supplemental Application:** All applicants must complete the UMES Graduate School application. A non-refundable application fee of \$50 must accompany the application to be considered for admission. Please visit the UMES School of Graduate Studies' website at <http://www.umes.edu/Grad> for details.

### Application Deadline

1. **Early Decision:** Applicants who have only two prerequisite courses to complete after the end of August are eligible for early decision. The GRE scores must be available at the time of application. The Early Decision deadline for applicants is August 15<sup>th</sup> or the closest business day. Please read the PTCAS Early Decision instructions carefully at: <http://www.ptcas.org/ptcas/public/earlydecision.aspx?navID=10737426886>.
2. **Early Admission:** Applicants who have only two prerequisite courses to complete after the end of August are eligible for early admission. The GRE scores must be available at the time of application. Early Admission decisions will be made for applications received between September 1st and November 1st.
3. **Regular Admission:** The deadline for Regular Admission is December 1st. Regular Admission decisions will be made for applications received by the December 1st deadline or the closest business day.

**The program has a rolling admissions process.** If space is available, applications received after December **1st** may be considered for admission.

### General Program Completion Requirements

The program requires completion of didactic course work, clinical internships, independent study, and a research project as partial fulfillment for the Doctorate degree. Core didactic courses include foundational sciences, clinical medicine, physical therapy procedures, and patient management.

The Clinical Education component provides students with the opportunity to apply their didactic knowledge and skills to clinical situations. Through clinical education experiences, students develop problem-solving and clinical decision-making skills. Select clinical affiliations provide students with clinical experience in specialty areas of physical therapy practice.

The independent study/electives component allows students to pursue advanced study in areas of individual interest under the guidance of the physical therapy faculty. Each student is required to complete three credits in independent study/electives which are approved by the student's Academic Advisor.

The Research/Critical Inquiry component consists of one didactic course in research methods and the completion of an extensive independent research project under the direction of a Research Advisor. The research project incorporates all phases of the scientific inquiry process from the formulation of research questions or hypotheses and literature review through data collection and analysis of the results. The student must select a research Advisor by the end of the first year of enrollment in the program. Final project requirements include a written document and an oral presentation. Students are encouraged to publish and/or present their research to professional organizations such as the American Physical Therapy Association and the American College of Sports Medicine.

Each student is initially assigned an Academic Advisor who is responsible for advising the student on all aspects of the student's progress throughout the program. All students must maintain a cumulative 3.0 GPA. The program is full-time continuous enrollment.

## **Retention in Program**

### **1. Didactic Program Phase**

*i.* The grading scale for the Physical Therapy Department is as follows:

A - 90-100%

B - 80-89%

C - 75-79%

D - 65-74%

F - 0-64%

Students must score 75% or above on all clinical performance based assessments (practical examinations) during the curriculum.

- ii.* A final grade of 'D' in any course (lecture and/or lab) during the DPT Program will result in the student being placed on academic probation.
- iii.* Students attaining probationary status twice during the DPT Program are subject to automatic academic dismissal from the program.
- iv.* A final grade of 'D' in any two courses during the DPT Program (lecture and/or lab) results in an automatic academic dismissal from the program.
- v.* A final grade of 'F' in any course (lecture and/or lab) results in automatic academic dismissal from the program.
- vi.* A student who receives a final grade of 'D' in a course (lecture and/or lab) will need to retake the course and will be referred to the faculty member who will make recommendations to the Department Chairman as to how this grade may be removed and the time limit for removal. Failure to remove the grade in a specified time limit may result in dismissal from the program.
- vii.* Students engaging in any unethical practices as outlined by the policies of the University of Maryland Eastern Shore, Code of Conduct of the American Physical Therapy Association, and State or Federal laws may be dismissed from the program.
- viii.* It is the policy of the Graduate School that a student must maintain an average GPA of 3.0 or better. If a graduate student falls below the minimum GPA, he/she has two semesters (not including the summer) in which to bring their average GPA back to a 3.0 or greater. The admission of all students, both degree and non-degree, is continued at the discretion, as applicable, of the Academic Advisor or Committee, the department Chair, the Program Coordinator and the Graduate School. The School of Graduate Studies Office will notify the student via a letter of the probationary status.
- ix.* All courses must be completed in sequence.
- x.* Students are expected to be able to meet the essential technical standards of performance required by the Department of Physical Therapy.

## 2. Clinical Practicum and Affiliation Phase

i. Clinical Affiliation assignments are dependent upon faculty recommendation, Department Chair approval, and availability of clinical sites.

ii. No student may enter the final full-time **summer** clinical affiliations during the 3rd year of the program with a final grade of 'D' or Incomplete in any course or a cumulative GPA below 3.0. Student assignments to each clinical affiliation are dependent on approval of the Physical Therapy faculty. Final affiliations will be delayed and the clinical affiliation assignment will not be made until the 'I' or 'D' is removed or GPA is above 3.0, faculty approval has been granted, and clinical sites are available.

iii. Each clinical affiliation **and** practicum must be passed. A student receiving a failing grade during a clinical affiliation or practicum is automatically dismissed from the DPT Program.

iv. Students not completing a clinical affiliation or practicum for personal reasons may be required to repeat an affiliation or practicum of the same length or make-up the time lost at the same affiliation or practicum site.

v. A student may only repeat or makeup a clinical affiliation or practicum upon approval of the faculty of the Department of Physical Therapy and upon availability of clinical sites.

vi. Students are expected to be able to meet the essential Technical Standards of Performance required by the Department of Physical Therapy and adhere to the Doctor of Physical Therapy clinical education policies and procedures.

## 3. Readmission

i. Students who have been dismissed for academic reasons may seek readmission by submitting a letter of request to the Department Chair. This letter must be submitted within ten calendar days from the date on the letter from the Graduate School notifying the student of his or her dismissal.

ii. Students who have had to withdraw for personal reasons and wish to seek readmission must submit a letter of request to the Department Chair at the time the withdrawal is requested.

iii. The request for readmission will be reviewed by the Department of Physical Therapy faculty. Cases of readmission are considered on an individual basis and are not automatically granted. A student may be readmitted only once to the program, on the basis of the appeal.

### **Reapplication to the Program**

An applicant who has been unsuccessful in obtaining admission into the program and wishes to reapply to the program must do so through PTCAS and resubmit the supplemental application to the Graduate School (along with the non-refundable application fee).

### **Entry-Level Doctorate in Physical Therapy Course Sequence\***

*(Note: Credit Hours are given in parentheses)*

#### Year 1

##### *Fall*

PHYT 601	Advanced Human Anatomy Lecture (4)
PHYT 607	Advanced Human Anatomy Lab (2)
PHYT 605	Life Span Development and Embryology (3)
PHYT 670	Introduction to Health Care Systems and Patient Care (2)
PHYT 600	Advanced Human Physiology (3)
<i>Total: 14 Credits</i>	

#### *Winter*

PHYT 608	Visceral Anatomy Lecture & Lab (1)
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#### *Spring*

PHYT 602	Neuroscience (4)
PHYT 603	Exercise Physiology (3)
PHYT 604	Analysis of Human Movement (4)
PHYT 612	Clinical Medicine I- Pathophysiology (3)
PHYT 681	Research Methods I (3)

*Total: 17 Credits*

#### *Summer*

PHYT 622	Tests and Measures (3)
PHYT 671	Interpersonal Communication and Psychosocial Aspects of Disability (3)
PHYT 620	Intro to Clinical Examination, Evaluation, & Differential Diagnosis (1)
PHYT 621	Physical Therapy in the Acute Care Setting (3)
PHYT 651	Clinical Practicum I (1)
PHYT 789	Research Project – Selection of Research Topic (1)

*Total: 12 Credits*

### Year 2

#### *Fall*

PHYT 615	Clinical Medicine III – Orthopaedics (3)
PHYT 623	PT Procedures I – Physical Agents (2)
PHYT 627	PT Procedures II – Soft Tissue Techniques (2)
PHYT 630	PT Procedures III Musculoskeletal (3)
PHYT 624	Therapeutic Exercise I-Basic & Essentials (3)
PHYT 616	The Integumentary System and Wound Management (2)
PHYT 789	Research Project – Literature Review and Project Design (1)
PHYT 652	Clinical Practicum II (1)
PHYT 658	Clinical Judgment & Integration Seminar (1)

*Total: 18 Credits*

#### *Winter*

PHYT 660	Clinical Affiliation I** (6 weeks) (3)
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*Total: 3 Credits*

#### *Spring*

PHYT 631	Prosthetics and Orthotics (2)
PHYT 626	PT Procedures IV –Electrophysiology (3)
PHYT 625	Therapeutic Exercise II (2)
PHYT 672	Patient and Community Health Education and Promotion (2)

PHYT 632 Therapeutic Exercise III-Exercise Testing and Prescription for Special Populations (2)  
 PHYT 675 Physical Therapy Administration (3)  
 PHYT 789 Research Project – Data Collection I (1)  
 PHYT 653 Clinical Practicum III (1)  
 PHYT 658 Clinical Judgment & Integration Seminar (1)  
*Total: 17 Credits*

*Summer*

PHYT 611 Pharmacology and Laboratory Values for the Physical Therapist (2)  
 PHYT 613 Medical Imaging for the Physical Therapist (2)  
 PHYT 789 Research Project –Data Collection II (1)  
*Total: 5 Credits*

Year 3

*Fall*

PHYT 642 Patient Management-Neuromuscular I (2)  
 PHYT 637 Patient Management- Pulmonary (2)  
 PHYT 634 Patient Management-Musculoskeletal I (2)  
 PHYT 640 Patient Management-Pediatrics I (2)  
 PHYT 789 Research Project - Data Analysis and Research Paper (1)  
 PHYT 661 Clinical Affiliation II\*\* (8 weeks) (4)  
 PHYT 659 Advanced Clinical Judgment and Integration Seminar (1)  
*Total: 14 Credits*

*Winter*

PHYT 643 Patient Management- Neuromuscular II (1)  
 PHYT 635 Patient Management- Musculoskeletal II (1)  
 PHYT 641 Patient Management- Pediatrics II (1)  
*Total: 3 Credits*

*Spring*

PHYT 633 Patient Management-Cardiac (2)  
 PHYT 645 Patient Management Selected Topics (2)  
 PHYT 644 Patient Management – Neuromuscular III (3)  
 PHYT 636 Patient Management– Musculoskeletal-III (3)  
 PHYT 659 Advanced Clinical Judgment & Integration (1)  
 PHYT 674 Professional Development and Practice Issues In P.T. (1)  
 PHYT 789 Research Project – Final Oral Presentation (1)  
*Total: 13 Credits*

*Summer*

PHYT662 Clinical Affiliation III\*\* (8 weeks) (4)  
 PHYT663 Clinical Affiliation IV\*\* (8 weeks) (4)  
*Total: 8 Credits*

TOTAL CREDITS: 128

--Course numbers and sequence subject to change.

--Student must complete 3 credits of PHYT649 Independent Study or electives during the three years of the program prior to the third summer.

\*\* Upon approval of the Department of Physical Therapy Faculty.

## **Course Descriptions**

*(Note: Credit Hours are given in parentheses)*

### ***PHYT 600 Advanced Human Physiology (3)***

This course focuses on the major physiological systems of the human body. Topics in this course will cover function of the cardiovascular, respiratory, musculoskeletal, renal, gastrointestinal, genitourinary, neurological, lymphatic, endocrine, and immune systems at the cellular, organ and systemic levels.

### ***PHYT 601 Advanced Human Anatomy (4)***

This course focuses on the structure and function of the human body with emphasis on the neuromusculoskeletal, cardiovascular and pulmonary systems. Clinical correlations to the anatomical structures will be presented.

### ***PHYT 602 Neuroscience (4)***

This course explores the structure and function of the central, peripheral and autonomic nervous systems on an anatomical, physiological and neurological basis. Three lecture hours and three laboratory hours per week.

### ***PHYT 603 Exercise Physiology (3)***

This course provides an overview of exercise physiology theory and principles and an examination of the physiological responses to both acute and chronic physical activity. The role of exercise physiology in the treatment and rehabilitation of various populations is highlighted.

### ***PHYT 604 Analysis of Human Movement (4)***

This course analyzes normal and abnormal motor function based upon principles of biomechanics, and musculoskeletal anatomy. The student will be able to perform movement analyses of functional activities with regards to kinematics and kinetics. The student's anatomical knowledge will be reinforced and palpation skills will be taught through hands-on laboratory experiences.

### ***PHYT 605 Life Span Development and Embryology (3)***

This course emphasizes a holistic study of normal human growth and development from conception to maturity including embryological development of the major body systems. Emphasis will be placed on the components of sensory and motor development and the development of mature motor patterns. Study will include the four aspects of human behavior and development including biophysical, cognitive, affective, and social. Students will also examine physiological and psychosocial issues involved in the normal aging process.

### ***PHYT 607 Advanced Human Anatomy-Lab (2)***

The course focuses on the structure and function of the human body with emphasis on the neuromusculoskeletal, cardiovascular and pulmonary systems. The students' understanding of the human body in three dimensions will be facilitated through cadaver dissection.

### ***PHYT 608 Visceral Anatomy Lecture and Laboratory (1)***

This course focuses on the structure and function of the human body with emphasis on the gastrointestinal and genitourinary systems. Clinical correlations to the anatomical structures will be presented.



*PHYT 611 Pharmacology and Laboratory Values for the Physical Therapist (2)*

The **first part** of the course will be an overview of the basic components of pharmacology with emphasis on pharmacokinetics and pharmacodynamics. A review of common disease states encountered in clinical practice and their pharmacological interventions will be presented. Students will be engaged in clinical reasoning and application of pharmacological concepts. Emphasis will be placed on exploring the relationship between pharmacology and physical therapy practice, including communication with other health care professionals and decision-making in physical therapy management of patients. The **second part** of this course will introduce the student to critical laboratory tests and the interpretation of laboratory values. Basic hematology will be reviewed focusing on normal and pathological blood levels. An importance will be placed on the interpretation of laboratory data and its impact on safe and effective patient care. Emphasis will be placed on exploring the relationship between patients' laboratory values and physical therapy practice, including communication with other health care professionals and decision-making in physical therapy management of patients.

*PHYT 612 Clinical Medicine I Pathophysiology (3)*

This course provides an introduction to general pathology and the physiological and anatomical changes accompanying disease, injury or abnormal development. Pathophysiology of the following systems is covered: cardiovascular, respiratory, musculoskeletal, renal, gastrointestinal, genitourinary, lymphatic, endocrine, and immune systems. Current concepts and trends in diagnosis and medical management will be presented throughout the course. Mechanisms of disease processes will be examined.

*PHYT 613 Medical Imaging for the Physical Therapist (2)*

This course will cover the principles, procedures, and interpretation of diagnostic imaging techniques. Emphasis is on plain film radiography, CT scans, magnetic resonance imaging, ultrasound, and current imaging technology of all extremity joints, the spine, temporomandibular joint, and the central nervous system. Emphasis will be placed on exploring the relationship between medical imaging and physical therapy practice, including communication with other health care professionals and decision-making in physical therapy management of patients.

*PHYT 615 Clinical Medicine III Orthopedics (3)*

In this course, emphasis is placed on the pathology of the musculoskeletal system, and the physiological and anatomic changes accompanying disease, injury, and/or abnormal development along with current concepts and trends in differential diagnosis and medical and surgical management and rehabilitation.

*PHYT 616 The Integumentary System & Wound Management (2)*

This course will include an overview of the structure and function of the integumentary system, common dermatologic conditions, and the physiology of the normal wound healing process. The etiology and pathophysiology of various types of chronic wounds will be presented including pressure ulcers, arterial and venous insufficiency ulcers, neuropathic ulcers, and burns. The examination, evaluation, and intervention for each type of pathologic condition will be discussed. Students will engage in problem-solving activities through a variety of case study applications.

*PHYT 620 Introduction to Clinical Examination, Evaluation and Differential Diagnosis (1)*

This course will consist of the principles of the patient management model including examination, evaluation, diagnosis, and prognosis. Emphasis will be placed on the process of obtaining a history, performing a systems review, and selecting and administering tests and measures to gather data. The principles of differential diagnosis will be introduced with an emphasis on distinguishing between neuromusculoskeletal and systemic conditions. The course will also cover differential diagnosis of upper and lower extremity conditions of musculoskeletal and non-musculoskeletal origin with the use of upper and lower quarter scanning exams.

*PHYT 621 Physical Therapy in the Acute Care Setting (3)*

Students will be introduced to basic physical therapy examination, evaluation and intervention skills to ensure safe patient interactions including gross assessment skills, patient communication, safe and effective patient positioning and movement, monitoring of vital signs, use of assistive ambulatory devices, universal precautions and sterile procedures. An emphasis is placed on psychomotor performance of examination and intervention skills and will also include safe procedures in transfers, gait training, positioning, and basic patient handling skills. Equipment and procedures utilized in the acute care setting will be introduced including IVs, cardiac monitoring devices, catheters, and respiratory support apparatus.

*PHYT 622 Tests and Measures (3)*

This course presents examination/evaluation skills pertinent to physical therapy including, postural assessment, goniometry, specific and group manual muscle testing, sensation testing, limb length and girth measurements, and reflex testing. Students will apply techniques to specific patient case situations.

*PHYT 623 PT Procedures I – Physical Agents (2)*

The course addresses: 1) the physical principles and physiological effects of physical agents/modalities; 2) the ethical use and application of physical agents in the management of pain, soft tissue trauma, and edema; 3) the role of physical agents/modalities in prevention of secondary complications and their adjunct use to therapeutic exercise and movement therapy; 4) the relationship of physical agents/modalities, temperature regulation and vascular supply, indications and contraindications; and 5) modification in the application of physical agents/modalities in unique patient populations.

*PHYT 624 Therapeutic Exercise I –Basics and Essentials (3)*

This course serves as an introduction to the modality of therapeutic exercise. It includes principles of aerobic conditioning and the use of various types of resistance, range of motion, postural, and breathing exercises along with their therapeutic application to specific regions of the body. Emphasis will be centered on providing a foundation of knowledge and skills that can be used to manage a large number of patient problems seen in clinical practice. Students will be able to design safe and effective therapeutic exercise programs for a variety of patient diagnoses.

*PHYT 625 Therapeutic Exercise II (2)*

This course is a continuation of Therapeutic Exercise I and includes advanced therapeutic techniques for special patient populations in rehabilitation. Special topics techniques such as bariatric rehabilitation, pre-prosthetic training, post-surgical protocols, oncology rehabilitation, and selected topics in neurologic physical therapy will be covered. Therapeutic exercise interventions will also target comprehensive management of the medically complex patient, including lab value and comorbidity analysis. Exercise will be approached from an evidence-based perspective, with appropriate attention to those contributions from the basic

and clinical sciences. Students will gain exposure to more advanced rehabilitation equipment management such as complex seating systems, NeuroCom training, and treadmill unweighting. In addition, web-based activities will give students the opportunity to discuss patient case studies and to analyze current evidence for specific interventions. Problem-based activities in both the laboratory and clinical setting will focus on stimulating effective clinical decision-making.

*PHYT 626 PT Procedures IV – Electrophysiology (3)*

Analysis of the physical and physiological principles underlying the application of therapeutic electricity in patient/client management is provided. Basic principles underlying electro diagnostic procedures are covered.

*PHYT 627 PT Procedures II – Soft Tissue Techniques (2)*

This course encompasses practical and theoretical aspects of soft tissue techniques used in the physical therapy management of musculoskeletal impairments. Emphasis is placed on examination skills, specific tissue examination, and intervention techniques. The potential influence of soft tissue on movement and pain in mechanical and neurological impairments is discussed.

*PHYT 630 PT Procedures III Musculoskeletal (3)*

This course will consist of the principles of upper and lower extremity examination including the special testing of the upper and lower extremity joints and assessment of accessory motion. The principles of joint mobilization as a therapeutic intervention will be included with a discussion of the history, various philosophies, grading systems, and techniques. Joint mobilization techniques specific to the upper and lower extremities will be emphasized.

*PHYT 631 Prosthetics and Orthotics (2)*

This course focuses on patient management for individuals requiring the use of prostheses and orthoses. Emphasis is placed on the skills of examination of limb impairments and evaluation of the factors that influence the normalization of function. Students will develop plans and intervention strategies to maximize the health care of individuals with various amputations and limb impairments. In addition, students will learn to proficiently measure appropriate changes in function and communicate the findings to the prosthetist/orthotist and other members of the health care team.

*PHYT 632 Therapeutic Exercise III -Exercise Testing and Prescription for Special Populations (2)*

This course is designed to introduce basic exercise testing procedures and precautions, as well as exercise prescription for selected patient populations. An emphasis is placed on monitoring patients for normal and abnormal responses to activity, and specific indications and contraindications to exercise. Populations to be addressed will include individuals desiring to return to work or sport activities.

*PHYT 633 Patient Management –Cardiac (2)*

Emphasis during lecture and laboratory experiences will be placed on cardiovascular structure, physiology, function, and the response to acute and chronic exercise. Interventions such as medications, surgical procedures, and exercise will be highlighted, along with the nature of cardiovascular pathology, cardiovascular rehabilitation, prevention strategies, and the role of the physical therapist.

*PHYT 634 Patient Management –Musculoskeletal I (2)*

The course is the first part in a series of physical therapy management and treatment interventions for the musculoskeletal system. Patient examination, differential considerations,

treatment interventions, and re-assessment procedures will be emphasized throughout the course. Musculoskeletal dysfunctions, with and without surgical intervention, of the extremities and evidenced based treatment strategies will be integrated into clinically relevant scenarios. Anatomy, biomechanics, and special tests will be reviewed and applied via classroom education and advanced dissections.

*PHYT 635 Patient Management – Musculoskeletal II (1)*

This course is the second part in the series of physical therapy management and treatment interventions for the musculoskeletal system. Patient examination, differential considerations, treatment interventions, and re-assessment procedures will be emphasized throughout the course. Musculoskeletal dysfunctions, with and without surgical intervention, of the extremities and evidenced based treatment strategies will be integrated into clinically relevant scenarios. Anatomy, biomechanics, and special tests will be reviewed and applied via classroom education and advanced dissections.

*PHYT 636 Patient Management –Musculoskeletal III (3)*

This course is the third part in the series of physical therapy management and treatment interventions for the musculoskeletal system. Patient examination, differential considerations, treatment interventions, and re-assessment procedures will be emphasized throughout the course. Musculoskeletal dysfunctions of the spine, pelvis and TMJ will be emphasized. Evidenced based treatment strategies, with consideration of surgical procedures, will be integrated into clinically relevant scenarios. Anatomy, biomechanics, and special tests will be reviewed and applied via classroom education and advanced dissections.

*PHYT 637 Patient Management –Pulmonary (2)*

Emphasis during lecture and laboratory experiences will be placed on recognition of pulmonary structure, physiology, function, and pathological conditions. The role of physical therapy in the integration of various examination, evaluation and intervention procedures in order to provide acute care, rehabilitation, and prevention programs are also highlighted.

*PHYT 640 Patient Management –Pediatrics I (2)*

This course will cover examination, evaluation, and intervention procedures for common pediatric conditions including primary and secondary neurological, musculoskeletal, developmental, neuromuscular and cardiopulmonary disorders. Influences of psychosocial, cultural, and environmental factors will be addressed for children with special needs and their families/caregivers. Students will be introduced to current principles and legal issues in the provision of pediatric services in community-based and educational programs including family-centered care, practice models, and the Individuals with Disabilities Education Act (IDEA).

*PHYT 641 Patient Management –Pediatrics II (1)*

This course will focus on screening, examination, and evaluation and planning methods used for pediatric patients. A variety of standardized developmental assessment instruments will be examined. Students will learn to select, apply, and analyze developmentally appropriate procedures for pediatric screening, examination, and evaluation. Students will gain experience in the formulation of appropriate plans of care including Individualized Family Service Plans (IFSPs) and Individualized Education Plans (IEPs)

*PHYT 642 Patient Management –Neuromuscular I (2)*

This course is the first part in the sequence of management and treatment of the neurologically impaired adult. The course explores the theoretical basis of traditional and current approaches for the management of persons with CNS, PNS, ANS and congenital disorders of traumatic and/or vascular etiology. The primary concerns are: (a) brief review of

traditional methods, their historical perspectives, strengths and weaknesses; (b) in-depth analysis of evidenced-based evaluation and treatment of patients post-CVA and post selected vascular disorders of cortical etiology, strengths and weaknesses; (c) introduction to theories of motor control, motor learning and skill acquisition and their potential application in skill learning and rehabilitation; (d) current issues in “functional” interventions, strategies and outcome expectations.

#### *PHYT 643 Patient Management –Neuromuscular II (1)*

The course is the second in a sequence of courses that explore the theoretical basis of traditional and current approaches of managing persons with CNS, PNS, ANS disorders of progressive and non-progressive, acquired and/or congenital etiologies. The course focuses on the examination, evaluation, diagnosis, prognosis, and intervention of the adult with impaired motor function and sensory integrity. This course will cover the management of patients with traumatic brain injury (TBI) in the acute and chronic phases of rehabilitation. The role of the physical therapist as a direct caregiver and team member will be discussed.

#### *PHYT 644 Patient Management –Neuromuscular III (3)*

This course is the third in a sequence of courses, which explore the theoretical basis of traditional and current approaches of managing persons with CNS, PNS, and ANS disorders of progressive and non-progressive, acquired and/or congenital etiologies (e.g., Parkinson’s disease). The skills of examination, evaluation, program planning and intervention for the patient with neurological impairments will be emphasized. Attention will also be directed to the environment into which the patient is being discharged, re-evaluation of status, health care regulation changes and their implication of care for patients with dysfunctions of the neurological system.

#### *PHYT 645 Patient Management –Selected Topics (2)*

This course will present examination and intervention skills for management of patients with unique problems such as the rheumatoid diseases, HIV-AIDS, arterial insufficiency, and vestibular dysfunction. This course will also present issues pertinent to the health, function, and physical therapy management of the geriatric client. Normal and abnormal changes in cognition and mobility will be addressed, along with the implications of psychosocial, legal, ethical, and nutritional concerns. Course material will include examination, data collection, and intervention activities geared towards optimizing functional outcomes with geriatric clients. Students will have the opportunity to perform community balance screening activities.

#### *PHYT 649 Independent Study (1-3)*

The independent study offers a means for students to pursue academic interests beyond the scope of course work in the program under the direction of a faculty advisor. The content and methods of study for this course will vary and are arranged by the student and Advisor. Areas of study may include cardiopulmonary, orthopedics, neurology, pediatrics, women’s health, or other fields of study. This is a repeatable credit course. Each student is required to complete three credits of Independent Study or Electives. In lieu of Independent Study, the student may take electives offered by a graduate school of the University System of Maryland as approved by the faculty advisor.

#### *PHYT 651 Clinical Practicum I (1)*

Students are involved in a practical part-time clinical experience in the application of physical therapy procedures while under direct supervision of a clinic instructor. Emphasis is on the management of patients in the inpatient setting. The student will directly apply the knowledge and skills obtained in PHYT 621: Physical Therapy in the Acute Care Setting.

*PHYT 652 Clinical Practicum I (1)*

Students are involved in a practical part-time clinical experience in the application of physical therapy procedures while under direct supervision of a clinical instructor. Students rotate through a variety of clinical settings.

*PHYT 653 Clinical Practicum III (1)*

Students are involved in a practical part-time clinical experience in the application of physical therapy procedures while under direct supervision of a clinical instructor. Students rotate through a variety of clinical settings.

*PHYT 658 Clinical Judgment & Integration Seminar (1)*

This course combines instruction in clinical problem solving through problem synthesis, critical thinking, clinical reasoning, and decision-making. Case studies presented by students are used to facilitate the development of reasoning and decision-making skills that are applicable to current health care issues as well as to clinical practice. Students integrate didactic knowledge with clinical applications through the presentation and discussion of actual patient case studies. Repeatable credit.

*PHYT 659 Advanced Clinical Judgment & Integration Seminar (1)*

This course will focus on advanced clinical problem solving and analysis with an emphasis on the application of differential diagnostic skills. Students will develop skills in critical analysis of complex medical conditions and in formulating appropriate plans for intervention. The course is designed to enhance students' critical thinking abilities that are particularly pertinent to the autonomous practitioner who practices in states with direct access to physical therapy services. Repeatable credit.

*PHYT 660 Clinical Affiliation I (3)*

This clinical session will consist of six weeks of full-time clinical experience. Students will incorporate examination, evaluative and therapeutic procedures presented in the classroom and laboratory in direct patient care under the supervision of a clinical instructor. 40 clinical hours per week/6 weeks.

*PHYT 661 Clinical Affiliation II (4)*

This clinical session will consist of eight weeks of full-time clinical experience. Students will incorporate examination, evaluative and therapeutic procedures presented in the classroom and laboratory in direct patient care under the supervision of a clinical instructor. 40 hours per week/8 weeks.

*PHYT 662 Clinical Affiliation III (4)*

This clinical session will consist of 8 weeks of full-time clinical experience in preparation for competency as an entry-level practitioner. Students will incorporate examination, evaluative and therapeutic procedures presented in the classroom and laboratory in direct patient care under the supervision of a clinical instructor. 40 hours per week/8 weeks.

*PHYT 663 Clinical Affiliation IV (4)*

This clinical session will consist of 8 weeks of full-time clinical experience in preparation for competency as an entry-level practitioner. Students will incorporate examination, evaluative and therapeutic procedures presented in the classroom and laboratory in direct patient care under the supervision of a clinical instructor. 40 hours per week/8 weeks.

*PHYT 670 Introduction to Health Care Systems and Patient Care (2)*

Students are introduced to the role and function of the physical therapist in contemporary health care with an awareness of ethical principles, historical foundations of the profession, current health care issues, and health care economics. The patient management model in physical therapy will also be introduced, including patient examination, evaluation, diagnosis, prognosis, intervention and outcomes. The course will emphasize the team approach to health care in both urban and rural areas and will present strategies to promote cultural competency within the health care system.

*PHYT 671 Interpersonal Communication and Psychosocial Aspects of Disability (3)*

This course focuses on the psychological, social, and cultural contexts of patient care emphasizing those variables identified as important for managing clients with disabilities. Emphasis will be placed on both verbal and non-verbal communication skills. Students develop initial skills in patient interviewing and in establishing a therapeutic therapist-patient relationship. Psychosocial characteristics of various patient populations are discussed. Emphasis is placed on how personal adjustment to disability influences the rehabilitation process. Students explore the various factors affecting the patient, the family, and the patient therapist relationship in situations of chronic illness, disability, and loss.

*PHYT 672 Patient & Community Health Education & Promotion (2)*

This course will explore the basic principles and theories of health care delivery and epidemiology in community based settings. The impact of demographic, cultural, economic and other factors that may affect delivery of health care will also be discussed. The course is designed to promote wellness and prevention through the development of patient and community education programs. Health belief models and adult learning theories and principles will be incorporated in the development and implementation of health education programs for individual patients and local community groups.

*PHYT 674 Professional Development & Practice Issues in PT (1)*

An introduction to job searching skills including resume writing and interviewing skills, preparing for the National Physical Therapy Examination and state licensure procedures are the focus of this course. The course will also include discussion of current and relevant issues facing the physical therapy profession.

*PHYT 675 Physical Therapy Administration (3)*

This course addresses the principles of organization, management, and reimbursement in health care settings. Legal and ethical issues will be discussed including those pertaining to health care personnel administration.

*PHYT 681 Research Methods I (3)*

This course is designed to be a comprehensive review of basic experimental and non-experimental methods for research using the scientific method. Inductive and deductive approaches will be discussed with emphases on casual ordering, theoretical framework development, and hypothesis testing and critical analysis of current literature.

*PHYT 789 Research Project (1)*

This course emphasizes problem formulation suitable for the completion of a Doctoral project. Data collection, hypotheses testing, argumentation from data, and completion of the Doctoral project by the end of the professional training is expected. All research undertaken is supervised by the student's research Advisor. Repeatable credit.

**For more information on this program, please contact:**

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Graduate Program Coordinator

Physical Therapy Program

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## Department of Physician Assistant

### Degree Offered

Master of Medical Science (M.M.S.) Physician Assistant

### M.M.S., Physician Assistant

The 28-month (nine semesters) 120-semester hour course of study is designed to train and prepare the next generation of qualified students for entry into the physician assistant profession. The length of the program and curriculum content is ARC-PA compliant and consistent with PA graduate programs nationally.

### **Accreditation**

The MMS-PAS degree program is fully accredited by the Accreditation Review Commission on Education of the Physician Assistant (ARC-PA).

### **Mission**

The Department of Physician Assistant recognizes its unique heritage as a Physician Assistant program established within a Historically Black College or University (HBCU). The Department further recognizes the paradigms that the visionaries of our parent institution, Delaware Conference Academy challenged in 1886. The first, a historical paradigm, conceived in a society still weighed by the stigmas of bondage, was of a People becoming autonomous, taking command of their future and new found freedom. The second, an intellectual paradigm, born through visionaries, the founding of an institution now known as the University of Maryland Eastern Shore, seeking to spread the fruits of a freedom available to those exposed to the opportunities of higher education. That young institution, by its very existence, was tasked to dispel the educational inequities created by the social, economic and political institutions of its times. Generations later, in response to a new challenge, the University established the Physician Assistant Department to train a relatively new type of health care practitioner - the physician assistant – a profession conceived by other visionaries to dispel inequities in the availability and delivery of health care. The Department of Physician Assistant provides a curriculum of training and study guided by the vision of the founders of the University of Maryland Eastern Shore and of the physician assistant profession; that inequities regardless of their rationale are antithetical to the growth and development of a healthy, productive civil society responsive to the needs and aspirations of its diverse constituents. An education that offers an understanding of these inequities and solutions empowers society's constituents to make informed and ethical decisions about their environment, community, health, and lives.

### **Objective of the Program**

The Master of Medical Science in Physician Assistant Studies (MMS-PAS) degree program constitutes the initial preparation for students desiring to become physician assistants. The national membership organization of physician assistants (American Academic of Physician Assistants - AAPA) and the organization for physician assistant education (Physician Assistant Education Association - PAEA) have endorsed the Master's Degree as the degree for entry into the PA profession. The MMS-PAS degree qualifies PA program graduates to take the Physician Assistant National Certification Examination (PANCE). Successful completion of the PANCE confers the certification (indicated by the "C" in PA-C) required for state licensure allowing the holder to practice medicine under the supervision of a physician. The MMS-PAS curriculum

prepares graduates to practice as primary health care providers and effectively occupy leadership positions in health planning and policy, research, administration, and education.

The MMS-PAS degree prepares future UMES PAs to:

- ☐ Actualize the vision and mission of the University of Maryland Eastern Shore and the Department of Physician Assistant.
- ☐ Be consistent with ARC-PA accreditation standards.
- ☐ Provide a rigorous didactic education in the medical arts and sciences.
- ☐ Provide supervised clinical training which prepares students to meet the expectations of integrity, competency, and professionalism of their colleagues, patients and the community-at-large.
- ☐ Promote a greater understanding of the PA profession and PA education.
- ☐ Engage PA students, practicing PAs and PA educators in a broad range of health related community oriented activities, organizations, health care service providers, local citizens, and policy makers.

The Department will, in accordance with ARC-PA Standards and UMES accreditation requirements, graduate individuals who are:

- a) Trained to provide patient-centered primary care.
- b) Clinically competent as proscribed by the physician assistant profession through its certification process.
- c) Able to practice in ways consistent with the ethics and principles of the physician assistant profession.
- d) Able to provide patient centered care to individual patients, their families and the community-at-large in a professional manner.
- e) Knowledgeable of health disparities and their root causes.
- f) Advocates toward meeting the needs of underserved communities and populations.

The following AAPA approved competencies serve as the foundation for the MMS-PAS curriculum and assessment of student outcomes:

- a) **Medical Knowledge**  
Medical knowledge includes an understanding of pathophysiology, patient presentation, differential diagnosis, patient management, surgical principles, health promotion, and disease prevention. PA students must demonstrate core knowledge about established and evolving biomedical and clinical sciences and the application of this knowledge to patient care in their area of practice.
- b) **Interpersonal and Communication Skills**  
Interpersonal and communication skills encompass verbal, nonverbal and written exchange of information. PA students must demonstrate interpersonal and communication skills that result in effective information exchange with patients, their patients' families, physicians, professional associates, and the health care system.
- c) **Patient Care**  
Patient care includes age-appropriate assessment, evaluation, and management. PA students must demonstrate care that is effective, patient-centered, timely, efficient, and equitable for the treatment of health problems and the promotion of wellness.

d) Professionalism

Professionalism is the expression of positive values and ideals as care is delivered. Foremost, it involves prioritizing the interests of those being served above one's own. PA students must know their professional and personal limitations. Professionalism also requires that PAs practice without impairment from substance abuse, cognitive deficiency, or mental illness. PA students must demonstrate a high level of responsibility, ethical practice, sensitivity to a diverse patient population and adherence to legal and regulatory requirements.

e) Practice-based Learning and Improvement

Practice-based learning and improvement includes the processes through which clinicians engage in critical analysis of their own practice experience, medical literature and other information resources for the purpose of self-improvement. PA students must be able to assess, evaluate, and improve their patient care practices.

### Success at Achieving Goals

As an undergraduate program the Department's lifetime retention rate averaged 78% (2001-2013). The 5-year average 1<sup>st</sup> time PANCE pass rate in February 2013 was 93%. The MMS-PAS program which requires prior completion of an undergraduate degree, a robust combination of specific Medical Core courses in addition to a minimum of 300 hours of health care experience will attract well prepared and well qualified applicants. As a Master's degree conferring program the Department of Physician Assistant anticipates future 1<sup>st</sup> time PANCE pass rate and retention rates comparable to other Master's degree physician assistant programs.

### Application Requirements

The Department will admit qualified candidates to matriculate through the MMS-PAS curriculum of study. Applicants from Health Personnel Shortage Areas (HPSA) or Medically Underserved Populations/Areas (MUA/P) and groups and/or populations underrepresented within the physician assistant profession are encouraged to apply. The Physician Assistant Admissions Committee selects students for admission. Applicants must meet the following minimum criteria for consideration for admission into the MMS-PAS Program:

1. A Bachelor's degree from US institutions of higher education accredited by a regional accrediting association or the degree equivalent in another country.
2. Applicants with a Bachelor's degree earned outside of the US must send their transcripts to the World Education Services for translation then submit the results to CASPA, and complete all Medical Core prerequisite courses (see below) in the United States. No exceptions will be made.
3. All non US citizens and applicants whose first language is not English must complete the TOEFL examination, (Test of English as a Foreign Language, [www.toefl.org](http://www.toefl.org)).
4. All applicants must successfully complete the following Medical Core prerequisite courses with a grade of "C" or higher (within the Bachelor's degree or through coursework at a regionally accredited US institution of higher education).

Medical Core Prerequisite Courses (Note: Credit Hours are given in parentheses)

- Anatomy & Physiology I (3)
- Anatomy & Physiology I Lab (1)
- Anatomy & Physiology II (3)

- Anatomy & Physiology II Lab (1)
  - Genetics (3)
  - Medical Terminology (1)
  - Microbiology (3)
  - Microbiology Lab (1)
  - Nutrition (3)
  - Organic Chemistry I (3)
  - Organic Chemistry Lab (1)
  - Organic Chemistry II (3)
  - Principles of Biology/Zoology I (3)
  - Principles of Biology/Zoology I Lab (1)
  - Principles of Chemistry I (3)
  - Principles of Chemistry 1 Lab (1)
  - Principles of Chemistry II (3)
  - Principles of Chemistry II Lab (1)
5. Prerequisite science courses are to be completed within 10 years prior to the date of admission.
  6. Waiver of selected prerequisite courses or the acceptance of prerequisite science courses completed  $\geq 10$  years prior to the date of admission are at the sole discretion of the Admissions Committee.
  7. All applicants to the PA Program must apply through the Central Application Service for Physician Assistants (CASPA). [www.caspaonline.org](http://www.caspaonline.org).
  8. When completing the CASPA application particular attention should be given to the following:
    - a. The applicant's personal statement detailing their desire to become a physical assistant.
    - b. Three (3) letters of recommendation addressing the applicant's potential as a physician assistant.
    - c. One of the letters of recommendation must be from a practicing physician assistant with whom the applicant has had a minimum of 40 hours of first-hand observation or "shadowing" experience.
    - d. Documentation of a minimum of 300 hours of direct patient contact. (Hours must be completed by the November 1<sup>st</sup> deadline. See PA website for acceptable experience).
  9. Submit a Criminal Background Check with initial application. (A repeat Criminal Background Check is required prior to entry into the clinical year.)
  10. Applicants must have no history of drug abuse or conviction of a felony.
  11. Applicants must have no history of dismissal from another Physician Assistant school for academic or disciplinary reasons.

12. All applicants must be able to meet the program's Technical Standards.

### **Application Deadline**

All applications must be submitted to CASPA by November 1<sup>st</sup> for consideration for the following fall (next year's) entering class. Incomplete CASPA applications will not be considered.

### **Available Seats and Wait List (Alternates)**

1. The program will offer seats to 35 candidates. Class size is determined by the Accreditation Review Commission on Education for the Physician Assistant (ARC-PA).
2. A wait-list of qualified alternate candidates for admission to the program may be maintained to replace previously selected candidates who decline or do not matriculate.

### **Interview and Admissions Criteria**

1. Applicants submitting a complete CASPA application prior to the November 1<sup>st</sup> deadline may be invited for early interview. Otherwise, interview of selected candidates will be conducted December through March.
2. Using criteria developed by the MMS-PAS Program's Admissions Committee the most qualified candidates will be invited to interview.
3. Criteria used by the interviewers in their evaluations of candidates include:
  - a. Past academic performance, grades, grade point averages in undergraduate and required Medical Core courses, GRE scores, extracurricular activities, work experience, length and quality of healthcare experiences.
  - b. Understanding of the history of the PA profession, the role and scope of physician assistant practice.
  - c. Appearance, emotional and intellectual maturity demonstrated during interview including interpersonal skills, the ability clearly communicates and establish rapport with others.
  - d. The competitive applicant should be aware of the uniqueness of a PA program at an HBCU, health disparities, be able to articulate an understanding of diversity, professionalism, cultural competency and have an interest or experience in serving in a medically underserved area.
  - e. All candidates selected for interview must apply for admission into the Graduate School. (See Graduate School application available on the web.)

### **Acceptance Policy**

1. Admission decisions will be based on information contained in the candidate's CASPA application and the result of candidate interviews.
2. Admission decisions will be made no later than March 15<sup>th</sup>.
3. Upon acceptance to the MMS-PAS Program, the candidate will be notified of acceptance and given two weeks to respond to their acceptance letter.

4. A non-refundable acceptance fee of \$1500.00 must accompany the acceptance letter. On admission, this acceptance fee will be credited toward PA program fees.
5. The program reserves the right to rescind acceptance of any candidate offered or seated into the program who has submitted incorrect or false information or documentation.

### Tuition and Fees

Completion of the UMES Master of Medical Science in Physician Assistant Studies program will require 120 semester hours of full-time study over the course of the 28-month (nine semesters) curriculum. The following are the estimated Graduate School tuition and fees expected to be incurred by resident and non-resident students matriculating through the program (2013-2015).

<b>Maryland Resident</b>			
<b>Tuition &amp; Fees</b>	<b>Cost</b>	<b>Required</b>	<b>Total (over 9 semesters)</b>
Graduate	\$ 276.00/sem. hr.	120 required hrs.	\$ 33,120.00
Student Fee	\$ 10	per semester (9)	\$ 90.00
Technology Fee	\$ 33.00	per semester (9)	<u>\$ 297.00</u>
<b>Tuition &amp; Fees only</b>		<b>Total</b>	<b>\$ 33,507.00</b>
<b>Estimated PA Fees:</b> Books, equipment, lab, and activity fees.	\$ 5,812.79	\$ 5,812.79	<u>\$ 5,812.79</u>
		<b>Total Program Costs</b>	<b>\$ 39,319.79</b>

<b>Non-Resident</b>			
<b>Tuition &amp; Fees</b>	<b>Cost</b>	<b>Required</b>	<b>Total (over 9 semesters)</b>
Graduate	\$ 491.00/sem. hr.	120 required hrs.	\$ 58,920.00
Student Fee	\$ 120	per semester (9)	\$ 1,080.00
Technology Fee	\$ 33.00	per semester (9)	<u>\$ 297.00</u>
<b>Tuition &amp; Fees only</b>		<b>Total</b>	<b>\$ 60,297.00</b>
<b>Estimated PA Fees:</b> Books, equipment, lab, and activity fees.	\$ 5,812.79	\$ 5,812.79	<u>\$ 5,812.79</u>
		<b>Total Program Costs</b>	<b>\$ 66,109.79</b>

The following are the estimated PA fees and costs expected to be incurred by students matriculating through the program (2013-2015).

<b>PA Fees/Costs</b>	<b>Didactic Year</b>	<b>Clinical Year</b>	<b>Total</b>
Textbooks	\$3,000.00		\$ 3,000.00
Equipment	\$ 443.79		\$ 443.79
Pepid (information access system)	\$ 150.00	\$ 150.00	\$ 300.00
Standardized Pts/Simulations @ \$40 x 6	\$ 120.00	\$ 120.00	\$ 240.00
Medical Media	\$ 120.00	\$ 120.00	\$ 240.00
SAAPA dues	\$ 95.00	-	\$ 95.00
PACKRAT (assessment exam @ \$40 x 3)	\$ 80.00	\$ 40.00	\$ 120.00
Consultation Jacket (2)	\$ 80.00		\$ 80.00
Senior Banquet	\$ 35.00		\$ 35.00
Name tags (2)	\$ 30.00		\$ 30.00
TPASS (PA student society)	\$ 15.00	\$ 15.00	\$ 30.00
UMES PA student arm patches (2)	\$ 14.00		\$ 14.00
MDAPA dues	\$ 40.00	\$ 40.00	\$ 80.00
MDAPA Conference (Maryland AAPA)	-	\$ 135.00	\$ 135.00
Med Challenger (computer testing system)	-	\$ 50.00	\$ 50.00
Typhon (patient tracking system)	-	\$ 150.00	\$ 150.00
Malpractice Insurance	-	\$ 140.00	\$ 140.00
ACLS/CPR	-	\$ 150.00	\$ 150.00
Exam Master		\$ 100.00	\$ 100.00
CBC		\$ 100.00	\$ 100.00
End of Rotation Exams (8)		\$ 280.00	\$ 280.00
<b>Total:</b>	<b>\$4,222.79</b>	<b>\$1,590.00</b>	<b>\$ 5,812.79</b>

NOTE: Notwithstanding any other provision of this or any other University publication, UMES reserves the right to make changes in tuition, fees, and other charges at any time such changes are deemed necessary by the University and the University System of Maryland Board of Regents.

### **Payment of Tuition and Fees**

All program fees must be paid in accordance with Departmental and UMES policies and payment schedules. (See PA Fees and Graduate School Tuition and Fee Schedule)

### **General Program Completion Requirements**

The program requires successful completion of the 88-semester hour didactic year course work and a 32-semester hour clinical year clerkships which includes a "Capstone Project".

### **Didactic Curriculum**

During the didactic phase students are expected to successfully complete foundational courses which include instruction in; applied medical sciences and their application in clinical practice, clinical medicine covering all organ systems, interpersonal and communication skills, patient evaluation, diagnosis and management, clinical medical care across the life span, technical skills and procedures, social and behavioral sciences, basic counseling and patient education skills, interpreting and evaluating medical literature, health care delivery systems and health policy, concepts of public health, patient safety, quality improvement, prevention of medical errors and risk management, PA licensure, credentialing and laws, regulations regarding professional practice, reimbursement, documentation of care, coding and billing,

principles and practice of medical ethics and the PA profession, it's historical development and current trends in the PA profession.

### **Clinical Curriculum**

During the clinical phase students are expected to successfully complete clinical clerkships under the supervision of board certified physicians, certified physician assistants and licensed midlevel providers with patient encounters over the life-span in preventive, emergent, acute, outpatient, inpatient, emergency department and operating room settings. The clinical education component provides students with the opportunity to apply their didactic knowledge and skills to clinical situations, developing their problem-solving and clinical decision-making skills. Required clinical clerkships are provided in the disciplines of; obstetrics and gynecology, family medicine, internal medicine, general surgery, pediatrics, and psychiatry.

### **Capstone Project**

1. Each student is required to complete a "Capstone Project" approved by the student's Academic Advisor.
2. Students must choose from one of three options: (All Capstone Projects require a final written document and an oral presentation.)
  - A. An evidence based query presentation to peers and Department faculty;
  - B. Completion of a peer reviewed journal article (submission ready); or
  - C. Completion and presentation of a student research project.
3. Students are encouraged to publish or present their research to professional organizations such as the Journal of the American Academy of Physician Assistants (JAAPA), Consultant, Clinician Reviews, or American Academy of Physician Assistants (AAPA) or Maryland Academy of Physician Assistants (MAPA) annual conferences.
4. Each student is initially assigned an Academic Advisor who is responsible for advising the student on all aspects of the student's progress throughout the program.
5. The program requires full-time continuous enrollment. Attendance to all classes is mandatory. Working during the program is strongly discouraged.

### **Retention in Program**

1. All students must maintain a cumulative 3.0 GPA.
2. The grading scale for the Department of Physician Assistant is as follows:
  - A - 90-100%
  - B - 80-89%
  - C - 70-79%
  - D - 60-69%
  - F - Less than 59%
3. Students must attain a score of > 70% in all didactic courses and clinical simulation activities.
4. Students must attain a score of > 80% in all clinical courses.
5. Students engaging in any unethical practices or violation as outlined by the policies of the University of Maryland Eastern Shore, the PA Department Program Student Handbook, or the Guidelines of Ethical Conduct for the Physician Assistant Profession and State or Federal laws may be dismissed from the program.
6. Students must maintain a cumulative GPA of "B" or better in all graduate courses taken and must satisfy all departmental and UMES Graduate School requirements.



7. Unless otherwise recommended and approved by the Academic Progress and Probation Committee, all courses must be completed in sequence.
8. All students must be able to meet the program's Technical Standards. (See PA Department website.)

### **Clinical Clerkships**

1. Clinical clerkship assignments are scheduled by the Clinical Coordinator and are subject to availability of clinical sites.
2. Students are responsible for housing arrangements, expenses, and transportation to their clinical clerkships.
3. Each clinical clerkship must be passed with a cumulative grade of  $\geq 80\%$ .
4. A student receiving a failing grade ( $< 80\%$ ) in any component of the clerkship will be automatically reviewed by the Progress and Promotions Committee.
5. Students not completing or unable to complete a clinical clerkship for personal or health reasons (with proper documentation and approval of the Department Chairman) may be allowed to repeat one clerkship course. The student must be in good academic standing in the clerkship prior to their withdrawal from the clerkship. The student will be placed on academic probation, continues to be responsible for all PA program fees, University tuition and fees, and must complete their remaining scheduled clerkships on time. The student will not graduate with their original class cohort but must delay graduation until the following spring commencement. During the interim period the student is required to repeat the clerkship or be dismissed from the program.
6. A student may repeat only one clinical clerkship for personal or health reasons.

### **Activities used to assure that graduates achieve required professional and program competencies**

1. Periodic review with formative and summative assessments by assigned faculty advisors.
2. Formative and summative assessment of students' knowledge, clinical skills and professionalism using a variety of assessment measures delivered on a regular basis during didactic and clinical courses.
3. Successful completion of a summative evaluation before graduation consists of a comprehensive written assessment of knowledge base, review of professional behavior evaluations, and practical testing of clinical skills with standardized or simulated patients.
4. Completion of an approved "Capstone Project".
5. Monitoring of curricular content and student performance with reference to program goals, ARC-PA standards and AAPA competencies.
6. Administration of the Physician Assistant Clinical Knowledge Rating and Assessment Tool (PACKRAT) at the beginning of the didactic year (baseline), end of the didactic year (midpoint), and end of the clinical year before graduation to benchmark student performance with national norms and assess student core medical knowledge prior to taking the Physician Assistant National Certification Examination (PANCE).

## **Readmission**

1. All dismissals from the program for academic or disciplinary reasons are final and may not be appealed.
2. Students who have been dismissed for academic or disciplinary reasons may not reapply to the program.
3. Students who have withdrawn from the program for health or personal reasons may seek consideration for readmission by submitting a letter to the Department Chairman and reapply to the Graduate School. The letter of consideration will be forwarded to the Progress and Promotions Committee.
4. All decisions regarding readmission are final.
5. A student may be readmitted only once to the program.

## **Reapplication to the Program**

An applicant who has been unsuccessful in obtaining admission into the program may re-apply through CASPA during the next admissions cycle.

## **Course Descriptions**

*(Note: Credit hours are in parentheses)*

### **PHAS 607-A            Regional Anatomy (5)**

Comprehensive survey course on regional anatomy taught over two semesters focused on the structure and function of the human body with emphasis on the head and neck, cardiovascular, pulmonary, gastrointestinal, genitourinary systems, gynecological, neurological, and musculoskeletal systems. This course is designed to provide the student with an in-depth examination of the anatomical structure and function of the human body through cadaver dissection and lecture. This course will be enhanced with Blackboard, Tegrity, Echo 360 and Class Capture software. Prerequisites: Admittance to the Physician Assistant Program.

### **PHAS 607-B            Regional Anatomy (1)**

This continuation anatomy course focuses on the structure and function of the human body with emphasis on the musculoskeletal system, including the upper and lower limbs and back. This course is designed to provide the student with an in-depth examination of the anatomical structure and function of the human body through cadaver dissection and lecture. This course will be enhanced with Blackboard and Echo 360, Class Capture software. Prerequisites: Admittance to the Physician Assistant Program and completion of PHAS 607-A.

### **PHAS 608            Clinical Medicine I (4)**

Comprehensive survey course that studies prioritized medical topics within organ systems. The systems covered are otolaryngology, ophthalmologic, cardiovascular and respiratory systems. Prerequisites: Admittance to the Physician Assistant Program.

### **PHAS 609            Clinical Medicine II (4)**

A comprehensive survey course that studies prioritized medical topics within organ systems. The systems covered are the gastrointestinal, hepatobiliary, genitourinary, endocrine, hematological systems and oncology. Prerequisites: Admittance to the Physician Assistant Program and completion of PHAS 608.

### **PHAS 610            Clinical Medicine III (3)**

Comprehensive survey course that studies prioritized medical topics within organ systems. The topics covered are the immunologic, musculoskeletal, and neurologic systems and geriatrics. Prerequisites: admittance to the Physician Assistant program and completion of PHAS 609.

**PHAS 612                    Obstetrics/Gynecology (3)**

Prioritized instruction in normal function and selected medical conditions in women's health including pregnancy, childbirth, neoplasm and endocrine changes. Prerequisites: Admittance to the Physician Assistant Program.

**PHAS 614                    Pediatrics (3)**

A survey course that covers growth, development, and diseases from birth through adolescence preparing students for the primary care clinical setting. Prerequisites: Admittance to the Physician Assistant Program.

**PHAS 616                    Surgery (2)**

A survey course that focuses on pre-, peri- and postoperative care, medical considerations of the surgical patient, and prepares the student for the clinical setting. Prerequisites: Admittance to the Physician Assistant Program.

**PHAS 618                    Emergency Medicine (3)**

A Survey course that familiarizes the student with common emergency medicine problems and injuries utilizing a priority system. Prerequisites: Admittance to the Physician Assistant Program.

**PHAS 620                    Infectious Diseases (3)**

A comprehensive survey course on the diagnosis and treatment of infectious diseases seen in primary care medicine and organized by organ system. Prerequisites: Admittance to the Physician Assistant Program.

**PHAS 624                    Issues in Practice (2)**

Topics concerning physician assistant professional practice. Prerequisites: Admittance to the Physician Assistant Program.

**PHAS 625                    Clinical Pharmacology I (3)**

Survey clinical course that emphasizes principles of pharmacology, pharmacokinetics and pharmacotherapy as they relate to drugs in the treatment of common primary care conditions. Prerequisites: Admittance to the Physician Assistant Program.

**PHAS 626                    Clinical Pharmacology II (3)**

A continuation of PHAS 625: Instruction in pharmacology of select drugs, prescription essentials, and general pharmacology resources for the primary care practitioner. Prerequisites: Admittance to the Physician Assistant Program and completion of PHAS 625.

**PHAS 630                    Clinical Procedures I (3)**

Integrated didactic and laboratory course which develops medical, diagnostic, procedural, and therapeutic skills preparing the student for the clinical setting. Prerequisite: Admittance to the Physician Assistant Program.

**PHAS 631                    Clinical Procedures II (3)**

A two module course consisting of Advanced Cardiac Life Support and Pediatric Advanced Life Support. Prerequisite: Admittance to the Physician Assistant Program and completion of PHAS

**PHAS 633                    Scientific Basis of Medicine I (3)**

An in depth review of the normal and abnormal physiologic processes associated with diseases of the cardiac and pulmonary organ systems. Prerequisites: Admittance to the Physician Assistant Program.

**PHAS 634                    Scientific Basis of Medicine II (2)**

An in-depth review of the normal and abnormal physiologic processes associated with diseases of the renal, neurological, and endocrine system. Prerequisites: Admittance to the Physician Assistant Program and completion of PHAS 633

**PHAS 635                    Scientific Basis of Medicine III (2)**

An in-depth review of the normal and abnormal physiologic processes associated with diseases of the gastrointestinal system, immune system, heritable conditions, and spontaneous genetic abnormalities. Prerequisites: Admittance to the Physician Assistant Program and completion of PHAS 634.

**PHAS 640                    Clinical Problem Solving I (3)**

Introduction of clinical diagnostic reasoning utilizing a hypothetical deductive approach. Prerequisites: Admittance to the Physician Assistant Program.

**PHAS 641                    Clinical Problem Solving II (3)**

Approach to clinical diagnostic reasoning through a hypothetical deductive approach. Prerequisites: Admittance to the Physician Assistant Program and completion of PHAS 640.

**PHAS 642                    Clinical Problem Solving III (3)**

Approach to clinical diagnostic reasoning through a hypothetical deductive approach. Prerequisites: Admittance to the Physician Assistant Program and completion of PHAS 641.

**PHAS 645                    Interpreting Research & Literature A-D (1)**

Students will develop the ability to critically analyze current and past medical research and publications, and apply those concepts to the practice of Evidence-Based Medicine through a series of sequentially designed courses and activities. Emphasizes problem formulation, hypothesis testing and data analysis. Completion of a "Capstone Project" is required. The student's advisor will supervise all research undertaken. Prerequisites: Admittance to the Physician Assistant Program.

**PHAS 650                    Diagnostic Tests I (2)**

An introduction to the indications for and interpretation of the chest radiograph and electrocardiogram. Prerequisites: Admittance to the Physician Assistant Program.

**PHAS 651                    Diagnostic Tests II (2)**

Indications for and interpretation of laboratory, pulmonary function, and neurophysiologic testing. Prerequisites: Admittance to the Physician Assistant Program and completion of PHAS 650.

**PHAS 652                    Diagnostic Tests III (2)**

Indications for and interpretation of imaging of the central nervous system, vascular system, abdomen and extremities. Principles of nuclear medicine, magnetic resonance, and computed tomography. Prerequisites: Admittance to the Physician Assistant Program and completion of PHAS 651.

**PHAS 660                    History and Physical Examination I (3)**

Integrated didactic/laboratory course. This course teaches assessment via the medical history with focus on interviewing skill and technique. It prepares students for the clinical setting.

Prerequisites: admission to the Physician Assistant program.

**PHAS 661                    History and Physical Examination II (3)**

Integrated didactic/laboratory series that teaches patient assessment through the complete medical history and physical examination. It prepares students for the clinical setting. Prerequisites: Admittance to the Physician Assistant Program. and completion of PHAS 660.

**PHAS 662                    History and Physical Examination III (4)**

Integrated didactic/laboratory series that teaches patient assessment through the complete medical history and physical examination. It prepares students for the clinical setting. Prerequisites: Admittance to the Physician Assistant Program and completion of PHAS 661.

**PHAS 671                    Preventive Medicine & Epidemiology (3)**

This course introduces the principles of preventive medicine and methods for their incorporation into primary care on an individual, family and community basis. Prerequisites: Admittance to the Physician Assistant Program.

**PHAS 672                    Applied Health Care Ethics & Law for Physician Assistants (3)**

This course enables the student to examine the principles of medical ethics, develop an organized process to resolve clinical dilemmas, and to explore future professional roles.

Prerequisites: Admittance to the Physician Assistant Program.

**PHAS 673                    Psychiatry (3)**

The course includes the identification and management of psychiatric disorders, with an emphasis on the pharmacological management of mood disorders. Prerequisites: Admittance to the Physician Assistant Program.

**PHAS 690                    Clinical Education I (9)**

This course consists of a full-time clinical internship. Prerequisites: Admittance to the Physician Assistant Program and completion of didactic year courses.

**PHAS 691                    Clinical Education II (9)**

This course consists of a full-time clinical internship. Prerequisites: Admittance to the Physician Assistant Program, completion of didactic year courses and completion of PHAS 690.

**PHAS 692                    Clinical Education III (9)**

This course consists of a full-time clinical internship. Admittance to the Physician Assistant Program, completion of didactic year courses and completion of PHAS 691.

**PHAS 697                    Special Topics for Physician Assistants (4)**

This course consists of presentation and examination of special topics in medicine, health, and biosciences. It will also include clinical medicine sub-specialty elective internships. Admittance to the Physician Assistant Program, completion of didactic year courses.

**For more information on this program, please contact:**

Peter M. Stanford, MPH, PA-C  
Chairman and Program Director (Interim)  
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## Department of Rehabilitation

### **Degree Offered**

Master of Science (M.S.), Rehabilitation Counseling

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### **M.S., Rehabilitation Counseling**

The Master of Science in Rehabilitation Counseling (MSRC) is a graduate degree program offered through the Department of Rehabilitation in the School of Pharmacy and Health Professions at the University of Maryland Eastern Shore. Rehabilitation counseling is a thriving professional field and graduates of our program can look forward to employment opportunities in both the public and private sector. Graduates will find numerous opportunities for employment in rehabilitation and a growing number of human services and allied health settings.

### **Objective of the Program**

The mission of the Master of Science program in Rehabilitation Counseling is to train well qualified rehabilitation counselors who are prepared to work with individuals from diverse backgrounds with physical, developmental, psychosocial, and sensory disabilities. A second part of that mission, which is no less important, is to assist our graduates to develop an inclusive and holistic approach to rehabilitation which values the individuals' right to fully participate in the decision making process regarding their development. This approach takes into consideration how all the components of that person's life, (including vocational, psychosocial, spiritual, cultural, and emotional components) may impact their lifestyle and overall quality of life.

### **The Goal**

The goal of the MSRC program is to prepare rehabilitation professionals to effectively assist individuals with disabilities to achieve their highest degree of vocational, psychological, economic and social independence and the greatest quality of life possible. It is essential to our process that students are grounded in the belief that their central role as rehabilitation professionals will be to serve as advocates for individuals with disabilities. As advocates for individuals with disabilities they must recognize and support the reality that rehabilitation is a holistic process which includes addressing the physical, psychological, familial, social, vocational, cultural and spiritual components which influence their lives.

To successfully pursue our mission and goal, it is the objective of the MSRC faculty to expose students to the knowledge, skills, and abilities needed to become highly competent rehabilitation practitioners. The curriculum is designed to introduce students to state of the art knowledge and procedures which carefully integrate theory with substantial experiential components.

The Master of Science degree in Rehabilitation Counseling does address the critical and compelling need for trained rehabilitation professionals in the state of Maryland, the mid-Atlantic region and the nation. The graduate program will not only produce needed

professionals in rehabilitation but will also offset the continuing education needs of regional rehabilitation, human services and allied health personnel

### **Characteristics of the Program**

1. **Educational Objectives:** The graduate program is designed to provide rehabilitation education and training to meet the needs of a diverse and global labor market. The curriculum includes:

- a. job placement counseling of people with disabilities;
- b. infusion of rehabilitation technology across the curriculum; and
- c. preparation of students to work in a variety of allied health and human service professions.

Inclusion of assistive/adaptive and other relevant technology into the curriculum will make a difference in counseling about quality of life for individuals with disabilities.

2. **General Requirements:** The UMES Graduate Program in Rehabilitation Counseling has established a program based on the Council on Rehabilitation Education (CORE) guidelines and State of Maryland professional counselor licensure criteria. Emphasis is placed on competencies that prepare graduates for a career path that includes direct service competencies and administrative functions. The universal CORE-based curriculum prepares graduates to apply to be a certified rehabilitation counselor (CRC) and professional counselor licensure (LPC). Program graduates will be prepared for employment in the State-Federal rehabilitation system, e.g., Maryland Department of Rehabilitation Services, Non-governmental Organizations (NGOs) such as private foundations and associations, and private sector rehabilitation among many venues focused on serving individuals with disabilities and their families. Work settings for graduates of the Rehabilitation Counseling program include federal/state public rehabilitation, private practice, community rehabilitation centers, hospitals, schools, colleges, universities, industry, insurance companies, legal offices, corrections, treatment programs, centers for independent living (CILs), and rehabilitation centers. Additionally, students will be prepared to comply with the federal mandate on Comprehensive System of Personnel Development (CSPD) for the state-federal system of vocational rehabilitation.

The curriculum is consistent with the standards of the Council on Rehabilitation Education (CORE) and the Standards of Practice as set forth by the Commission on Rehabilitation Counselor Certification (CRCC). Graduates following the ascribed curricula are eligible to apply for certification as a Certified Rehabilitation Counselor (CRC). For more information on rehabilitation counseling certification visit the CRCC website: <http://www.crc-commission.org>.

3. **Credit and Courses:** The academic program will require 48 credit hours (16 courses) and can be completed in four semesters by full-time students. Although priority will be given to full-time students, part-time students and non-rehabilitation graduate students may register for courses if space is available. The length of time it will take for a part-time student to fulfill requirements for graduation is contingent upon how many credit hours he/she takes each semester. The course sequence is such that courses are also taken during the Winter and Summer sessions. Students may be required to attend classes during the weekend for some of the clinical courses, including but not limited to RECN 701 and RECN 720. This schedule allows students the opportunity to take only RECN 712 during their final



semester. Students are then afforded the possibility of doing their Rehabilitation Counseling Internship at a location outside of the immediate Princess Anne/Salisbury area. Students must maintain a cumulative grade of B (3.0) in all graduate level courses taken for credit toward a graduate degree.

4. **Comprehensive Examinations:** In addition to completing the CORE-based curriculum, the requirements for the master’s degree in Rehabilitation Counseling will include a final written examination, to be completed in the semester before the student enters the internship. In order to qualify for the comprehensive examination, students should have completed all course requirements excluding the internship. Students must be successful on the comprehensive exam before being allowed to enroll in the internship (RECN 712). Students are responsible for meeting with their advisor before planning to take the comprehensive exams to ensure that all curriculum requirements have been met.

### **Course of Study/Core Requirements (48 Credit Hours)**

*(Note: Credit Hours are given in parentheses)*

#### **First Semester**

<u>Course Number</u>	<u>Course Name</u>	<u>Credits</u>
RECN 621	Disability and Rehabilitation Policy	(3)
RECN 622	Theories and Counseling Techniques	(3)
RECN 623	Cultural and Ethical Dimensions of Counseling	(3)
RECN 642	Techniques of Interviewing and Case Management	(3)

*Total Credits: 12*

#### **Winter Semester**

RECN 640	Psychological Assessments and Measurements	(3)
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*Total Credits: 3*

#### **Second Semester**

RECN 624	Psycho-Social Aspects of Disability	(3)	
RECN 641	Principles and Practice in Career Counseling and Development*	(3)	(3)
RECN 643	Research Methods	(3)	
RECN 720	Advanced Counseling Skills, Techniques & Practices	(3)	

*Total Credits: 12*

#### **Summer Semester**

RECN 701	Group and Family Counseling	(3)
RECN 704	Program Evaluation and Organizational Development	(3)

*Total Credits: 6*

#### **Third Semester**

RECN 625	Medical Aspects of Disabilities	(3)
RECN 705	Counseling Practicum	(3)
RECN 710	Master’s Seminar*	(3)

Total Credits: 9

Fourth Semester

RECN 712

Rehabilitation Counseling Internship\*\*\*

(6)

Total Credits: 6

Total credit hours required: 48

\* Indicates the course requiring 100- documented practical/clinical clock hours.

\*\* Indicates the Internship, 600 clock hours.

RECN 621 through 625 or advisor's consent are prerequisites to other courses. These courses must be completed prior to practical/clinical experiences.

**Practical/Clinical Experience**

The four didactic courses that require practical/clinical experiences are identified below. The Counseling Practicum is a 100 clock hour supervised clinical experience. The Rehabilitation Counseling Internship is a 600 clock hour supervised clinical experience. Details of the requirements for the Internship are written in the syllabi for the clinical courses. All clinical experiences will be supervised by qualified professional personnel, approved and verified by faculty who have Certified Rehabilitation Counseling (CRC) expertise.

Requiring practical/clinical experience within the didactic courses encourages the students to get 15-20 clock hours of immediate practice and application of the theory and knowledge acquired in the lectures from four specific rehabilitation domains.

The four domains below each require 15 - 20 clock hours:

RECN 640	Psychological Assessments and Measurements
RECN 641	Principles and Practice in Career Counseling and Development
RECN 701	Group and Family Counseling
RECN 720	Advanced Counseling Skills and Techniques

The practical/clinical experience competencies for each of the courses are outlined below and are consistent with the Council on Rehabilitation Education (CORE) competencies. Students are expected to express and experience, in these four courses, knowledge consistent with the following competencies.

*RECN 640 Psychological Assessments and Measurements (3)*

- Vocational counseling and consultation services
- Assessment of physical-functional capacities of individuals
- Occupation and labor market information
- Theories of career development/work adjustment
- Computer application and technology
- Assessment and Evaluation
- Interpretation of assessment results
- Test and evaluation techniques for assessment

*RECN 641 Principles and Practice in Career Counseling and Development (3)*

- Vocational counseling and consultation services
- Planning for vocational services
- Vocational implications of various disabilities
- Job placement strategies
- Client job-retention skill development
- Job modification and restructuring techniques
- Job and employer development
- Job follow-up and post-employment services
- Accommodation and rehabilitation engineering
- Supported employment services and strategies
- Services to employer organizations
- Worker's Compensation
- Worker's compensation laws and practices

#### *RECN 701 Group and Family Counseling (3)*

- Individual and Group Counseling
- Individual counseling practices
- Individual counseling theories
- Behavior and personality theory
- Human growth and potential
- Family counseling theories
- Group counseling practices and interventions
- Group counseling theories
- Family, Gender, and Multicultural Issues
- Societal issues, trends, and developments
- Psycho-social and cultural impact on family
- Multicultural counseling issues
- Gender issues
- Family counseling practices

#### *RECN 720 Advanced Counseling Skills and Techniques (3)*

- Individual counseling and counseling theory
- Mental health counseling
- Counseling skills and techniques development
- Gender issues in counseling
- Conflict resolution and negotiation strategies
- Individual, group, and family crisis response
- Termination of counseling relationships
- Individual empowerment and rights
- Boundaries of confidentiality
- Ethics in the counseling relationship
- Counselor Supervision

#### *RECN 705 Counseling Practicum (1-3)*

The Counseling Practicum is exclusively devoted to fulfilling the Council on Rehabilitation Education recommendation for practical experience. This is a 2 semester credit hour, 100 clock hour practical experience under the direct supervision of faculty who have fulfilled requirements to be Certified Rehabilitation Counselors (C.R.C). The practicum shall include on-campus and off campus audio and video taping of individual and group counseling

experiences dealing with rehabilitation counseling concerns which will facilitate the further development of rehabilitation counseling skills. Course requirements, competencies, and the Code of Ethics will be made available in the syllabus for the course.

*RECEN 712 Rehabilitation Counseling Internship (600 CRC-supervised clock hours) (1-9)*

A supervised Rehabilitation Counseling Internship enables the student's socialization into the field of rehabilitation counseling and the development of the appropriate professional skills, experiences and competencies as outlined by the Commission on Rehabilitation Education (CORE) and the Commission on Rehabilitation Counselor Certification (CRCC). The students will gain knowledge that will enhance their ability to help individuals with disabilities find and maintain adequate vocational and personal independence. The internship experience will take place under the supervision of a qualified rehabilitation, rehabilitation related or allied health professional and involve direct experiences with persons with disabilities. Appropriate selected facilities involved in the rehabilitation of individuals who have a physical, mental, developmental, behavioral, or sensory disability will provide an opportunity for students to apply theories and skills. These facilities may include state departments of rehabilitation, centers for independent living, psychiatric hospitals or psychosocial programs, sheltered workshops, supported employment agencies, and institutions or organizations serving individuals with developmental disabilities, substance abusing persons, the industrially injured, agriculturally- or rural-related injuries, aged or adult/juvenile offenders. Students interested in higher education may opt to conduct their internship experience in the Services for Students with Disabilities program at an approved college or university.

*RECEN 720 Advanced Counseling Skills, Techniques, and Practices (3)*

This course is designed to be an advanced course in counseling. The course will examine advanced concepts and practices in current counseling modalities. Students will have the opportunity to participate in guided counseling experiences designed to allow them to refine their counseling skills, knowledge and ability. The course will also provide students will exposure to advanced counseling technology and intervention strategies.

**Didactic Course Descriptions**

*(Note: Credit hours are in parentheses)*

*RECEN 621 Disability and Rehabilitation Policy (3)*

The purpose of this course is to examine, describe and discuss public and private sector policy as it impacts individuals with disabilities (physical and/or mental impairments that effect one or more major life activity). The philosophy of the course and its approach toward policy is presented in the context of systems and a bio-psycho-social approach to human development with the goal of attaining maximum quality of life and community inclusion. Topics include terminology, history, philosophy and legal aspects of rehabilitation and independent living, the state-federal vocational rehabilitation program, benefit systems, workers compensation, employer-based disability management, independent living, disability legislation, and ethical issues.

*RECEN 622 Theories and Counseling Techniques (3)*

This course is a survey and practice course in counseling and psychotherapy. The course covers the theoretical approaches and best practices of counseling with a focus on individuals with disabilities. The underlying assumptions of human nature and personality are covered in addition to the specific techniques associated with each. Students are encouraged to develop their own theory and practice of counseling centered around a thorough reflection on the

individual's belief system, particular target populations they envision working, and individual traits, strengths, and weaknesses. Significant time is spent on experiential activities including dyads, triads, and role-playing. Ethical, legal, multicultural and research issues are also covered in depth.

***REC 623 Cultural and Ethical Dimensions of Counseling (3)***

This course in rehabilitation counseling provides theoretical and practical (clinical) instruction in multicultural and ethical aspects of rehabilitation counseling. Topics include the historical perspectives of multiculturalism and cultural diversity in society, theories and models of identity development among diverse groups, supervisory issues, practical strategies and a review of current research. Ethical issues regarding counseling and direct rehabilitation service delivery are discussed from both a generic and multi-cultural perspective centered upon research-based concepts, specific skills and strategies. Direct role-playing and skill building exercises are employed along with case study methods and lectures. Students are encouraged to develop an awareness of different cultures, learned biases and how they may affect the counseling relationship. Other topics include independence versus interdependence, and specific strategies in rehabilitation counseling. The purpose of this course is to provide students with knowledge and skill that will maximize access and effectiveness in serving underrepresented and culturally diverse populations, and to develop effective outreach strategies.

***REC 624 Psycho-Social Aspects of Disabilities (3)***

The course covers concepts, skills and knowledge of the social and psychological factors that either directly or indirectly effect the quality of life, adjustment and full societal participation of individuals with severe disabilities. Particular focus is placed on coping mechanisms, individual, familial, and cultural attitudes, and strategies that seek to facilitate human dignity, productivity and inclusion. The course will address human growth and potential, attitudinal barriers and vocational implications of disability. Physical disability, mental illness, congenital, developmental and emotional disabilities are addressed. The social and psychological factors that contribute to resiliency and minimize vulnerability are emphasized.

***REC 625 Medical Aspects of Disabilities (3)***

This course involves an exploration of medical information and disabilities from a systems perspective. The course incorporates fundamental medical terminology, medical practitioners, and health care systems. The health care and related systems will be explored in view of their vocational implications, service provision, and resources for intervention, treatment, or therapy for individuals with disabilities. Case studies of systemically related disabilities and how they are managed through the medical model will be explored through the symptomatology, diagnosis, prognosis, and treatment phases of the disabilities. Consumer transition from the medical to the service model will be discussed. The psycho-social and cultural impact of disabilities important to the rehabilitation process will be infused in the curriculum.

***REC 641 Principles and Practice in Career Counseling and Development (3)***

Concepts, principles, and skills related to the employment of individuals with physical, mental and congenital or developmental disabilities will be explored. Current best practices are covered within the context of various models, public and private, that seek to maximize productivity and life-long career pursuits. Areas of emphasis include: the vocational counseling process, marketing approaches and networking strategies for working with employers, placement strategies, theories of vocational development and choice, labor

market surveys and job analysis assessment of work readiness, job seeking and job retention skills, and major occupational classification systems. Knowledge of job modification and restructuring techniques and its importance to the employment of people with disabilities will be covered. Between 15-20 clock hours practica of in vivo supervised vocational counseling are required. Prerequisites: RECN 621; 622; 623; 624; 625

#### *RECN 640 Psychological Assessments and Measurements (3)*

This course will provide the students with basic statistical concepts: a working knowledge of test selection, administration, interpretation of test results and communication of findings in a comprehensive evaluation report. A major emphasis will be on the application of the procedures and utilization of the tools of vocational evaluation including: interviews, work related behavioral observations, individual evaluation plans, vocational counseling, standardized tests, work samples, and situational assessment. Guest speakers and visitations to local evaluation centers may also be utilized to enhance student understanding of the

evaluation process. Between 15-20 clock hours practica of in vivo supervised assessment and vocational evaluation/counseling are required. Prerequisites: RECN 621, 622, 623, 624, 625

#### *RECN 642 Techniques of Interviewing and Case Management (3)*

This is a level survey and practice course covering case management concepts, systems, processes and competencies necessary for the effective delivery of services to individuals with disabilities and their families. The instructional approach seeks to concurrently provide didactic and experiential pedagogy. Various models of case management practice will be presented including the State/Federal system of vocational rehabilitation, workers' compensation systems, health care case management, employer-based disability management, and managed care models. An emphasis is placed on attaining knowledge of the range and level of community and professional resources, services and products that facilitate quality of life, independent living and work for individuals with disabilities in both urban and rural settings. The legal, ethical, cultural, social, and psychological aspects of case management are integrated into the course. The student will attain essential knowledge and skill in the cost-effective coordination of services, vendor selection criteria, negotiation/conflict resolution skills, documentation, and evaluation techniques in providing quality, professional services. Prerequisites: RECN 621, 622, 623, 624, 625

#### *RECN 643 Research Methods (3)*

This course examines research methods and statistical concepts as they apply to the rehabilitation professional. Students will learn about quantitative, qualitative, and single-subject research methods; basic statistical concepts; and the use of the statistical database SPSS. Students will develop critical thinking skills and learn to be good "consumers" of rehabilitation and popular research, as well as learn to collect, manage and analyze data.

#### *RECN 701 Group and Family Counseling (3)*

This course integrates family and group process theory, interventions and practices, and methods into an advanced applied course. The course addresses both clinical and organizational aspects of working with families, groups and organizations in the rehabilitation process. The student is challenged to develop an understanding of group processes that apply concepts, research and best practice models to a variety of settings, client profiles and organizational models. Social psychology, family systems theory, organizational and clinical models are covered in addition to experiential elements that build competencies that are

effective in rehabilitation and healthcare settings. Between 15-20 clock hours practica of in vivo supervised group counseling are required.

*REC N 721 Human Growth and Development: The Life Span (3)*

This course is an introduction to the basic concepts and issues of biological and psychological growth and development from conception through old age. Emphasis is placed on psychomotor, cognitive, and social development through the lifetime. Applied aspects of development psychology will be emphasized in the course.

*REC N 702 Legal Aspects of Rehabilitation (1)*

This course provides an overview of civil rights legislation specific to people with disabilities. The course methods will focus primarily on case studies exploring relevant legislation such as the Americans with Disability Act (ADA), tort and civil law, and their effect on the experience of individuals with disabilities. Students will learn processes and agencies for filing complaints and develop resources on the agencies specific to each element and Title of the ADA. The course will cover public policy, law, and practice, e.g., worker's compensation, and expert testimony. There will also be an emphasis on the organizational structure of private-for profit systems involved in rehabilitation. Additionally, legal issues germane to disability such as commitments, guardianships, and housing law will be discussed. Prerequisites: REC N 621, 622, 623, 624, 625

*REC N 703 High Tech/Low Tech Rehabilitation Systems (3)*

This course will provide an overview of high/low technology focused on adaptive and assistive rehabilitation technology, including aids for daily living. This technology will assist individuals with disabilities to achieve their maximum potential and provide training to students interested in gaining expertise in the use of technology while working with people with disabilities across the human lifespan. The student will become familiar with advanced computer technology such as Enabling Technologies (Braille/print systems), Dragon Dictate (speech input software), adaptive devices for computers, computer technology such as AlphaSmart, IntelliKeys, Delta Talker and a broad array of computer application technology available for working with individuals who are blind, deaf, or physically disabled. Other technology to be taught will include augmentative communication devices, voice output, e.g. outSPOKEN (enable individuals who are blind to access Macintosh). This course will have a practical application of knowledge and didactic preparation for understanding the value and use of advanced technology. Technology for working with people with learning disabilities and a broad range of developmental disabilities will be included. Between 15-20 clock hours practica of in vivo supervised rehabilitation technology are required. Prerequisite: REC N 621

*REC N 704 Program Evaluation & Organizational Development (3)*

This course addresses current best practices in program evaluation. Program evaluations are fundamental to good planning. In order to plan and implement effective, valid and accurate evaluations, an understanding of organizational behavior and developmental concepts are significant. The increasing emphasis upon outcomes and program efficacy, necessitates knowledge and skill in determining return on investment, organizational effectiveness, cost/benefit analysis, research and planning as well as determining whether the needs of a constituency are being met. This course will focus on organizational factors, and evaluation design and technique. Upon successful completion, the student will be able to design, implement, and interpret the results of a basic evaluation strategy and possess a basic understanding of essential organizational behavior and planning processes. These skills are

fundamental to effective and progressive organizational development and service to individuals with disabilities. Prerequisite: RECN 643

*RECN 710 Master's Seminar (3)*

The Master's Seminar will focus on the review of current literature, and will include reading and discussion of specific aspects of rehabilitation. Topics include, but are not limited, to: adaptive/assistive rehabilitation technology, Centers for Independent Living, Supportive Employment, Order of Selection, Ethical Issues, Americans with Disabilities Act, Disability Management, Job Development, Assessment, Cultural Diversity and current legislation on disability issues. The outcomes for this class are an increased interest and proficiency in rehabilitation research, oral and written presentation and publication.

Prerequisites: RECN 621, 622, 623, 624, 625, 641, 640, 642, 643, 701

Courses for Licensure

The following three credit courses will be offered for students and/or professionals interested in pursuing the Maryland State License for Professional Counselors (LPC).

RECN 713 Introduction to Private Sector Rehabilitation

RECN 714 Marriage and Family Counseling

RECN 715 Psychiatric Rehabilitation: Practice, Assessment and Management

RECN 716 Alcohol and Drug Abuse in Counseling

*RECN 713 Introduction to Private Sector Rehabilitation (3)*

This course is designed to explore issues in rehabilitation pertinent to policy, practice, research and legal issues as addressed in the private sector. Topics include the insurance system, worker's compensation, social security testimony, personal injury liability, and expert testimony within these systems.

*RECN 714 Marriage and Family Counseling (3)*

This course is designed to be an introduction course to the topic of marriage and family counseling. The course will examine basic concepts of family counseling and special issues related to couples and families. The course will also examine the theoretical models and procedures appropriate to a variety of theories and specific settings.

*RECN 715 Psychiatric Rehabilitation: Diagnosis and Psychopathology (3)*

This course constitutes a basic orientation to the field of psychiatric rehabilitation. The course will include historical antecedents, philosophical and traditional connections with the field of rehabilitation counseling, assessment, planning and service delivery methods for those intending to work in rehabilitation focused programs serving persons with psychiatric disabilities. This course will also examine the incidence of etiology of significant dysfunctional behavior patterns in individuals.

*RECN 716 Alcohol and Drug Abuse in Counseling (3)*

This course is designed to provide an overview of alcohol and drug use, misuse and abuse. Course content includes: historical perspective of drug use/abuse; psychosocial aspects; pharmacology; prevention strategies; drug education; treatment and rehabilitation; examination of personal alcohol and drug use practices and philosophies; and current issues.

**Admission Criteria**



1. The application form and required attachments (see *Application Instructions* (Pg. 25) in this Catalog), including the Graduate Record Examination (GRE) General Test or Miller Analogies Test (MAT) scores which may be submitted as optional support.
2. A Bachelor's Degree with a minimum 3.0 cumulative GPA on a 4-point scale is required for regular admission. Provisional admission will be considered for students with a GPA of 2.75 to 2.99 as long as all other requirements have been fulfilled.
3. A personal interview.
4. By accepting admission into the Master of Science in Rehabilitation Counseling program, the applicant agrees to:
  - a. complete pre-requisites in the time frame given;
  - b. maintain a 3.0 cumulative GPA over all coursework;
  - c. practice professional conduct in accordance with UMES policies, CRC Code of Ethics, and local and state laws.

Failure to maintain a 3.0 cumulative GPA will result in a probationary period or termination as determined by the Department of Rehabilitation Graduate Committee and Graduate School policy.

Denial of admission may be made for reasons, which will be outlined for potential future amelioration. Acceptance is based on the listed criteria above and the availability of limited space. These criteria are designed to establish high standards of service and instruction consistent with accreditation recommendations.

#### **Prerequisite Undergraduate Coursework**

1. An introductory course is needed in Human Services, such as the UMES course REHA 201 - Introduction to Rehabilitation, or Introduction to Psychology, Abnormal Psychology, Developmental Psychology, and/or Introduction to Sociology.
2. A basic statistics course is needed.
3. Comparable undergraduate courses will be reviewed for equivalencies.

#### **Application Deadlines**

Fall Semester        – March 1  
 Spring Semester    – November 1

#### **Retention-Dismissal – Reinstatement/Readmission Policy**

1. A cumulative GPA. of 3.0 each semester is required.
2. A maximum of two (2) grades of 'C' in a semester or session results in academic probation. Students have two consecutive semesters in which to raise their cumulative GPA to 3.0, or be subject to academic dismissal.
3. A grade of 'D' or 'F' is subject to academic probation and/or dismissal from the program. Readmission or reinstatement is provisional and contingent upon repeat of the class with grade of 'A' or 'B'.

4. A request to repeat a course because of a deficient grade earned is provisional and must be a written petition submitted to the Department Chair with the signature and recommendation of the advisor.
5. Readmission or reinstatement is at the discretion of the Department of Rehabilitation Graduate Committee.
6. A successful completion of an internship is required.

**Transfer and Waiver Courses**

Students have up to a 6 credit hour limitation for transfer of equivalent courses, unless those courses were completed with a cumulative GPA of 3.0 in a comparable CORE accredited program. Evaluation and approval of graduate transfer courses will be up to the Department of Rehabilitation Graduate Committee.

Additionally, students completing the undergraduate program in the Rehabilitation Services with a cumulative GPA minimum of 3.0 can elect to request exemption from up to 6 credit hours of rehabilitation comparable core courses where they have earned a grade of 'A' in the undergraduate course. See advisor for the courses where waiver(s) are allowable. The credit hour substitutions need to be program/career related and approved by the Academic Advisor.

**For more information on this program, please contact:**

LaKeisha Harris, Ph.D.  
Graduate Program Coordinator  
Department of Rehabilitation  
Hazel Hall, Room 1110  
University of Maryland Eastern Shore  
Princess Anne, MD 21853  
Phone: 410 651 6262  
Email: [lharris@umes.edu](mailto:lharris@umes.edu)

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# SCHOOL OF PHARMACY

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<http://www.umes.edu/pharmacy>

## **Degree Offered**

Master of Science (M.S.) in Pharmaceutical Science

Doctor of Philosophy (Ph.D.) in Pharmaceutical Sciences

Doctor of Pharmacy (Pharm.D.)

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## **M.S., Ph.D., Pharmaceutical Sciences**

### **General Information and Program Overview**

The Pharmaceutical Sciences Graduate Program (PSGP) is a research-oriented degree program that offers multidisciplinary training in the areas of Drug Design & Discovery (DDD) and Drug Delivery & Clinical Pharmacology (DDCP). Students who fulfill the academic criteria of course work and original research culminating in a thesis or dissertation will earn the Master of Science (M.S.) or Doctor of Philosophy (Ph.D.) degree, respectively.

The two areas of specialization, DDD and DDCP, were created to develop a curriculum that is interdisciplinary and at the cutting edge of the ever-advancing field of pharmaceutical sciences, thus providing a state-of-the-art educational experience for the student. The graduate program in Pharmaceutical Sciences prepares students for careers in academia, government and advanced scientific research in the pharmaceutical and biotechnology industries.

The DDD track offers students the ability to gain knowledge and conduct research in the areas of drug design and synthesis, biosynthesis of natural products, neuropharmacology and immunology. The DDCP track offers the students the ability to gain knowledge and conduct research in the area of drug delivery systems with a focus on the use of nanotechnology in targeted drug delivery. The DDCP track also offers the opportunity for students to train in clinical pharmacology by acquiring advanced pharmacokinetic and pharmacodynamic analysis skills and through the use of modeling and simulation techniques.

Please consult the Pharmaceutical Sciences website for additional information, details of the Graduate Program that are not covered here and for updates. ([www.umes.edu/PharmSci](http://www.umes.edu/PharmSci))

### **Objectives of the Program**

The goals of the PSGP are:

- 1) To provide the best training for students interested in pursuing careers in biopharmaceutical drug development; to conduct high-quality research relevant to pharmaceutical and biotechnology industries; to offer innovative educational programs; and to support the biopharmaceutical industry, especially in Maryland.
- 2) For students to attain a high level of scholarship, research and leadership skills that contribute to the pharmaceutical sciences; for students to engage in the conduct of original research focusing on contemporary issues facing the pharmaceutical industry; to provide students with training at the highest level in life sciences pertaining to pharmaceutical sciences; and to prepare students for professional careers in academia and advanced scientific research in the pharmaceutical and biotechnology industries.

## Participating Faculty

- Physiology/Pharmacology
  - [Miguel Martin-Caraballo](#), Ph.D., Associate Professor
  - Mark A. Simmons, Ph.D., Professor
  - [T. Sean Vasaitis](#), Ph.D., Assistant Professor
- Medicinal Chemistry
  - [Patrice L. Jackson-Ayotunde](#), Ph.D., Associate Professor
  - [Madan K. Kharel](#), Ph.D., Assistant Professor
  - [Fred R. Tejada](#), Ph.D., Associate Professor
- Molecular Genetics/ Microbiology
  - Victor Hsia, Ph.D., Associate Professor
  - Bi-Dar (Peter) Wang, Ph.D., Assistant Professor
- Pharmaceuticals
  - Adel Karara, Ph.D., Associate Professor
  - [Anjan Nan](#), Ph.D., Assistant Professor

## Admission

Students will be required to have the equivalent of a bachelor's degree in the biological, chemical, or pharmaceutical sciences, or in a related field. Students are expected to have completed university courses in the following areas:

1. biochemistry or cell and molecular biology;
2. organic chemistry;
3. calculus.

Additional advanced coursework in biology, chemistry or pharmaceutical science is expected. Specific requirements include a minimum cumulative GPA of 3.0, a combined verbal and quantitative GRE score of 151 verbal, 153 quantitative, and 4.0 for analytical writing, and a minimum internet-based TOEFL score of 80. Applicants to the PSGP will be considered at the M.S. and Ph.D. levels. For applicants to the Ph.D. track with a bachelor's degree, admission may initially be to the M.S. track with final acceptance to the Ph.D. track contingent on successful completion of a probationary period (usually one year) and on the recommendation of the student's Research Advisory Committee (RAC).

Applications will be evaluated by the Admissions Committee of the PSGP based on the following criteria:

1. Applicant's research interests must be clearly stated and relevant to one or more of the PSGP faculty.
2. The academic preparation of the applicant must be consonant with stated interests and admissions requirements.
3. The undergraduate cumulative GPA and GPA in science courses. Students with a GPA below 3.0 may be provisionally accepted on the basis of related research or workexperience.
4. Prior research experience will be favorably considered, although not required.
5. Applicants must submit the following documents as part of their application forgraduate study in the PSGP.
  - a. GRE Scores (Only the General Test is required, although one of the Advanced Tests is strongly recommended).
  - b. Official college transcripts.
  - c. A brief essay clearly defining areas of research interest within PSGP. The essay will assist with identification of an Academic Advisor should the applicant be admitted to the program.

d. Three letters of recommendation from persons familiar with the academic/research work of the applicant.

The Admissions Committee will perform the initial screening of the applicant's credentials. Students missing prerequisite courses may be offered provisional admission. Upon entry into the PSGP, the academic record of the entering students will be analyzed, and appropriate supplementary courses will be suggested in order to ensure the academic success of the students enrolled in the program. Receipt of the application will initiate the search for an appropriate faculty member to serve as the Academic Advisor for the student. All students admitted to the PSGP will have an assigned Advisor. If an applicant has had discussions with a member of the faculty about serving as an Advisor, that fact should be stated in the application. The faculty member should forward a letter of agreement to the Dean of the Graduate School with a copy to the PSGP Admission Committee.

### **Application Deadline**

Fall Semester – March 1

### **Advisors and Research Advisory Committees**

Upon admission to the PSGP, students will be assigned to an Academic Advisor. Any request for a change of Advisor must be submitted to and approved by the PSGP Director. In certain situations, a student may request a second Academic Advisor. This might happen if, for instance, the professor most familiar with the student has only Associate Graduate Faculty status. In this case, it is possible to set up a co-advisor team of two professors to jointly serve in the role of Advisor (the other having Regular Graduate Faculty status). Due to the expected divergent interest and goals of students in the PSGP, the early formation of a Research Advisory Committee (RAC) is mandatory. During the first semester of enrollment in the PSGP, the student and the Advisor must form this Committee and submit its membership to the PSGP Director for approval. The RAC should meet during the first semester, and must make its written recommendations for a program of study before the end of the second semester.

A Master's RAC will consist of three members, all of whom must be Regular or Associate members of a University System of Maryland (USM) campus Graduate Faculty. A Ph.D. RAC must have at least five members, three of whom must be Regular or Associate faculty. The Ph.D. RAC can consist of a minimum of three members who are USM graduate faculty until the Comprehensive Examinations, at which time it must consist of five or more members. The student's Advisor will serve as Chair of this Committee. The membership of the RAC should not be drawn entirely from a single laboratory or department. Replacement of Committee members is expected, as needed, based on the Advisor's recommendation.

The program of study will be planned by the RAC in the first semester and will include missing prerequisites (all prerequisites must be completed within the first year in the program), core courses, and elective courses, as recommended by the Committee. It is likely that the total credits required by the RAC may exceed the general credit minimum (30 for M.S. and 23 for Ph.D.). Following the RAC's recommendation, the program of study must then be approved by the PSGP Director.

The RAC is also responsible for initial approval of the student's area of research. Once the student has chosen an area of research, a proposal should be written and disseminated to the RAC. This preliminary research proposal should be brief, yet concisely state the student's research interests. Students in the Ph.D. track will later develop a more comprehensive research proposal which they must defend before advancing to candidacy. Students in the M.S. track will develop a more complete thesis proposal to submit to their RAC as described

below. The approved preliminary proposal should be filed with the PSGP Director by the end of the second semester following entry into the PSGP. A M.S. student's RAC will approve the thesis proposal and the thesis defense. Master's thesis students are not required to take comprehensive examinations. For Ph.D. students, the RAC will administer the defense of the dissertation proposal, oversee the student's research, and administer the dissertation defense.

Annual progress reviews initiated by the Advisor will be conducted through the RAC and the Director to ensure satisfactory progress of students toward degree completion (coursework and research direction). The RAC is responsible for tracking the progress of students throughout their graduate career.

### **Pharmaceutical Sciences Graduate Program Time Limits**

- Full time Master's students will be limited to four (4) years in which to graduate.
- Full time Doctoral students will be limited to seven (7) years in which to graduate. Students must be advanced to candidacy, i.e., have taken and passed the written and oral comprehensive examination and the dissertation proposal defense within 6 semesters after initial enrollment.
- Part-time Doctoral and Master's students will follow the Graduate School's time limits for Master's degrees (5 years) and Doctoral degrees (5 + 4).
- An extension of these time limits may be granted upon request of the student's RAC, and with the approval of the PSGP Director and the UMES Dean of Graduate Studies.

### **Grading Policy for the Pharmaceutical Sciences Graduate Program**

Students are allowed no more than two grades of "C" in all courses taken as part of the PSGP. After receiving a second "C", the student will receive a probationary letter. If a student receives three "C's" the student will be dismissed from the program. A grade of "D" or lower is unacceptable. Any student who receives a grade of "D" or lower will be dismissed from the program.

### **Degree Requirements for the Pharmaceutical Sciences Graduate Program**

M.S. students are required to complete a minimum of 22 hours of course work and 8 hours of thesis credits for a total of 30 hours. The Ph.D. requires a minimum of 23 credits beyond the M.S. level (or 53 credits minimum beyond the baccalaureate degree), with at least 19 credits of course work and 4 credits of dissertation research; those entering the Ph.D. program with only a Bachelor's degree will need additional coursework to meet the 53 credits minimum.

#### *Recommended Coursework for M.S. (with thesis)*

*(Note: Credit hours given in parentheses)*

#### 30 credits total

PSGP 801 Drug Design and Discovery I (3)

PSGP 803 Advanced Drug Metabolism I (3)

PSGP 725 Advanced Instrumental Analysis (3) or equivalent

PSGP 601 Responsible conduct of research: research ethics (1)

PSGP 709 Seminar, Journal Club (4)

PSGP 799 Research/M.S. Thesis (8)

Electives (8)

#### *Recommended Coursework for Ph.D.*

*(Note: Credit hours given in parentheses)*

### 23 credits beyond the M.S.

PSGP 805 Dosage forms and Advanced Drug Delivery Systems (3)

PSGP 809 Seminar, Journal Club (1)

PSGP 810 Grant proposal, Scientific writing, Academic Development (3)

CSDP 604 Computer methods in statistics (3) or equivalent

PSGP 899 Research/Dissertation (4)

Electives (9)

### **Elective Courses**

PSGP 602 Oral Solid Dosage Forms (3)

PSGP 802 Advanced Drug Design and Discovery II (3)

PSGP 804 Advanced Drug Metabolism II (3)

PSGP 811 Principles of Pharmacology (3)

PSGP 812 Advanced Bioorganic Chemistry I (3)

PSGP 813 Advanced Bioorganic Chemistry II (3)

PSGP 814 Advanced Neuropharmacology (3)

PSGP 815 Clinical Chemistry (3)

PSGP 816 Advanced Molecular Pharmacology (3)

PSGP 817 Advanced Immunology (3)

PSGP 818 Advanced Pharmacokinetics & Pharmacodynamics (3)

PSGP 819 Modeling and Simulation Methods in Quantitative Clinical Pharmacology (3)

PSGP 820 Translational Nanomedicine (3)

AGRI 684 Recombinant DNA Technology (3)

AGSC 605 Statistics in Agriculture Research (3)

ANPT 622 Analytical Laboratory Methods (2)

BCHM 671 Protein Chemistry and Enzymatic Cat. (3)

CHEM 632 Advanced Organic Chemistry (3)

CHEM 670 Advanced Biochemistry I (3)

CHEM 710 Polymer Chemistry (3)

TOXI 601 Advanced Toxicology I (3)

TOXI 602 Advanced Toxicology II (3)

TOXI 688D Molecular Genetics and DNA Damage (3)

TOXI 688G Advanced Molecular Toxicology (3)

Students in the graduate program may enroll in up to 6 credit hours of Pharm.D. 500/600 level classes as electives. These Pharm.D. classes will have additional requirements for the enrolled graduate students as designated by the course instructor. Graduate students in the PSGP who are Pharm.D. graduates may not take courses in the Pharm.D. program with the exception of elective classes approved by the Academic Advisor.

### **M.S. Thesis Defense**

An oral defense of the thesis, administered according to Graduate School procedures, will take place at the completion of the research project. This defense will be conducted by the RAC and will be administered once all other degree requirements have been fulfilled. The RAC also approves the thesis. It is the candidate's obligation to see that each member of the Committee has at least *two weeks* in which to examine a copy of the thesis prior to the time of the defense. After the defense presentation, the RAC will decide whether the candidate has passed or failed. A student may be conditionally passed with the provision that minor changes in the thesis be made by the student and approved by the major Advisor. A student who fails may, at the discretion of the RAC and the UMES Graduate Studies Dean, be permitted to stand for a second defense after acting on suggestions for improvement of the thesis (e.g., collection of more data, use of different statistical analysis, rewriting of the discussion, etc.),

at such time as the Advisor considers appropriate. Once the thesis has been successfully defended, the copies required by the Graduate School must be submitted.

### **Examinations for Candidacy**

Formal application for advancement to candidacy for the Doctoral degree requires successful completion of both a written comprehensive examination and an oral defense of the dissertation proposal. The written comprehensive examination must be passed before the student can defend the dissertation proposal.

#### *a. Comprehensive Examination*

The comprehensive exam must be taken by the end of the student's fifth semester. This examination is intended to determine whether the student demonstrates sufficient evidence of scholastic and intellectual ability in the major and related academic areas. Students will not be allowed to take this exam until they have completed all of the didactic course requirements of the program with a GPA of 3.0 or better. The examination will not be a defense of the research proposal. The RAC is responsible for administering the written comprehensive examination. This examination must be successfully completed before the dissertation proposal can be defended. The RAC will determine whether the student passes (a minimum of four affirmative votes is required), or fails. If failed, the examination may, at the recommendation of the RAC, be taken again. In this case, the examination should the examination is failed a second time, admission will be cancelled. Any conditional passing of the examination must be satisfied before the examination can be rendered successfully completed.

#### *b. Dissertation Proposal Defense*

The proposal defense is an oral examination on the research proposal administered by the RAC. At least two weeks prior to the examination, the student must supply the Committee members with a formal research proposal in a PDF file following the guidelines and page limits of a NIH R01 grant proposal, PHS 398 Research Plan Form. The RAC will examine the student on all aspects of the proposed research to determine whether the research plan is sound, whether the student has the proper motivation, intellectual capacity and curiosity, and has, or can develop, the technical skills necessary to successfully pursue the Ph.D. degree. The student passes if there are at least four affirmative votes. If failed, the student must re-defend the proposal within one year; a second failure will result in cancellation of admission.

The research proposal should be defended within one year of unconditionally passing the written comprehensive examination and at least one year before projected completion of the degree requirements.

At the successful completion of this defense, the student officially applies for *Advancement to Candidacy for the Ph.D. Degree* and should submit the necessary form to the UMES Graduate School. Students must be admitted to candidacy at least six months prior to the defense of the dissertation (final oral defense).

### **Ph. D. Dissertation Seminar & Dissertation Defense**

A candidate for the Ph.D. degree will present a public seminar on his/her dissertation research. The seminar should, under normal circumstances, be given within five weeks in advance of the day of the oral final examination. The student and the Advisor will be responsible for initiating arrangements for the date and advertisement of the seminar. The seminar will be open to faculty, students, and other interested parties.



The final oral defense of the dissertation will be conducted according to the “Procedures for the Oral Defense” in the UMES Graduate Catalog.

### **Teaching**

In order to promote development as teacher-scholars, all students enrolled in the PSGP will be required to teach during two semesters. *Teaching is required regardless of the source of stipend support.* First year students will not teach. In the second year, all students must serve as a teaching assistant in a designated course. Additional teaching, not exceeding one course per year, is encouraged.

### **Core Courses Description**

#### *PSGP 801 Drug Design and Discovery I (3)*

In depth consideration and correlation of molecular structure to biological activity of organic medicinal agents, the synthesis, chemical and pharmacological properties, current theories and their application to medicinal chemistry.

#### *PSGP 803 Advanced Drug Metabolism I (3)*

A study of the metabolism and disposition of drugs and drug metabolites. Topics include in-depth discussions of Phase I and II biotransformation pathways, pharmacogenetics, biotransformation and toxicity, in vitro/in vivo techniques for evaluating drug metabolism and scale-up of drug metabolism data.

#### *PSGP 805 Dosage Forms and Advanced Drug Delivery Systems (3)*

This course is designed to study the various dosage forms and drug delivery systems. Emphasis will be placed on novel dosage forms and drug delivery systems.

#### *PSGP 725 Advanced Instrumental Analysis (3)*

This course is designed to provide the student with an advanced knowledge in modern analytical chemistry and instrumental methods of analysis. Application will be on the use in the pharmaceutical sciences. Emphasis will be on chromatographic techniques, NMR, IR and Mass Spectroscopy.

#### *PSGP 709 Seminar/Journal Club (1)*

Presentations, reading and discussions on the pharmaceutical sciences.

#### *PSGP 809 Seminar/Journal Club (1)*

Presentations, reading and discussions on the pharmaceutical sciences.

#### *PSGP 810 Grant proposal, Scientific Writing and Academic Development (3)*

A course designed to detail the processes involved in writing a proposal in the area of specialization. This course will also include a critical review of published manuscripts and those submitted for publication.

#### *PSGP 601 Responsible conduct of research (RCR): Research Ethics (1)*

All graduate students in the Pharmaceutical Sciences Program are required to satisfy the RCR requirement. The Responsible Conduct of Research (RCR) course is intended to provide students with information on pertinent federal and University guidelines and regulations pertaining to the responsible conduct of research as well as to instruct them in a method of utilizing moral reasoning skills in responding to ethical dilemmas in research.

### *CSDP 604 Computer methods in statistics (3)*

Topics include (not limited to); principles and applications of probability and statistics needed in graduate studies in various academic areas and to the computer realization of these methods. Review of basic statistical principles. Pre-requisite: one semester of calculus.

### *PSPG 821 Clinical Pharmacology and Drug Development (3)*

This course will focus on the early clinical drug development including the rationale and study design of studies needed for the clinical pharmacology section of new drug applications. Lectures will involve the challenges regarding discovery research, development, formulations and manufacturing and regulatory issues in the creation of new products for patient care. The course will require students to assimilate the information from pharmaceuticals, pharmacokinetics, pharmacology and pharmacotherapy and be able to write out and verbally present on drug development issues. The class will be an interactive format with student questions / discussion being fostered in class, along with student product presentation by each student.

### *PSGP 799 Research/M.S. Thesis Writing (1-9)*

Research under faculty supervision in an area of specialization leading to the preparation and submission of a Thesis in partial fulfillment of the graduation requirements.

### *PSGP 899 Research/Ph.D. Dissertation Writing (1-9)*

Research under faculty supervision in an area of specialization leading to the preparation and submission of a Dissertation in partial fulfillment of the graduation requirements.

## **Elective Courses Description**

### *PSGP 802 Drug Discovery II (3)*

A continuation of Drug Discovery I.

### *PSGP 804 Advanced Drug Metabolism II (3)*

A continuation of Advanced Drug Metabolism I.

### *PSGP 811 Principles of Pharmacology (3)*

General principles of pharmacology including metabolism, action, interactions, side effects, toxicity and therapeutic use of drugs.

### *PSGP 812 Advanced Bioorganic Chemistry I (3)*

This course covers the biosynthesis of different classes of natural products drugs/drug candidates. The course begins with the introduction of organic reaction mechanisms relevant to the natural products biosynthesis. The biochemistry of carbohydrate and fat metabolism that provide building blocks for the biosynthesis of majority of classes of natural products are covered. Biosynthesis of selected classes of pharmaceutically important natural products-aminoglycosides, deoxysugars, and peptides (both ribosomal and non-ribosomal)-will be covered. Currently used drugs pertaining to these classes will be introduced.

### *PSGP 813 Advanced Bioorganic Chemistry II (3)*

This course is built on the platform of the Advanced Bioorganic Chemistry I. Biosyntheses of polyketide drugs, recent advances on engineering of secondary metabolite pathways; shikimate pathway, shikimate-derived metabolites (cinnamic acids, lignans, benzoic acids, flavonoids, and aromatic amino acids) and alkaloids are covered. Mevalonate pathway, biosynthesis of terpenes, cyclization mediated structure diversification of terpenes, terpenes

therapeutics, and natural product drugs of mixed biosynthetic origin are extensively covered in this course.

*PSGP 814– Advanced Neuropharmacology (3)*

Advanced study of the central nervous system pharmacology and neurochemistry. Topics will include the actions of neurotransmitters in the central nervous system and the use of drugs which exert therapeutic action in the central nervous system.

*PSGP 815 Clinical Chemistry (3)*

Clinical chemistry is an area of clinical pathology that uses chemical tests for various components in blood and urine for diagnostic, prevention, and prognostic information, and therapeutic purposes. This course provides an overview of various tests used in medical diagnostics and discusses the interpretations and limitations of the tests. The topic that will be covered include electrolytes, acid-base disorder, kidney and liver function tests, enzymes and proteins, hemoglobinopathy and iron metabolism, endocrine (diabetes, bone markers, hypothalamus, pituitary, thyroid, adrenal, gonads, and pregnancy), cardiac disease and lipid disorders, therapeutic drug monitoring, alcohol, and clinical toxicology.

*PSGP 816 Advanced Molecular Pharmacology (3)*

Study of the actions of drugs at the molecular level.

*PSGP 817 Advanced Immunology (3)*

This course will discuss the current progress of areas related to immunology including tumor immunity, virus immunity, or auto-immune diseases. Each year will focus on one of these three topics. Contents include lectures by faculty, seminar by invited speakers, and article presentation by students.

*PSGP 818 Advanced Pharmacokinetics and Pharmacodynamics (3)*

This course is designed to provide the student with the advance knowledge and skills necessary for problem solving technique related to the relationship between plasma concentration and effect, and clearance concepts as it relates to drug therapy. Emphasis will be placed upon a complete understanding of advanced, clinically applicable pharmacokinetic formulas and the assumptions that are involved with their use. This course will also utilize computer simulation programs to fit pharmacokinetic/pharmacodynamic parameters using different models. Prerequisites: PHAR 530 and PHAR 531 or equivalent.

*PSPG 819 Modeling and Simulation Methods in Quantitative Clinical Pharmacology (3)*

Quantitative methods are an essential part of clinical pharmacology, both in the pharmaceutical industry and academic/government settings. This course is designed to give the student hands-on experience in applying quantitative methods to problems in clinical pharmacology and drug development. The first few weeks will be a refresher in the use of the standard software used in pharmacometrics (NONMEM, R, and Madonna). The students will be given weekly problems (derived from actual drug development work in the pharmaceutical industry) where quantitative methods must be used to answer specific questions around drug dosing, formulation development, first-time-in man dose finding, study design, and clinical trials simulation. The student will then be asked to present their solutions to the rest of the class. (Prerequisites – 1 year statistics, basic familiarity with NONMEM and R).

*PSGP 820 – Translational Nanomedicine (3)*

Design considerations and applications of novel engineered nanomedicine in drug delivery and imaging will be discussed. The course will cover basic concepts in nanomedicine, physicochemical characterization techniques for engineered nanomaterials, applications of

nanomedicine in diagnostics and therapy, translational aspects and safety and regulatory considerations. Students will assigned group activities to review contemporary research articles on nanobiotechnology applications and present their findings to the rest of the class. *Prerequisite: PSGP 801, PSGP 805 and also basic understanding of physical chemistry; organic chemistry and biochemistry.*

#### *PSGP 602 Oral Solid Dosage Forms (3)*

This course will focus on the process, equipment and technology associated with unit operation required for the manufacturing and packaging of tablets and capsules. The course will cover basic concepts of ingredient dispensing/formulation; blending; granulation; drying; compression/encapsulation; coating and packaging. The course will describe the oral solid dosage forms processing methods including direct compression, wet and dry granulation. Process monitoring/validation techniques will be discussed with an emphasis on scale-up and technology transfer.

#### *CHEM 632 Advanced Organic Chemistry (3)*

This course is a continuation of CHEM 211/211H and CHEM 212/212H. This course is built from three learning modules: advanced organic reactions (controlled radical processes, carbon-carbon bond formation, pericyclic reactions); advanced NMR analysis of organic molecules (one and two dimensional NMR methods, DEPT, COSY, HetCorr and others); reaction involving organometallic reagents (organometallic complexes and their structure, 18 electron rule, oxidative addition and reductive elimination, C-H bond activation and others).

#### *CHEM 670 Advanced Biochemistry I (3)*

The course covers the classification, chemistry, and metabolism of proteins, amino acids, carbohydrates, and lipids. Prerequisites: One semester of Biochemistry.

#### *BCHM 671 Protein Chemistry and Enzymatic Catalysis (3)*

The course involves the study of the structures and functions of proteins. Emphasis will be placed on the application of the structure-function relationships to the development of experimental protocols for studies in biochemical research.

#### *CHEM 710 Polymer Chemistry: Environmental and Biomedical Aspects (3)*

Synthetic polymers have become an integral part of our lives and can be found in many everyday and advanced materials: rubber tires, bullet-proof vests, paints, fibers, contact lenses, drug delivery vehicles and many others. This course will cover the basics of polymer synthesis, including traditional polymerization techniques, such as free-radical and anionic chain polymerizations, and step-growth polymerization. Newer methods of polymer synthesis, such as ring-opening metathesis polymerization and living free-radical polymerizations will also be discussed. Fundamentals of structure and physical properties of polymers and methods of characterization will also be covered. For each type of polymers, the influence of toxic additives and impurities on environment will be discussed. In addition, such important topics as ecological aspects of polymer waste management, accidental and controlled polymer burning; fire retardants, replacing toxic plastics by similar nontoxic ones, biodegradable and biocompatible polymers will be discussed. The course is theoretical and meets two times per week for two academic hours lectures/discussions. **The recommended text book is: Odian, Principles of Polymerization, Wiley, 4th ed., 2004.** The course is Blackboard supported. The course is built in such a way that each common theoretical polymer topic is followed by the topic covering the environmental and/or biomedical aspect related to this theoretical topic. You are required to attend all lecture and discussion classes. **Pre-Requisites:** CHEM 211, CHEM 213, CHEM 212, CHEM 214

### *TOXI 601 & 602 Toxicology (3 + 3)*

A two-semester course covering basic principles of toxicology and mechanisms by which chemicals cause diseases and environmental damage. Topics include target organ toxicity, major classes of toxic agents, and mechanisms of cell injury and cell death. The course is offered in sequence in fall and spring semesters.

### *TOXI 688G (3)*

This course will provide areas of toxicology where significant advances are being made on molecular mechanisms. Emphasis on alterations in function caused by toxic substances, and by genetic and metabolic diseases. The course will focus on new advances in biochemical and molecular biological experimental techniques that would help understand the precise effects of xenobiotics on living organisms at the molecular, cellular, and organismal levels. Emphasis on linking molecular pathways to more general biomedical context.

### *TOXI 688D (3)*

The course provide an understanding of the basic genetic mechanisms that govern gene expression, understanding of the basic genetic mechanisms that govern transmission of genetic information and cell cycle control mechanisms that determine the timing of cell division as well as the analysis of how environmental factors alter normal genetic pathways.

### *AGSC 605 Statistics in Agricultural Research (3)*

Emphasis is placed on techniques and application of statistical and experimental design, data acquisition, analysis, interpretation and presentation as applied to Agricultural Sciences.

### *ANPT 622 Analytical Laboratory Methods (2)*

The application of analytical laboratory techniques used in biomedical research will be explored.

### *AGRI 684 Recombinant DNA Technology (3)*

This is a laboratory course to introduce the basic principles of gene cloning, give essential background on working with *E. coli*, utilize different cloning systems and employ methods utilized for DNA sequencing.

### *External Support of Research Activities*

Funding of PSGP students will be through private (student loans) and government agencies (graduate scholarships). UMES faculty have received funding for research from a number of federal and state agencies and private organizations including: National Science Foundation, National Institutes of Health, US Department of Agriculture, National Oceanic and Atmospheric Administration, US Department of the Interior, Environmental Protection Agency, Mid-Atlantic Fisheries Development Foundation, National Aeronautics and Space Administration, US Forest Service, Agency for International Development and the Maryland Department of Natural Resources.

### **For additional information on the PSGP please contact**

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## Pharm.D., Doctor of Pharmacy

### **Mission**

The University of Maryland Eastern Shore (UMES) School of Pharmacy is dedicated to developing exemplary pharmacy professionals and scholars who are committed to patient-centered care, lifelong learning, discovery, and service for diverse communities of the Delmarva Peninsula, the State of Maryland, and around the world.

### **Vision**

We are leaders in the health care community devoted to delivering patient-centered care, fostering pharmacy research, and enhancing the quality of life for all people through the development of accomplished, collegial, and caring pharmacy professionals.

### **Values**

We will meet our mission and vision by cultivating collaboration, compassion, cultural proficiency, ethical behavior, and innovation with integrity and respect.

### **Three-year Program**

The program offers small class sizes and seeks to provide students with a strong foundation in the pharmaceutical, social/administrative, and clinical sciences. The UMES program is a year-round curriculum, allowing students to complete their Doctor of Pharmacy (Pharm.D.) degree in three years. It is the only three-year concentrated Doctor of Pharmacy Program in the state of Maryland.

### **Accreditation**

The Doctor of Pharmacy program of the University of Maryland Eastern Shore, School of Pharmacy was awarded full accreditation on June 26, 2013 by the ACPE Board of Directors. The Doctor of Pharmacy program is not subject to the regulations of the UMES Graduate School.

For more information on the ACPE accreditation process, consult the Office of the Dean at 410-651-8327 or the Accreditation Council for Pharmacy Education 20 North Clark Street, Suite 2500, Chicago, IL 60602-5109. Phone: 312/644-3575; Fax: 312/664-4652; website [www.acpe-accredit.org](http://www.acpe-accredit.org).

### **Admissions Requirements**

#### *Physical Examination and Immunization Requirements*

Each student admitted to the Doctor of Pharmacy program is required to have a physical examination at his/her own expense. The results of the physical examination must be signed by a licensed physician and placed on file in the Charles R. Drew Student Health Center, no later than 30 days prior to matriculation. Please print and complete the UMES SOP Health and Immunization History Form by visiting this website:

[www.umes.edu/WorkArea/linkit.aspx?LinkIdentifier=id&ItemID=30064](http://www.umes.edu/WorkArea/linkit.aspx?LinkIdentifier=id&ItemID=30064).

#### *UMES SOP Health and Immunization History Forms*

The following immunizations are required for Doctor of Pharmacy students:

- a. Tetanus (within last 10 years)
- b. Hepatitis B Series
- c. Varicella (chickenpox) [if no history of having the disease]
- d. MMR (Measles, Mumps and Rubella) 2 doses

- e. PPD (Tuberculosis skin test, 2 Step Mantoux Only) within the previous 6 months
- f. Meningitis Vaccine or waiver (on campus student)

#### Health Insurance Requirement

All students admitted to the program are required to have health insurance. Please fax a copy of your insurance card (front and back) to Pharmacy Student Affairs at 410-651-8394.

#### Criminal Background Check Requirement

All students are required to have a criminal background check (CBC) report on file in the School of Pharmacy Office of Student Affairs and Office of Experiential Education. The criminal background check is performed by Certified Background, Inc, at the expense of the student.

Please note the following:

1. The Criminal Background Check is MANDATORY.
2. Information from the CBC must be on file with the Offices of Student Affairs and Experiential Education, in the School of Pharmacy before the student secures a seat in the class.
3. Additional background checks may be required of external institutional partnerships prior to participation in experiential activities. Financial and other responsibilities for these CBCs are the sole responsibility of the student.
4. Information on obtaining the initial CBC is mailed to each student who has accepted an offer of admission with the School of Pharmacy for the incoming class.

#### The Pharmacy College Admission Test

The Pharmacy College Admission Test (PCAT) may be taken at any time, but no later than January of the year the student is seeking admission. Please contact the Psychological Corporation at 1-800-622-3231 or visit their website [www.pcatweb.info](http://www.pcatweb.info) for a PCAT application and additional PCAT information.

#### TOEFL

The Test Of English As A Foreign Language (TOEFL) is **NOT** required.

#### Grade Point Average

The minimum GPA for admission is 2.75. This GPA is calculated based on the pre-requisite coursework requirements listed below.

#### Course Requirements (Pre-requisites)

(Note: Credit Hours are given in parentheses)

Pre-pharmacy requirements may be taken at the University of Maryland Eastern Shore or any regionally accredited institution in the United States or Canada. AP, CLEP and International Baccalaureate Credits may be transferrable for non-science pre-requisite coursework. The pre-requisite course work necessary to qualify a prospective student for admission consideration is as follows:

General Chemistry (with lab, for science majors) 2 semesters (8)  
Organic Chemistry (with lab, for science majors) 2 semesters (8)

General Biology (with lab, for science majors) 1 semester (4)

Anatomy and Physiology (with lab)	2 semesters (8)
Microbiology (with lab)	1 semester (4)
Physics+	1 semester (4)
Calculus	1 semester (3-4)
Statistics	1 semester (3)
Public Speaking/Interpersonal Communications	1 semester(3)
English Composition and Literature	2 semesters (6)
Economics	1 semester (3)
Humanities/Social Sciences*	(12)

**Total Minimum Credits (Semester Credit Hours): 66-67 credits**

+ *With lab; May be Algebra or Calculus-based.*

\* *Recommended Sociology, Psychology, Arts, Music, History*

Please note: An Introductory Biochemistry Course is strongly encouraged.

### **Curriculum and Course Descriptions**

The three years of the program are designated SP-1 (first year), SP-2 (second year) and SP-3 (third year.) The SP-1, SP-2 and SP-3 years are divided into two terms, a fall term and a spring term. These terms are longer than a regular semester to allow for completion of the required credit hours. There are two major components of the program: the didactic and the experiential components.

#### **Didactic Component**

The didactic component consists primarily of classroom and laboratory experiences in the first two professional years (SP-1 and SP-2 years). The didactic content is delivered as a modular system in which students concentrate on one content area at a time. Each content area is allotted the appropriate amount of time to adequately cover the topic. The didactic portion of the SP-1 year is composed of 16 sequential modules plus four term-long courses (Pharmacy Calculations, Concepts in Diversity and Communication for the Pharmacist, Direct Patient Care in Pharmacy Practice, and Public Health for Pharmacists). The didactic material in the SP-1 year is predominantly composed of integrated basic science modules, with clinical correlates, and administrative science modules. The didactic portion of the SP-2 year consists of 15 sequential modules, four term-long courses (Top 200 Drugs and Integration of Pharmacy Practice I & II and Scientific Writing). The curricular content in the SP-2 year focuses on integrated clinical science modules with basic science correlates, and additional administrative science topics.

#### **Experiential Component**

The experiential component begins in the SP-1 year, is distributed throughout the program, and culminates in the Advanced Pharmacy Practice Experiences (APPEs) in the SP-3 year. An eight-hour Introductory Pharmacy Practice Experience (IPPE) occurs every two weeks throughout the SP-1 and SP-2 year. An IPPE seminar will accompany these practice experiences. Two concentrated IPPEs will occur in January and/or the summer between the SP-1 and SP-2 year. The APPEs will start in the summer of the SP-2 year and continue throughout the SP-3 year. The Professional Seminar course is a capstone course that will allow students to pull together elements of their entire educational experience. This course will include student presentations, case studies, and a board review.

### **First Professional Year (SP-1 Year) Didactic Curriculum**

*(Note: Credit Hours are given in parentheses)*



*PHAR 501 Basics of Drug Information and Introduction to Pharmacy Profession (1.5)*

This course provides an introduction to drug information skills and basic concepts in informatics. An overview of the historical development of the pharmacy profession in terms of its role in the United States Health Care Delivery System will also be discussed.

*PHAR 510 Fundamentals of Drug Action and Metabolism (4.5)*

A study of the composition and structure of proteins, classification of enzymes and coenzymes, enzyme kinetics and regulations, drug biotransformation, drug receptor properties, structural features of drugs, functional group properties and receptor interactions, fundamentals of pattern recognition that relate chemical structure to pharmacological action, drug dose response curves, membrane structure and transport, and mechanisms of signal transduction.

*PHAR 511 Genetic Controls of Cell Function, Cell Reproduction and Protein Synthesis (2.5)*

A study of the basic concepts of mammalian biochemistry including the biosynthesis of proteins, nucleic acid structure and function in gene expression at the cellular level in both normal and disease states. Additionally, there is an overview of nucleotide metabolism, an introduction to pharmacogenomics and an introduction to the pharmacology of antineoplastic agents.

*PHAR 512 Metabolism of Carbohydrates, Lipids, and Amino Acids (4)*

A study of the basic concepts and principles of mammalian biochemistry including the digestion, absorption, biosynthesis and metabolism of carbohydrates, lipids and amino acids at the cellular level in both the normal and disease states. The principles of energy transformations are also studied.

*PHAR 513 Hematology and Immunology (4)*

A study of basic hematology and immunology and the fundamental principles related to clinical immunology.

*PHAR 514 Biostatistics and Clinical Trial Design (1.5)*

Basic biostatistical concepts are studied and applied to the evaluation of pharmacy drug literature and clinical trial design.

*PHAR 520 Principles of Neurobiology and Neuropharmacology (1)*

This module reviews principles of neurobiology, and introduces basic concepts of pharmacology as applied to the autonomic and somatic nervous systems.

*PHAR 521 Cardiovascular and Renal Systems; Pharmacology and Medicinal Chemistry (2)*

This module introduces basic concepts of pharmacology and medicinal chemistry particularly as applied to the cardiovascular and renal systems. In this module, a study of the basic principles of drug action is presented for specific drug classes including: the chemical properties, mechanisms of drug action, routes of administration, clinical uses, disposition, contraindications, adverse reactions, clinically significant drug interactions, and drug disease interaction.

*PHAR 522 Gastrointestinal and Genitourinary: Pharmacology and Medicinal Chemistry (1)*

This module introduces basic concepts of pharmacology and medicinal chemistry particularly as applied to gastrointestinal and genitourinary systems. In this module, a study of the basic principles of drug action is presented for specific drug classes including: the chemical properties, mechanisms of drug action, routes of administration, clinical uses, disposition,

contraindications, adverse reactions, clinically significant drug interactions, and drug disease interaction.

*PHAR 523 Endocrine System: Pharmacology and Medicinal Chemistry (1.5)*

This module introduces basic concepts of pharmacology and medicinal chemistry as applied to the endocrine system. In this module, a study of the basic principles of drug action is presented for each specific drug class including: the chemical properties, mechanisms of drug action, routes of administration, clinical uses, disposition, contraindications, adverse reactions, clinically significant drug interactions, and drug disease interaction.

*PHAR 524 Toxicology (1)*

This module provides a study of the basic principles of toxicology along with an introduction to clinical toxicology.

*PHAR 525 Neuropharmacology and Medicinal Chemistry (3.5)*

This module continues a review of neurobiology and extends basic concepts of pharmacology and medicinal chemistry as applied to the autonomic and somatic nervous systems, and the central nervous system. In this module, a study of the basic principles of drug action is presented for specific drug classes including: the chemical properties, mechanisms of drug action, routes of administration, clinical uses, disposition, contraindications, adverse reactions, clinically significant drug interactions, and drug disease interaction.

*PHAR 530 Pharmaceutics and Biopharmaceutics (3)*

A study of the application of physical and chemical principles to the development, preparation, and stabilization of pharmaceutical dosage forms. Also included is a study of biological and physicochemical factors that influence the availability of a drug from a dosage form and the subsequent disposition and response of the drug in the body.

*PHAR 531 Pharmacokinetics (3.5)*

The application of the concepts of biopharmaceutics and pharmacokinetics to the processes of absorption, distribution, metabolism and excretion of drugs are discussed with the purpose of assessing drug dosage forms/regimens and improving the therapeutic management of patients. Additionally, the relationship between physiology, pharmacokinetics, pharmacodynamics and disease state is presented to help explain clinical variability to drug response.

*PHAR 540 Pharmacy Administration I – Health Care Delivery (2)*

This course provides a study of the evolution and organization of the US health care system, the role of pharmacy in the US health care system, influence of stakeholders, and the laws that have shaped contemporary pharmacy practice. Basic concepts of pharmacovigilance, informatics, and pharmacoeconomics will be discussed.

*PHAR 541 Pharmacy Law (1.5)*

A study of the basic provisions of State and Federal pharmacy laws and regulations pertaining to pharmacy practice, licensure, controlled substances, poison, legal liabilities, laws and regulations of other health care providers, and pharmacy case law.

*PHAR 542 Concepts in Diversity and Communication for the Pharmacist (3)*

This longitudinal course emphasizes the vital role of communication in contemporary pharmacy practice. Students are evaluated in both oral and written formats. Course content includes: an overview of diversity and differences important for the pharmacist to understand; study of professional interpersonal communication, verbal and nonverbal

communication strategies, effective interviewing techniques, patient counseling and the Top 200 drugs. Prerequisites: SP-1 Student.

*PHAR 543 Public Health for Pharmacists (2)*

This course (held throughout the 2nd term of the SP-1 year) will prepare students to identify public health issues and to identify populations at risk for a variety of diseases. Principles of epidemiology as a diagnostic discipline of population health will be explored. In addition, this course will enable the student to critically evaluate current trends in the care of patient populations. Issues relating to disaster planning and emergency preparedness will be discussed. Focus will be placed on the role of the pharmacist in the public health policy.

*PHAR 544 Direct Patient Care in Pharmacy Practice (3)*

This longitudinal course (held throughout the 2nd term of the SP-1 year) is designed to develop life-long essential skills students will utilize in patient-centered care. It will cover topics such as self-care & OTC products consultation, complementary and alternative medicine consultation, point of care devices, immunizations certification and smoking cessation education.

*PHAR 550 Pharmaceutical Calculations (2)*

This course (held throughout the 1st term of the SP-1 year) covers all aspects of pharmaceutical calculations including: fundamentals of measurement and calculation, measurement systems, dosage and concentration units, isotonic solutions, electrolyte solutions, and calculations related to compounding.

*PHAR 561 Professional Development I*

First in a series of professional development courses, students will learn skills and use tools to advance their professional growth, including electronic portfolios. As part of this process, students will develop professional mission statements and goals, and will explore various aspects of pharmacy through a biweekly professional forum series. Students will self-reflect and incorporate these skills to document participation in community service and continuing professional development, including professional organizations.

*PHAR 562 Professional Development II*

Second in a series of professional development courses, students will learn skills and use tools to advance their professional growth. Students continue to update their electronic portfolios and will prepare a self-reflection summarizing their development in the first professional year. They will continue to explore various aspects of pharmacy through a biweekly professional forum series, and to participate in community service and continuing professional development, including Legislative Day.

**Second Professional Year (SP-2 Year) Didactic Curriculum**

*(Note: Credit Hours are given in parentheses)*

*PHAR 609 Therapeutics of Self Care & Over the Counter Products (2)*

This course is designed to develop students' knowledge of self-treatable disorders of varying organ systems and prepare them to provide appropriate patient-centered care for patients that present with these disorders in an outpatient setting. The course will cover topics such as conducting a patient interview, recognition of self-treatable disorders, over the counter (OTC) treatments for common self-treatable disorders, counseling points for these treatments, and also recognition of disorders that require referral to a physician or other healthcare provider. In addition, students will become familiar with various medical devices and will be able to demonstrate and recommend these devices to patients.

*PHAR 610 Pharmacotherapy and Medication Management: Principles of Pharmacotherapy (2)*

This course provides an introduction to the concepts involved in ensuring the safe, appropriate, and economical use of drugs in patient care. Students will develop a basic foundation in medication therapy management through an overview of the general principles of case-based problem-solving and a systematic approach to rational drug selection.

*PHAR 611 Pharmacotherapy & Medication Management: Fluids, Electrolytes & Nephrology(2)*

An integrated study of anatomy, pathophysiology, physical and laboratory assessment, pharmacology, therapeutics, clinical pharmacokinetics, patient care, alternative/complementary therapies, pharmacoeconomic issues, medication use in special populations, and review of pertinent drug literature as they relate to fluid and electrolyte homeostasis, and the renal system.

*PHAR 612 Pharmacotherapy and Medication Management: Cardiology (5.5)*

An integrated study of anatomy, pathophysiology, physical assessment, pharmacology, therapeutics, clinical pharmacokinetics, patient care, alternative/complementary therapies, pharmacoeconomic issues, medication use in special populations, and review of pertinent drug literature as they relate to the cardiovascular system.

*PHAR 613 Pharmacotherapy & Medication Management: Immunology & Rheumatology (3)*

An integrated study of anatomy, pathophysiology, physical assessment, pharmacology, therapeutics, clinical pharmacokinetics, patient care, alternative/complementary therapies, pharmacoeconomic issues, medication use in special populations, and review of pertinent drug literature as they relate to the immune and musculoskeletal systems.

*PHAR 614 Pharmacotherapy & Medication Management: Pulmonology & Ophthalmology (2)*

An integrated study of anatomy, pathophysiology, physical assessment, pharmacology, therapeutics, clinical pharmacokinetics, patient care, alternative/complementary therapies, pharmacoeconomic issues, medication use in special populations, and review of pertinent drug literature as they relate to major the respiratory system and the eyes.

*PHAR 615 Pharmacotherapy and Medication Management: Gastroenterology (3)*

An integrated study of anatomy, pathophysiology, physical assessment, pharmacology, therapeutics, clinical pharmacokinetics, patient care, alternative/complementary therapies, pharmacoeconomic issues, medication use in special populations, and review of pertinent drug literature as they relate to the digestive system and nutrition therapy. In addition, optimal nutrition for healthy adults and children will be reviewed.

*PHAR 616 Pharmacotherapy and Medication Management: Infectious Disease I (3)*

Review of medical microbiology and the basic principles of antibiotic action including, for each specific antibiotic class, the mechanism of action, routes of administration, disposition, contraindications, adverse reactions, and clinically relevant drug interactions. Principles of antimicrobial regimen selection, susceptibility testing and trends in resistance will be discussed. Also included is an integrated study of anatomy, pathophysiology, physical assessment, pharmacology, therapeutics, clinical pharmacokinetics, patient care, alternative/complementary therapies, pharmacoeconomic issues, medication use in special populations, and review of pertinent drug literature as they relate to major bacterial infectious diseases.

*PHAR 617 Pharmacotherapy and Medication Management: Infectious Disease II (3)*

A continuation of PHAR 616, this module will include an integrated study of anatomy,

pathophysiology, physical assessment, pharmacology, therapeutics, clinical pharmacokinetics, patient care, alternative/complementary therapies, pharmacoeconomic issues, medication use in special populations, and review of pertinent drug literature as they relate to additional bacterial infections, as well as viral, mycobacterial, and fungal infectious diseases.

*PHAR 618 Pharmacotherapy and Medication Management: Psychiatry (2.5)*

An integrated study of anatomy, pathophysiology, physical assessment, pharmacology, therapeutics, clinical pharmacokinetics, patient care, alternative/complementary therapies, pharmacoeconomic issues, medication use in special populations, and review of pertinent drug literature as they relate to mental status.

*PHAR 619 Pharmacotherapy and Medication Management: Neurology (3)*

An integrated study of anatomy, pathophysiology, physical assessment, pharmacology, therapeutics, clinical alternative/complementary therapies, pharmacoeconomic issues, medication use in special populations, and review of pertinent drug literature as they relate to the nervous system.

*PHAR 620 Pharmacotherapy and Medication Management: Hematology/Oncology (3)*

This module explains the pharmacological principles of chemotherapeutic agents. Also included is an integrated study of anatomy, pathophysiology, physical assessment, pharmacology, therapeutics, clinical pharmacokinetics, patient care, alternative/complementary therapies, pharmacoeconomic issues, medication use in special populations, and review of pertinent drug literature as they relate to the hematological system and neoplasms. A focus on pain management will be included.

*PHAR 622 Pharmacotherapy and Medication Management: Endocrinology and Urology (3)*

An integrated study of anatomy, pathophysiology, physical assessment, pharmacology, therapeutics, clinical pharmacokinetics, patient care, alternative/complementary therapies, pharmacoeconomic issues, medication use in special populations, and review of pertinent drug literature as they relate to endocrine, reproductive and urinary systems.

*PHAR 624 Integration of Pharmacy Practice I (2.5)*

Part one of a two part series. This longitudinal module is designed to integrate the material from the various Pharmacotherapy and Medication Management modules and prepare the students for management of patient care in a clinical setting prior to the Advanced Pharmacy Practice Experiences (APPE). A study of the practical applications of pharmacy practice is presented with an emphasis on the use of patient charts, assessments, diagnostics, assessment of pharmacotherapy and patient education. Additional emphasis is placed on literature evaluation and the practice of evidence-based medicine.

*PHAR 625 Integration of Pharmacy Practice II (2.5)*

Part two of a two part series. This longitudinal module is a continuation of PHAR 625 and is designed to integrate the material from the various Pharmacotherapy and Medication Management modules and prepare the students for management of patient care in a clinical setting prior to the Advanced Pharmacy Practice Experiences (APPE). A study of the practical applications of pharmacy practice is presented with an emphasis on the use of patient charts, assessments, diagnostics, assessment of pharmacotherapy and patient education. Additional emphasis is placed on literature evaluation and the practice of evidence-based medicine.

*PHAR 630 Sterile Products (1.5)*

This course introduces concepts and properties of sterile products including application of aseptic techniques and laminar flow theory in the preparation of sterile products such as total

parenteral nutrition and chemotherapy preparations. Emphasis will be placed on parenteral calculations, sterile dosage forms and quality assurance programs.

*PHAR 640 Pharmacy Administration II- Management (3)*

This module examines the economic, social, and political forces affecting the delivery of health care services. In addition, the effect of these forces on pharmacy practice and the impact of pharmacy on the health care system are explored. Also included are concepts related to purchasing and operating a pharmacy practice and people management skills.

*PHAR 641 Practice of Drug Information and Literature Evaluation (2)*

This module provides a study of the practice of drug information, drug literature evaluation, literature searching techniques, and principles of evidence-based medicine.

*PHAR 650 TOP 200 Drugs (1)*

This longitudinal course (held throughout the 1st term of the SP-2 year) focuses on familiarizing students with the 200 most frequently prescribed drugs. For each drug, students will: identify the dosage form and strengths available; describe the mechanism of action; and identify drug interactions, contraindications, and black box warnings associated with the use of the drug.

*PHAR 660 Scientific Writing (1)*

This course (held throughout the 2nd term of the SP-2 year) will review basic principles of scientific writing. A series of assignments are included to give students an opportunity to apply skills learned in PHAR 501, 514, and 641 pertaining to searching, evaluating, summarizing, and referencing literature sources.

*PHAR 661 Professional Development III*

Third in a series of professional development courses, students will learn skills and use tools to advance their professional growth. Students update their professional mission statements and goals, and electronic portfolios. Students will learn to create effective Curriculum Vitae and use their strengths to prepare for Advanced Pharmacy Practice Experiences. They will continue to explore various aspects of Pharmacy through a biweekly professional forum series, and to participate in community service and continuing professional development, including leadership and mentorship.

*PHAR 662 Professional Development IV*

Fourth in a series of professional development courses, students will learn skills and use tools to advance their professional growth. Students continue to update their electronic portfolios and will prepare a self-reflection summarizing their development in the second professional year. Students will evaluate choices, learn job interview techniques, discuss pros and cons of residencies and board certification, and discuss balancing both professional and personal demands. They will continue to explore various aspects of Pharmacy through a biweekly professional forum series, and to participate in community service and continuing professional development, including leadership and mentorship.

**Third Professional Year (SP-3 Year) Didactic Curriculum**

*(Note: Credit Hours are given in parentheses)*

*PHAR 799 Advanced Seminar in Pharmacy and Therapeutics (2)*

The Advanced Seminar in pharmacy & Therapeutics (ASPT) is offered at the end of the third (SP-3) academic term following the students' successful completion of the required and elective APPE rotations, or with the permission of the SOP Associate Dean for Academic

Affairs. The module includes a series of faculty-led discussions and student-led active learning exercises. The faculty-led component includes a targeted review of specific curricular competencies. The active learning exercises consist of student-led presentations that will demonstrate the students' knowledge and skills related to the therapeutic or population-based decision-making. Students will also be assessed to determine readiness for licensure examination. Prerequisites: SP-3 Student and a successful completion of all required and elective APPE rotations.

### **Experiential Curriculum**

*(Note: Credit Hours are given in parentheses)*

#### *PHAR 571 Community Pharmacy Introductory Pharmacy Practice Experience (5)*

Community Pharmacy IPPE links key concepts in the SP-1 curriculum with contemporary pharmacy practice. The students will spend eight hours a day for three weeks in a community pharmacy setting to experience patient care activities and pharmacy operations. Students will also attend a community pharmacy preparatory class prior to their rotation start. By completing this course, students will earn academic credit and hours toward pharmacist licensure.

#### *PHAR 572 Institutional Pharmacy Introductory Pharmacy Practice Experience (5)*

Institutional Pharmacy IPPE links key concepts in the SP-1 curriculum with contemporary pharmacy practice. The students will spend eight hours a day for three weeks in an institutional pharmacy setting to experience patient care activities and pharmacy operations. Students will also attend an institutional pharmacy preparatory class prior to their rotation start. By completing this course, students will earn academic credit and hours toward pharmacist licensure.

#### *PHAR 671 Introductory Pharmacy Practice Experience III (2)*

IPPE 3 links key concepts in the SP-2 fall curriculum with contemporary pharmacy practice. Students will spend two hours with an assigned patient every other week to experience patient care activities. Students will participate in guided discussions about the previous week's assignment to strengthen the learning experience. By completing this course, students will earn academic credit and hours toward pharmacist licensure.

#### *PHAR 672 Introductory Pharmacy Practice Experience 4 (2)*

IPPE 4 links key concepts in the SP-2 curriculum with contemporary pharmacy practice. Students will spend two hours with an assigned patient every other week to experience patient care activities. Students will participate in guided discussions about the previous week's assignment to strengthen the learning experience. By completing this course, students will earn academic credit and hours toward pharmacist licensure.

### **Advanced Pharmacy Practice Experience (APPE)**

The student must take 8 five-week rotations (minimum of 40/hours/week) for a total of 1600 hours. Each student will participate in five required APPEs, 2 personal choice APPEs, and 1 elective APPE.

### **Required APPEs**

*(Note: Credit Hours are given in parentheses)*

#### *PHAR 700 Advanced Pharmacy Practice Experience (APPE) – Advanced Community Practice (5)*

This is one of five required rotations. The Advanced Community rotation affords students the opportunity to effectively participate in the patient care decision-making process. Emphasis

will be placed on the student's ability to demonstrate his or her understanding of common disease states and treatment modalities as well as the ability to provide patient-centered care and medication management. APPE Competencies and Ability-based Outcomes, self-reflections and documented interventions will be used by the preceptor to evaluate the student; the electronic evaluation is submitted for review by the School after the third week and at the end of the rotation.

*PHAR 701 APPE – Advance Institutional Practice (5)*

This is one of five required rotations. The purpose of this rotation is for students to gain professional skills in an institutional pharmacy setting. The Institutional Pharmacy rotation affords students the opportunity to effectively participate in the patient care decision-making process. Students will participate in a variety of clinical activities, functioning as an integral member of the health care team. Emphasis will be placed on the student's ability to demonstrate his or her understanding of common disease states and treatment modalities as well as the ability to provide patient-centered care and medication management. APPE Competencies and Ability-based Outcomes, self-reflections, and documented interventions will be used by the preceptor to evaluate the student; the electronic evaluation is submitted for review by the School after the third week and at the end of the rotation.

*PHAR 702 APPE – Acute Care (5)*

This is one of five required rotations. The purpose of this rotation is for students to gain professional skills in an internal general medicine setting. The Internal General Medicine rotation affords students the opportunity to effectively participate in the patient care decision-making process. Students will participate in a variety of clinical activities, functioning as an integral member of the health care team. Emphasis will be placed on the student's ability to demonstrate his or her understanding of common disease states and treatment modalities as well as the ability to provide patient-centered care and medication management. APPE Competencies and Ability-based Outcomes, self-reflections, and documented interventions will be used by the preceptor to evaluate the student; the electronic evaluation is submitted for review by the School after the third week and at the end of the rotation.

*PHAR 703 APPE – Ambulatory Care (5)*

This is one of five required rotations. The purpose of this rotation is for students to gain professional skills in an ambulatory care practice environment. The Ambulatory Care rotation affords students the opportunity to effectively participate in the patient care decision-making process. Students will participate in a variety of clinical activities, functioning as an integral member of the health care team. Emphasis will be placed on the student's ability to demonstrate his or her understanding of common disease states and treatment modalities as well as their ability to provide patient-centered care and medication management. APPE Competencies and Ability-based Outcomes, self-reflections, and documented interventions will be used by the preceptor to evaluate the student; the electronic evaluation is submitted for review by the School after the third week and at the end of the rotation.

**Elective APPEs**

Each student must choose four APPEs from the following list.

*PHAR 704 APPE – Public Health (5)*

This is one of five required rotations. Emphasis will be placed on the student's ability to demonstrate his or her understanding of evidence-based practice, health promotion (disease prevention), health systems and policy, as well as community service. Through partnerships with local health departments students will actively participate in a multidisciplinary team and



provide patient-centered care to the local patient population. Also, during the 5 week APPE the student will participate in a population-based research project. APPE competencies, Ability-based Outcomes, self-reflections and the research project will be used by the preceptor to evaluate the student; the electronic evaluation is submitted for review by the School after the third week and at the end of the rotation.

*PHAR 710 Personal Choice APPE – Drug Information (5)*

This may be used as one of two personal choice APPEs. This rotation is designed to allow the student to develop a systematic approach to responding to drug information inquiries. This rotation includes: identifying the question, researching, and evaluating relevant literature; applying the results of the research to the question; and communicating the answer to the inquirer under the supervision of a preceptor. APPE Competencies and Ability-based Outcomes, self-reflections, and documented interventions will be used by the preceptor to evaluate the student; the electronic evaluation is submitted for review by the School after the third week and at the end of the rotation.

*PHAR 711 Personal Choice APPE – Home Infusion (5)*

This may be used as one of two personal choice APPEs. This experience will focus on providing infusion services from a community-based pharmacy operation for home bound or institutionalized patients. The student will gain experience in the research, preparation and distribution of various home-infusion therapies. Home-infusion therapies to be covered include, but are not limited to; parenteral and enteral nutrition, intravenous (IV) antimicrobials, IV hydration, IV chemotherapeutic agents, and pain management. Participation on the home infusion clinical/operational team will enhance the student's understanding of interprofessional teamwork. Business aspects will be covered, including key financial and operational issues, reimbursement, regulatory issues, quality assurance, and patient safety. APPE Competencies and Ability-based Outcomes, self-reflections, and documented interventions will be used by the preceptor to evaluate the student; the electronic evaluation is submitted for review by the School after the third week and at the end of the rotation.

*PHAR 712 Personal Choice APPE – Management (5)*

This may be used as one of two personal choice APPEs. This rotation is designed to further develop the student's knowledge and understanding of pharmacy administration / management under the supervision of a preceptor. The practice setting and scope of practice will vary according to the individual site. APPE Competencies and Ability-based Outcomes, self-reflections, and documented interventions will be used by the preceptor to evaluate the student; the electronic evaluation is submitted for review by the School after the third week and at the end of the rotation.

*PHAR 713 Personal Choice APPE – Emergency Medicine (5)*

This may be used as one of two personal choice APPEs. The student will gain experience in providing comprehensive clinical pharmacy services for the emergency department (ED) and all associated areas (e.g., pediatrics, trauma, urgent care). Specific activities include: providing pharmacokinetic services and therapeutic consultative services which focus on appropriate evidence based medication utilization, monitoring patient therapeutic responses to administered medications, providing drug information for emergency department healthcare providers, obtaining accurate medication histories and participating in the medication reconciliation process throughout the admission/transfer/discharge process, performing a prospective review of high-risk medication orders, providing discharge medication counseling, provision of cost saving measures for medication use in the ED, and interprofessional

teamwork within the ED and with other units throughout the hospital. APPE Competencies and Ability-based Outcomes, self-reflections, and documented interventions will be used by the preceptor to evaluate the student; the electronic evaluation is submitted for review by the School after the third week and at the end of the rotation.

**PHAR 714 Personal Choice APPE Hematology/Oncology (5)**

This may be used as one of two personal choice APPEs. The student will gain experience in providing comprehensive clinical pharmacy services for the hematology/oncology unit. Preparation, distribution and administration of chemotherapy will also be covered. The student will participate in the provision of patient-centered care for hematologic and oncologic disease states, palliative care, pain management, oncologic emergencies and critical care issues. Participation on the hematology/oncology team will enhance the student's understand of interprofessional teamwork. APPE Competencies and Ability-based Outcomes, self-reflections, and documented interventions will be used by the preceptor to evaluate the student; the electronic evaluation is submitted for review by the School after the third week and at the end of the rotation.

**PHAR 715 APPE – Patient Care (5)**

*The Patient Care advanced elective experience is offered in practice settings where there is a significant emphasis on patient care. Students will apply knowledge, skills, and abilities developed throughout the curriculum to provide patient-centered care. The rotations may include focus areas such as infectious disease, pediatrics, cardiology, psychiatry, geriatrics, long term care, transplant, internal medicine, women's health, and medication therapy management (MTM).*

**PHAR 720 APPE – General Elective (5)**

One APPE can be an elective and choices may include: Adult Medicine, Cardiology, Intensive Care, Long Term Care, Psychiatry, Pediatrics, Academic, Organizational Pharmacy, Rehabilitation, Pharmacoeconomics, Independent Pharmacy, Compounding, Nuclear Pharmacy, Regulatory, Research, and Industry. Elective clerkships can be performed in non patient-care environments. The elective provides the student the opportunity to pursue a specific area of pharmacy under the supervision of a preceptor. Specialty areas will vary according to preceptor and site availability. APPE Competencies and Ability-based Outcomes, self-reflections, and documented interventions will be used by the preceptor to evaluate the student; the electronic evaluation is submitted for review by the School after the third week and at the end of the rotation.

**Elective Offerings**

Elective courses are typically offered during the SP- 2 year. It is possible to take electives in the spring of the SP-1 year with approval by the Associate Dean of Academic Affairs. Not all elective courses will be offered every academic year. The student must have 6 credits of electives to be able to graduate.

**PHAR 680 Independent Studies in Pharmaceutical Research (1-6)**

This elective module will introduce student to methods of basic science research in pharmaceutical sciences through a faculty mentor-directed project. This involves application of the scientific process that includes: (1) formulating the hypothesis, (2) reading of scientific literature and evaluation, (3) experimental design, (4) development of technical skills, (5) data acquisition and analysis, (6) presentation of results.

***PHAR 681 Directed Studies in Pharmacy Sciences (1-6)***

This course provides an opportunity for qualified pharmacy students to engage in specialized study or investigative work in pharmaceutical, social/administrative or clinical sciences with specific faculty, through a faculty mentor-directed project. This project is intended to provide students with a practical hands-on experience to apply knowledge obtained from the didactic setting. The student(s) and faculty will develop a detailed study plan with discrete objectives and outcomes Credits: 1-6

***PHAR 682 Introductory Spanish for the Pharmacist (3)***

This course taught provides the student with the introductory tools to develop sufficient listening and speaking skills in Spanish for the pharmacy setting to facilitate patient counseling and education in the appropriate use of medications.

***PHAR 683 Advanced Immunology (1)***

This course will discuss the current progress of areas related to immunology including tumor immunity, virus immunity, or auto-immune diseases. Each year will focus on one of these three topics. Contents include lectures by faculty, seminar by invited speakers, and article presentation by students.

***PHAR 684 Advanced Topics in Cardiovascular Pharmacotherapy (2)***

This is an elective course designed to expand on the topics covered during the prerequisite PHAR 612 PTMM: Cardiology module. Students will be exposed to advanced issues involving cardiovascular therapeutics through a combination of online presentations and face-to-face discussions. A systematic approach to the identification and resolution of drug therapy problems will be developed through the use of various methodologies, including work-ups of patient cases, journal club exercises, and debates of clinical controversies. Students will be expected to justify their decisions based on an evaluation of the current literature.

***PHAR 685 Advanced Topics in Emergency Medicine & Clinical Toxicology (1)***

This elective is designed to enhance the students' knowledge of therapeutic and practice areas in emergency medicine and clinical toxicology. Evidence-based medicine and clinical scenarios will be emphasized and utilized for managing patients with emergent medical or toxicological conditions. Examples of topics to be covered include: trauma, respiratory and hypertensive emergencies, toxic alcohols, venomous creatures, and overdoses of salicylates, cardiovascular agents, anti-diabetic medications, and drugs of abuse. Establishing a clinical pharmacy practice in emergency medicine will also be discussed.

***PHAR 686 American Sign Language for Pharmacists (3)***

The goal of this course is to provide the pharmacy student with the tools to develop sufficient communication skills in American Sign Language in order to engage in basic conversation, provide basic patient education and medication interaction information.

***PHAR 687 Beyond the Mortar and Pestle of Pharmaceutical Compounding (1)***

This elective course will provide advanced training in the art, science and technology of pharmaceutical compounding. Various aspects of the art and science of compounding will be discussed and demonstrated. Students will apply and practice their calculation and compounding skills with formulations used commonly by current practitioners.

*PHAR 688 Complementary & Alternative Medicine (CAM): Prevention, Maintenance, & Treatment for Health (1)*

An introduction to complementary and alternative medicine, an overview of its current use in the prevention, maintenance and treatment of human disease will be provided. The integration of CAM with western medicine will be reviewed.

*PHAR 689 Critical Care: An Overview of Critical Care Disorders & Critical Care Pharmacotherapy (1)*

The critical care elective is designed to facilitate patient-centered care for adult critical care patients and to expand students' knowledge regarding roles that pharmacists play in the intensive care unit. Evidence-based medicine and clinical variables will be emphasized and applied to the management of pharmacotherapy in acute care clinical practice. Students will be exposed to the pathophysiology and complex pharmacotherapy of a broad scope of disease states frequently encountered in an intensive care setting. Examples of topics to be covered include: acid-base disorders, acute coronary syndromes, delirium, fluid and electrolyte management, renal disorders, respiratory disorders, severe sepsis, shock.

*PHAR 690 A Pharmacy Student's Guide to Early Clinical Drug Development (1)*

This course will focus on the early clinical drug development including the rationale and study design of studies needed for the clinical pharmacology section of new drug applications. Lectures will involve the challenges regarding discovery research, development, formulations and manufacturing and regulatory issues in the creation of new products for patient care. The course will require students to assimilate the information from pharmaceuticals, pharmacokinetics, pharmacology and pharmacotherapy and be able to write out and verbally present on drug development issues. The class will be an interactive format with student questions / discussion being fostered in class, along with student product presentation by each student.

*PHAR 691 Home Infusion Pharmacy Practice (1)*

This module provides an overview of home infusion therapy including history, business and therapy overviews, VAD and Infusion Device Overview, Overview of the home infusion clinical/operational team, Reimbursement and Regulatory Issues (general information only), Quality Outcomes and Patient Safety (general information only), Future practice considerations

*PHAR 692 Venous Thromboembolism (VTE) Pharmacotherapy in the Acute Care Setting (1)*

This course will provide in depth coverage of current practice, clinical assessment skills and guidelines pertaining to drug therapy selection, monitoring and dosing of anti-thrombosis therapy used to treat and prevent VTE in hospitalized patients.

*PHAR 693 Venous Thromboembolism (VTE) Pharmacotherapy in the Chronic Care Setting (1)*

This course will provide in depth coverage of current practice, clinical assessment skills and guidelines pertaining to drug therapy selection, monitoring and dosing of anti-thrombosis therapy used to treat and prevent VTE in outpatients.

*PHAR 694 Channelopathies: When Good Channels Go Bad (1)*

This elective module will introduce students to channelopathies, or the pathology of ion channels. Channelopathies are implicated in various disorders that can alter the function of skeletal muscle, neurons and other organ systems in the body including epilepsy, migraines, cystic fibrosis, and fibromyalgia. These disorders can originate from genetic changes or from changes in gene expression. Students will learn about the various channelopathies based on

the ion channels affected, the pathological characteristics of the disease and pharmacological interventions. Students will also learn about the development of novel techniques in the treatment of channelopathies.

*PHAR 695 Leadership & Advocacy in Pharmacy (1)*

This elective course is offered to provide leadership and political advocacy development for pharmacy students. Students will examine the role of pharmacists in political advocacy and community action as they explore current healthcare issues. Students will have the opportunity to interact with local and national political leaders.

*PHAR 696 Inter-Professional Team Interactions (1)*

This course will be open to pharmacy, physical therapy, physician assistant and re-habilitation graduate students. This inter-professional course focuses on understanding roles, teamwork and communication to improve patient outcomes in the health care environment. National standards and initiatives serve as a major focus for this to the course. Students will work in teams to explore cases with elements common to all professionals such as ethical, behavioral, social and psychological issues and prepare a collaborative practice project or model.

*PHAR 697 Pharmaceuticals and Personal Care Products (PPCP) as Pollutants (1)*

This course provides an overview of the different aspects of PPCP pollutants. This includes discussions on: 1) common examples of PPCPs such as chemical substances, i.e. prescription and OTC therapeutic drugs, veterinary drugs, fragrances and cosmetics, 2) different sources of PPCPs such as human activity, manufacturing, hospitals, illicit drugs, veterinary use and agribusiness, 3) fate of PPCPs in the environment and 4) the strategies that are and can be used to protect the health of both the environment and the public.

**Doctor of Pharmacy Curriculum Overview**

Credit hours are received for the sequential courses through regularly scheduled assessments. Each term is divided into two-week blocks; an assessment will be given at the end of the two-week block. Since the sequential modules are not uniform in length, the assessment block may contain material from one module, part of a module, or a combination of two modules.

Credit hours are also assigned to longitudinal courses, electives, and experiential rotations. A total of 58 credit hours must be complete to advance to the SP-2 year. A total of 120.5 credits must be completed to be eligible to advance to the SP-3 year and a total 162.5 credits must be completed to be eligible for graduation.

Credit hours are assigned with the general rule that 15 class hours are equivalent to one semester credit hour, 3 laboratory hours are equivalent to one class hour, and 40 experiential hours are equivalent to one semester credit hour. Minor changes may be required in credit hours from year to year, based on changes to the curriculum.

*First Academic Year (SP-1)*

*(Note: Credit Hours are given in parentheses)*

Assessment Blocks 1-17	(38)
Pharmaceutical Calculations	(2)
Pharmacy Communications	(3)
Public Health for Pharmacists	(2)
Direct Patient Care in Pharmacy Practice	(3)
IPPE I & II	(6)
CIPPE I	(4)

**Total Semester Credit Hours: 58**

Second Academic Year (SP-2)

*(Note: Credit Hours are given in parentheses)*

CIPPE II	(2)
Assessment Blocks 18-35	(41.5)
Top 200 Drugs	(1)
Scientific writing	(1)
IPPE III & IV	(6)
Didactic Electives	(6)
Integrated Pharmacy Practice I & II	(5)
<i>Total Semester Credit Hours: 62.5</i>	

Third Academic Year (SP-3)

*(Note: Credit Hours are given in parentheses)*

APPEs Required	(25)
APPEs Personal Choice	(10)
APPE Elective	(5)
Professional Seminar	(2)
<i>Total Semester Credit Hours:</i>	<i>42</i>
<u>Total Required Hours: 162.5</u>	

**For more information on the program, please visit**  
[www.umes.edu/pharmacy/Default.aspx?id=12982](http://www.umes.edu/pharmacy/Default.aspx?id=12982)

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