Appendix I: Completion of UMES Engineering BS requirements in the SU-UMES Physics/Engineering Dual-Degree Program (Academic Year 2016-2017)[1]

General Education: 40 Credits	Req. Cr.	SU Course	UMES Cr.	SU Course	Comments
Area – I (Arts & Humanities) – 9 credits					
Discipline A[1]:ARTS	3	3-4		Group IIIA[6]: ART or MUSC	
Discipline B[2] or D[3]	3	3-4		Group IB[7] or Group IIA/B	
ENGL 203 Speech	3		3		May take at UMES or SU (CMAT 100, 101 or 260)
Area – II (Social & Behavioral Science) - 6 credits					
Discipline A[4]:Social Sciences	3	4		Group IIIB[8]: Human GEOG, SOCI, ECON & POSC	
Discipline B[5]: Behavioral Sciences	3	4		Group IIIA[6]: PSYC or CADR	
Area – III (Biological & Physical Science) – 8 credits					
CHEM 111 or BIOL 111	3	4		CHEM 121 Gen. Chemistry	
CHEM 113 or BIOL 113	1				
PHYS 161 or 181H	3	4		PHYS 221 Physics I	
PHYS 163 or 183H	1				
Area – IV (Mathematics) – 4 credits					
MATH 112 Calculus I	4	4		MATH 201 Calculus I	
Area – V (English Composition) – 9 credits					
ENGL 101 or ENGL 101H	3	4		ENGL 103 Composition & Research	
ENGL 102 or ENGL 102H	3				
ENGL 305/H or ENGL 310/H	3		3		
Area – VI (Emerging Issues) – 4 credits					
ENGE 100 (First Year Experience)	1				Waive with minimum of 40 General Education credits
EXSC111 or HUEC230 or TMGT306 or EDTE 111	3	3		FTWL 106 Per Health/Fitness	
Supporting Science and Mathematics Math Requirements: 19 Credits					
MATH 211 Calculus II	4	4		MATH 202 Calculus II	

[1] General education requirements typically will be completed at Salisbury University.

MATH 212 Calculus III	4	4		MATH 310 Calculus III	
MATH 241 DE for Engineers	3	3		MATH 311 Diff Equ. I	
PHYS 262 Gen. Physics II	3	4		PHYS 223 Physics II	
PHYS 264 Gen. Physics II Lab.	1				
PHYS 263 Gen. Physics III	3	3		PHYS 225 Physics III	
PHYS 265 Gen. Physics III Lab.	1		1		
Engineering Core Req: 48 Credits					
ENGE 150 Engineering Design	3	3		ENGR 100 Eng. Design	
ENGE 170 Programming for Eng.	3		3		
ENGE 240 Basic Circuit Theory	3	4		PHYS 311 Electrical Circuits (4 credits)	
ENGE 241 Analog Circ. Lab.	1				
ENGE 250 Digital Logic Design	3		3		
ENGE 251 Digital Logic Lab	1		1		
ENGE 260 Statics	3	3		ENGR 110 Statics	
ENGE 261 Dynamics	3	3		ENGR 221 Dynamics	
ENGE 270 Comp Aided Design	3		3		
ENGE 320 Statistics and Prob.	3		3		
ENGE 340 Electronics	3		3		
ENGE 341 Electronics Lab	1		1		
ENGE 362 Mechanics of Material	3	3		ENGR 220 Mech. of Mat.	
ENGE 370 Computational Meth.	3		3		
ENGE 380 Instrumentations	3		3		
ENGE 382 Control Systems	3		3		
ENGE 383 Instr. & Control Lab	1		1		
ENGE 475 Engineering Seminar	1		1		
ENGE 476 Senior Design Project I	2		2		
ENGE 477 Senior Design Project II	2		2		

Engineering Specialization Req: 17 Credits					
Specialization Elective[9]	3		3		
Specialization Elective[9]	3		3		
Specialization Elective[9]	3		3		
Specialization Elective[9]	3		3		
Specialization Elective[9]	3		3		
Specialization Elective Lab[9]	2		2		
Additional UMES Credit Req: 4 Credits					
Specialization Elective[10]			3		
UMES Course of at least 1 credit hour[10]			1		
Total Credits	124	67-69	60		

[1]UMES General Education Curriculum Area I Discipline A (ARTS) Requirements: ARTS 101, ARTS 310, MUSI 100, MUSI 101, MUSI 109

[2] UMES General Education Curriculum Area I Discipline D (LITERATURE) Requirements: ENGL 204, ENGL 205, ENGL 207.

[3] UMES General Education Curriculum Area I Discipline B (HISTORY) Requirements: HIST101/101H, HIST102/102H, HIST201, HIST202, PHIL 201.

[4] UMES General Education Curriculum Area II Discipline A (SOCIAL SCIENCES) Requirements: GEOG 201, GEOG 202, HIST 101/101H, HIST 102/102H, HIST 202, PHIL 201, POLI 200/200H, POLI 220H, POLI 342, SOCI 101/101H, ECON 201/201H, ECON 202

[5] UMES General Education Curriculum Area II Discipline B (BEHAVIORAL SCIENCES) Requirements: CRJS 101, HUEC 220, HUEC 361, PSYC 200, SOCI 201.

[6] SU General Education Group III A (Humanities and Social Sciences) Requirements: ART, CMAT, DANC or THEA, MDFL, MUSC, PHIL, HONR 211.

[7] SU General Education Group I B (History) Requirements: HIST 101, HIST 102, HIST 103 or HIST course above 103.

[8] SU General Education Group III B (Humanities and Social Sciences) Requirements: ANTH, CADR, ECON, Human GEOG, POSC, PSYC, SOCI, HONR 112.

[9] ENGINEERING SPECIALIZATION REQUIREMENTS (Credits 17) Students must take five courses and one lab from one of the following areas of specialization (i.e. Specialization electives):

Aerospace Specialization (ENAE)		**Credits**
ENAE 342	Fluid Mechanics	3
ENAE 442	Micro Electro-Mechanical Systems (MEMS)	3
ENAE 345	Thermodynamics	3
ENAE 462	Digital Control Systems	3
ENAE 389	Space Systems Design	3
ENAE 464	Embedded Systems Design Laboratory	2
ENAE 412	Space Navigation and Guidance	3
ENAE 465	Remote Sensing and Image Processing	3
ENAE 420	Aerodynamics	3
ENAE 467	Design of Autonomous Aerial Systems	3
ENAE 430	Finite Element Analysis	3
ENAE 472	Selected Topics in Engineering	3
ENAE 440	Mechatronics	3

Computer Specialization (ENCE)		**Credits**
ENCE 330	Signals and Systems	3
ENCE 458	VLSI Design	3
ENCE 350	Computer Organization	3
ENCE 460	Digital Signal Processing	3
ENCE 352	Microprocessors and Microcomputers	3
ENCE 462	Digital Control Systems	3
ENCE 387	Simulation and Virtual Reality	3
ENCE 464	Embedded Systems Design Laboratory	2
ENCE 452	Artificial Intelligence	3
ENCE 468	Robotics	3
ENCE 454	Computer System Architecture	3
ENCE 469	Robotics and Automation Design Laboratory	2

ENCE 456	Microprocessors Design Laboratory	2
ENCE 472	Selected Topics in Engineering	3

Electrical Specialization (ENEE)		**Credits**
ENEE 330	Signals and Systems	3
ENEE 348	Electromagnetic Theory	3
ENEE 385	Power Electronics	3
ENEE 460	Digital Signal Processing	3
ENEE 465	Remote Sensing and Image Processing	3
ENEE 462	Digital Control Systems	3
ENEE 387	Simulation and Virtual Reality	3
ENEE 464	Embedded Systems Design Laboratory	2
ENEE 443	Communication Systems	3
ENEE 468	Robotics	3
ENEE 454	Computer System Architecture	3
ENEE 469	Robotics and Automation Design Laboratory	2
ENEE 444	Communications Design Laboratory	2
ENEE 472	Selected Topics in Engineering	3

Mechanical Specialization (ENME)		**Credits**
ENME 342	Fluid Mechanics	3
ENME 442	Micro Electro-Mechanical Systems (MEMS)	3
ENME 345	Thermodynamics	3
ENME 462	Digital Control Systems	3
ENME 346	Heat transfer	3
ENME 464	Embedded Systems Design Laboratory	2
ENME 422	Mechanisms and Machine Design	3
ENME 468	Robotics	3
ENME 425	Rapid Prototyping and Product Develop.	3
ENME 469	Robotic and Automation Design Laboratory	2
ENME 430	Finite Element Analysis	3
ENME 472	Selected Topics in Engineering	3
ENME 440	Mechatronics	3

[10] Additional 4 credit-hour is required to satisfy UMES minimum credit hours of 60. Students in the 3+2 Dual Degree Physics/Engineering program need to take an Engineering Specialization Elective (3 credit hours) and an additional course of at least 1 credit hour at UMES (e.g., a General Education course or an Engineering Specialization Elective) to be granted a UMES bachelor's degree in Engineering.

Appendix II: PHYSICS Dual Degree Engineering Transfer Program 2016-2017

Salisbury University/University of Maryland Eastern Shore
SU Degree Requirements (see www.salisbury.edu/checklists**)**

GENERAL EDUCATION REQUIREMENTS (completed at Salisbury University)

Group I: English Composition and Literature (2 courses)

A. C or better in ENGL 103 or HONR 111 (4 credit hours)

B. Literature course (from either ENGL or MDFL Depts.) (4 credit hours)

Group II: History (2 courses)

A. HIST101, 102, or 103 (4 credit hours)

B. HIST101, 102, 103 or a HIST course above 103 (4 credit hours)

Group III: Humanities and Social Sciences (3 courses)

A. CMAT course completed as ENGL 203 at UMES (3 credit hours)

B. Select one course from one of the following eight areas:
ANTH, CADR, ECON or FINA, ENVR, Human GEOG, POSC, PSYC, SOCI, HONR 112 (3/4 credit hours)

C. Select one course from ART, DANC or THEA, MDFL, MUSC, PHIL, HONR 211 or IIIB (course must be from a different area than previously selected) (3/4 credit hours)

Group IV: Natural Science, Math and Computer Science

FULFILLED THROUGH MAJOR REQUIREMENTS

Group V: Health Fitness (1 course)

FTWL106 - Lifelong Fitness and Wellness (3 credit hours)

MAJOR REQUIREMENTS (All required physics courses must be completed with a minimum overall GPA of 2.0).

CHEMISTRY (2 courses)

CHEM 121 - General Chemistry I (4 credit hours)
CHEM 122 - General Chemistry II (4 credit hours)

MATH (4 courses)

MATH 201 - Calculus I (4 credit hours)
MATH 202 - Calculus II (4 credit hours)
MATH 310 - Calculus III (4 credit hours)
MATH 311 - Differential Equations I (4 credit hours)

PHYSICS CORE (8 courses)

PHYS 221 - Physics I (4 credit hours)
PHYS 223 - Physics II (4 credit hours)
PHYS 225 - Physics III (3 credit hours)
PHYS 309 - Mathematical Physics (3 credit hours)
PHYS 311 - Electrical Circuits and Electronics (4 credit hours)
PHYS 313 - Introduction to Modern Physics (3 credit hours)
PHYS 314 - Mechanics (3 credit hours)
PHYS 315 - Electricity and Magnetism (3 credit hours)

ENGINEERING ELECTIVES

ENGR100 - Introduction to Engineering Design (3 credit hours)
ENGR 110 - Statics (3 credit hours)
ENGR 220 - Mechanics of Materials (3 credit hours)
ENGR 221 - Dynamics (3 credit hours)

RECEIVING INSTITUTION REQUIREMENTS

• Complete a minimum of 90 credit hours at SU, including all required General Education courses, the physics core and appropriate engineering courses. Transfer students entering SU's dual-degree program are required to complete a minimum of 60 semester hours at SU.

• Apply for admission and be accepted to an ABET (Accreditation Board for Engineering and Technology)-accredited engineering school (in this case, at UMES).

• Complete an additional 30 hours, including at least 15 hours in engineering or related courses, at the receiving institution to be transferred to SU to receive a physics baccalaureate degree from SU.

• To receive an engineering degree, additional coursework must be completed at the receiving institution according to the requirements of the engineering school attended (see Appendix I).

Appendix III: Tentative ten semester UMES Engineering program course sequence for SU/UMES Physics/Engineering dual-Degree Program students is as follows. First through third year at SU[i]; Years 4 and 5 at UMES.

FIRST YEAR (SU)

Fall (16 credit hours)	Spring (15 credit hours)
PHYS 221 (4)	PHYS 223 (4)
MATH 201 (4)	MATH 202 (4)
ENGL 103 (4)	HIST 101/2/3 (4)
GENE IIIC (4)	ENGR 100 (3)

SECOND YEAR (SU)

Fall (15 credit hours)	Spring (18 credit hours)
PHYSICS 225 (3)	PHYS 309 (3)
MATH 310 (4)	MATH 311 (4)
CHEM 121 (4)	CHEM 122 (4)
ENGL LIT (4)	GENE IIIB (4)
	ENGR 110 (3)

THIRD YEAR (SU)

Fall (14 credit hours)	Spring (12 credit hours)
PHYS 311 (4)	PHYS 314 (3)
PHYS 313 (3)	PHYS 315 (3)
HIST xxx (4)	FTWL 106 (3)
ENGR 220 (3)	ENGR 221 (3)

FOURTH YEAR (UMES)

Fall (16 credit hours)	Spring (15 credit hours)
ENGE 170 (3)	ENGE 250 (3)
ENGE 340 (3)	ENGE 251 (1)
ENGE 341 (1)	ENGE 270 (3)
ENGE 370 (3)	ENGE 382 (3)
ENGE 380 (3)	ENGE 383 (1)
Specialization Elective (3)	Specialization Elective (3)
	PHYS 265 (1)

FIFTH YEAR (UMES)

Fall (16 credit hours)	Spring (13 credit hours)
ENGL 203 (3)	ENGL 305 (3)
ENGE 320 (3)	ENGE 477 (2)
ENGE 476 (2)	ENGE 475 (1)
Specialization Elective (3)	Specialization Elective (3)
Specialization Elective (3)	Specialization Elective (3)
Specialization Lab (2)	Additional UMES course (at least 1)

[i] MUST COMPLETE 30 HOURS AT THE 300/400 LEVEL WITH A GRADE OF "C" OR BETTER. NEED 120 TOTAL CREDITS FOR GRADUATION. ***ALL REQUIRED PHYSICS COURSES MUST BE COMPLETED WITH A MINIMUM OVERALL GPA OF 2.0.***