

## Curriculum of the UMES Mechanical Engineering program

### General requirements of the degree

The Engineering program consists of 120 total credit hours. The curricula include 28 credit hours of general education courses in English, arts and humanities, social and behavioral sciences, and emerging issues. An additional 12 credits in mathematics and physical sciences are required under the General Education program, which are included as a part of the requirements for the Engineering major. This makes the total credits for General Education to be 39 credit hours. The engineering curriculum also requires 19 credits for supportive math and physics courses. Students take 54 credit hours of mechanical engineering courses. Students choose 8 credit hours of mechanical engineering elective courses. The program is on a semester basis.

### Total number of credits and their distribution

	<u>Category</u>	<u>Distribution</u>
I.	General Education Courses	39 credit hours
II.	Supportive Math & Science Courses	19 credit hours
III.	Mechanical Engineering Courses	54 credit hours
IV.	Mechanical Engineering (ME) Elective Courses	8 credit hours

### List of Courses by Title and Level

#### I. General Education Requirements                      39 Credit Hours

##### Curriculum Area 1    6 Credit Hours required

Elective Arts & Humanities course    3 hrs  
 (ARTS 101, ARTS 310, ARAB 101, ASLS 203, CHIN 101, ENGL 204, ENGL 205, ENGL 206, ENGL 207, FREN 101, HIND 101, HONR 101, JAPN 101, KORE 101, PORT 101, SPAN 101, THAR 101)  
 ENGL 203 Fundamentals of Contemporary Speech    3 hrs

##### Curriculum Area 2    6 Credit Hours required

Elective Social & Behavioral Sciences course    6 hrs  
 (CRJS 101, ECON 201, ECON 202, GEOG 201, GEOG 202, HIST 101, HIST 102, HIST 201, HIST 202, HONR 201, HUEC 203, HUEC 220, HUEC 361, PHIL 201, PHIL 202, POLI 200, POLI 220, POLI 342, PSYC 100, SOCI 101, SOCI 201)

##### Curriculum Area 3    7 Credit Hours Required

CHEM 111/ CHEM 111H Chemistry I    3 hrs [Note: CHEM 111 is the prerequisite for ENME 325 Properties of Materials]  
 PHYS 161/ PHYS 181H General Physics I    3 hrs  
 PHYS 163/ PHYS 183H General Physics Lab I    1 hr

##### Curriculum Area 4    4 Credit Hours Required

MATH 112 Calculus I    4 hrs

##### Curriculum Area 5    9 Credit Hours Required

ENGL 101/ ENGL 101H Basic Composition I    3 hrs  
 ENGL 102/ ENGL 102H Basic Composition II    3 hrs  
 ENGL 305/ENGL 305H Technical Writing    3 hrs                      OR                      ENGL 310/ENGL 310H Advanced Composition                      3hrs

##### Curriculum Area 6    7 Credit Hours Required

ENGE 100 First Year Orientations with Engineering    1 hr  
 Elective Computer Literacy course    3 hrs  
 (BUAD 213, BUED 212, EDCI 306, ETGE 110, ETGE 111, ETGE 112)  
 Elective JEDI (Justice, Equity, Diversity, Inclusion) course    3 hrs  
 ( BUAD 311, CRJS 455, DMST 440, EDCI 408, ENGL 348, ENGL 359, EXSC 111, EXSC 265, EXSC 382, HUEC 230, HUEC 463)

#### II. Supportive Science & Math Requirements                      19Credit Hours

MATH 211 Calculus II    4 hrs  
 MATH 212 Calculus III    4 hrs  
 MATH 241 Differential Equations    3 hrs  
 PHYS 262 General Physics II    3 hrs  
 PHYS 264 General Physics Lab II    1 hr  
 PHYS 263 General Physics III    3 hrs  
 PHYS 265 General Physics Lab III    1 hr

**III. Engineering Core Requirements 54 Credit Hours**

ENGE 150 Modern Engineering Design	3 hrs
ENGE 170 Programming Concepts for Engineers	3 hrs
ENGE 240 Basic Circuit Theory	3 hrs
ENGE 241 Analog Circuits Lab	1 hr
ENGE 260 Statics	3 hrs
ENGE 261 Dynamics	3 hrs
ENGE 270 Computer Aided Design	3 hrs
ENGE 320 Statistics & Probability for Engineers	3 hrs
<b>ENME 325 Properties of Materials</b>	<b>3 hrs</b>
ENME 342 Fluid Mechanics	3 hrs
ENME 345 Thermodynamics	3 hrs
ENME 346 Heat Transfer	3 hrs
<b>ENME 347 Thermal and Fluid Lab</b>	<b>1 hr</b>
ENGE 362 Mechanics of Materials	3 hrs
<b>ENME 363 Properties and Mechanics of Materials Lab</b>	<b>1 hr</b>
ENGE 370 Computational Methods in Engineering	3 hrs
ENGE 380 Instrumentations	3 hrs
ENGE 382 Control Systems	3 hrs
ENGE 383 Control Lab	1 hr
ENGE 475 Engineering Seminar	1 hr
ENGE 476 Senior Design Project I	2 hrs
ENGE 477 Senior Design Project II	2 hrs

**IV. Engineering Specialization Requirements 8 Credit Hours**

Students will take 2 elective courses plus 1 elective lab from the following courses:

**Mechanical Engineering Electives (ENME)**

ENAE 420 Aerodynamics	3 hrs	ENME 462 Digital Control System	3 hrs
ENME 422 Mechanisms and Machine Design	3 hrs	ENAE 467 Design of Autonomous Aerial Systems	3 hrs
ENME 425 Rapid Prototyping & Product Develop.	3 hrs	ENME 468 Robotics	3 hrs
ENME 430 Finite Element Analysis	3 hrs	<b>ENME 470 Vibrations</b>	<b>3 hrs</b>
ENME 440 Mechatronics	3 hrs	ENME 472 Selected Topic in Mechanical Engineering	3 hrs
ENME 442 Micro Electro-Mechanical Systems	3 hrs	<b>ENME 365 Machine Element Design</b>	<b>3 hrs</b>
ENME 464 Embedded System Design Lab	2 hrs	ENME 469 Robotics and Automation Design Lab	2 hrs

For course description please click on course code or name

RECOMMENDED COURSE SEQUENCE			MAJOR: <b>Mechanical Engineering</b>			<b>TOTAL: 120</b>		
<b>FRESHMAN YEAR</b>								
<b>FIRST SEMESTER</b>				<b>SECOND SEMESTER</b>				
CHEM 111	Chemistry I	3		ENGL 102	Basic Composition II	3		
MATH 112	Calculus I	4		MATH 211	Calculus II	4		
ENGE 150	Modern Engineering Design	3		PHYS 161	General Physics I	3		
ENGL 101	Basic Composition I	3		PHYS 163	General Physics I Lab	1		
ENGE 100	First year Orientation with Engineering	1		ENGE 170	Programming Concepts for Engineers	3		
					General Edu (Arts and Humanities)	3		
<b>TOTAL</b>		14		<b>TOTAL</b>		17		
<b>SOPHOMORE YEAR</b>								
<b>FIRST SEMESTER</b>				<b>SECOND SEMESTER</b>				
MATH 241	Differential Equations	3		PHYS 263	Physics III	3		
PHYS 262	Physics II	3		PHYS 265	Physics III Lab	1		
PHYS 264	Physics II Lab	1		ENGE 240	Basic Circuit Theory	3		
<b>ENME 325</b>	<b>Properties of Materials</b>	<b>3</b>		ENGE 241	Analog Circuits Lab	1		
ENGE 260	Static	3		ENGE 261	Dynamics	3		
ENGL 203	Fundamentals of Contemporary Speech	3		MATH 212	Calculus III	4		
				ENGE 270	Computer Aided Design	3		
<b>TOTAL</b>		16		<b>TOTAL</b>		18		
<b>JUNIOR YEAR</b>								
<b>FIRST SEMESTER</b>				<b>SECOND SEMESTER</b>				
ENGE 370	Computational Methods in Engineering	3		ENME 342	Fluid Mechanics	3		
					<b>ME Elective (442/470)</b>	<b>3</b>		
<b>ENME 363</b>	<b>Properties and Mechanics of Materials Lab</b>	1		ENGE 382	Control Systems	3		
ENGE 362	Mechanics of Materials	3		ENGE 383	Control Lab	1		
ENGE 380	Instrumentations	3		ENGL 305	Technical Writing	3		
ENGE 320	Statistics & Probability for Engineers	3			General Education (Social & behavior 2.1)	3		
<b>TOTAL</b>		13		<b>TOTAL</b>		16		
<b>SENIOR YEAR</b>								
<b>FIRST SEMESTER</b>				<b>SECOND SEMESTER</b>				
ENME 346	Heat Transfer	3			ME Elective (430/440/468)	3		
<b>ENME 347</b>	<b>Thermal and Fluid Lab</b>	<b>1</b>						
ENME 345	Thermodynamics	3		ENGE 477	Senior Design Project II	2		
ENGE 476	Senior Design Project I	2		ENGE 475	Engineering Seminar	1		
	ME Elective Lab (464)	2			General Education (JEDI & Computer)	6		
	General Education (Social & Behavioral 2.2)	3						
<b>TOTAL</b>		14		<b>TOTAL</b>		12		