ENGINEERING MECHANICS: ASTRONAUTICS

REQUIREMENTS

The following curriculum applies to students who entered the College of Engineering after fall 2018.

SUMMARY OF REQUIREMENTS

Code	Title	Credits
Mathematics and Statistics		22
Science		10
Engineering Science		27
Engineering Mechanics/Astronautics Core		40
Technical Electives		5
Communication Skills		8
Liberal Studies		16
Total Credits		**128**

MATHEMATICS AND STATISTICS

Code	Title	Credits
MATH 221	Calculus and Analytic Geometry 1	5
or MATH 217	Calculus with Algebra and Trigonometry II	
or MATH 275		
MATH 222	Calculus and Analytic Geometry 2	4
or MATH 276		
MATH 234	Calculus--Functions of Several Variables	4
MATH 320	Linear Algebra and Differential Equations	3
MATH 321	Applied Mathematical Analysis	3
STAT 324	Introductory Applied Statistics for Engineers	3
Total Credits		**22**

SCIENCE

Code	Title	Credits
Select one of the following:		5-9
CHEM 109	Advanced General Chemistry	
CHEM 103 & CHEM 104	General Chemistry I and General Chemistry II	
PHYSICS 202	General Physics	5
Total Credits		**10-14**

ENGINEERING SCIENCE

Code	Title	Credits
INTEREGR 170	Design Practicum	3
M E 231	Geometric Modeling for Design and Manufacturing	3
E P 271	Engineering Problem Solving I	3
or COMP SCI 200	Programming I	
or COMP SCI 220	Data Science Programming I	
or COMP SCI 310	Problem Solving Using Computers	
M E 361	Thermodynamics	3
M E 363	Fluid Dynamics	3
or CIV ENGR 310	Fluid Mechanics	
E C E 376	Electrical and Electronic Circuits	3
or PHYSICS 321	Electric Circuits and Electronics	
M E 364	Elementary Heat Transfer	3
E C E 332	Feedback Control Systems	3
or M E 346	Introduction to Feedback Control for Mechanical Engineers	
or M E 446	Automatic Controls	
Computing Elective (select one)		3
COMP SCI 300	Programming II	
COMP SCI 412	Introduction to Numerical Methods	
E M A/E P 471	Intermediate Problem Solving for Engineers	
E M A/E P 476	Introduction to Scientific Computing for Engineering Physics	
Total Credits		**27**

ENGINEERING MECHANICS/ASTRONAUTICS CORE

Code	Title	Credits
E M A 201	Statics	3
E M A 202	Dynamics	3
or M E 240	Dynamics	
E M A 303	Mechanics of Materials	3
or M E 306	Mechanics of Materials	
E M A/M E 307	Mechanics of Materials Lab	1
E M A 405	Practicum in Finite Elements	3
E M A 469	Design Problems in Engineering	3
E M A 506	Advanced Mechanics of Materials I	3
Experimental Mechanics Elective (select one)		3
E M A/M E 540	Experimental Vibration and Dynamic System Analysis	
E M A/M E 570	Experimental Mechanics	
E M A 611	Advanced Mechanical Testing of Materials	
E M A 522	Aerodynamics Lab	
E M A 521	Aerodynamics	3
or M E 563	Intermediate Fluid Dynamics	
E M A 542	Advanced Dynamics	3
E M A 545	Mechanical Vibrations	3
E M A 569	Senior Design Project	3
Spacecraft & Structural Dynamics Elective (select one)		3
E M A/ ASTRON 550	Astrodynamics	
E M A 610	Structural Finite Element Model Validation	
E M A 642	Satellite Dynamics	

Aerospace Fluid Mechanics Elective (select one)		3
E M A 523	Flight Dynamics and Control	
E M A 601	Special Topics in Engineering Mechanics (Topic: Rocket Propulsion)	
or E M A 524	Rocket Propulsion	
Total Credits		**40**

TECHNICAL ELECTIVES

Code	Title	Credits
Select five credits at an academic level that requires 2 semesters of calculus or 2 semesters of physics as a prerequisite. E M A 1 may also be used to satisfy this requirement.		5

COMMUNICATION SKILLS

Code	Title	Credits
ENGL 100	Introduction to College Composition	3
or COM ARTS 100	Introduction to Speech Composition	
or LSC 100	Science and Storytelling	
or ESL 118	Academic Writing II	
E P D 275	Technical Presentations	2
INTEREGR 397	Engineering Communication	3
Total Credits		**8**

LIBERAL STUDIES

Code	Title	Credits
College of Engineering Liberal Studies Requirements		
Complete Requirements (http://guide.wisc.edu/undergraduate/engineering/#requirementstext) [1]		16
Total Credits		**16**

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Students must take 16 credits that carry H, S, L, or Z breadth designators. These credits must fulfill the following subrequirements:

1. A minimum of two courses from the same subject area (https://registrar.wisc.edu/subjectareas/) (the description before the course number). At least one of these two courses must be designated as above the elementary level (I, A, or D) in the course listing.
2. A minimum of 6 credits designated as humanities (H, L, or Z in the course listing), and an additional minimum of 3 credits designated as social science (S or Z in the course listing). Foreign language courses count as H credits. Retroactive credits for language courses may not be used to meet the Liberal Studies credit requirement (they can be used for subrequirement 1 above).
3. At least 3 credits in courses designated as ethnic studies (lower case "e" in the course listing). These courses may help satisfy subrequirements 1 and 2 above, but they count only once toward the total required. *Note:* Some courses may have "e" designation but not H, S, L, or Z designation; these courses do not count toward the Liberal Studies requirement.

HONORS IN UNDERGRADUATE RESEARCH

Qualified undergraduates may earn an Honors in Research designation on their transcript and diploma by completing 8 credits of undergraduate honors research, including a senior thesis. Further information is available in the department office.

For information on credit load, adding or dropping courses, course substitutions, pass/fail, auditing courses, dean's honor list, repeating courses, probation, and graduation, see the College of Engineering Official Regulations (http://guide.wisc.edu/undergraduate/engineering/#policiesandregulationstext).