ENGINEERING MECHANICS: AEROSPACE ENGINEERING

REQUIREMENTS

The following curriculum applies to students who entered the College of Engineering beginning in Fall 2023.

SUMMARY OF REQUIREMENTS

Code	Title	Credits
Mathematics and Statistics [1]		22
Science [1]		10
Engineering Science		27
Engineering Mechanics/Aerospace Engineering Core		40
Technical Electives		5
Communication Skills		8
Liberal Studies		16
Total Credits		**128**

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If the Mathematics and Statistics and the Science requirements are fulfilled with fewer than 30 credits combined, additional math/science credits will be needed to meet the math/science auxiliary credit condition.

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
M E 201	Introduction to Mechanical Engineering	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	
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/AEROSPACE ENGINEERING CORE

Code	Title	Credits
E M A 201	Statics (with a grade of C or better)	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 524	Rocket Propulsion	
Total Credits		**40**

TECHNICAL ELECTIVES

Code	Title	Credits
Choose five credits from:		5
E M A 1	Cooperative Education Program (no more than 3 credits)	
Courses numbered 300+ in the CoE except for E P D/ INTEREGR		
Up to 3 credits of independent study such as E M A 599; independent study from other engineering subjects may be approved on an individual basis		
Courses numbered 300+ MATH, PHYSICS, COMP SCI, STAT (except STAT 301), ASTRON, MED PHYS, and CHEM departments		
PHYSICS 205	Modern Physics for Engineers	
or PHYSICS 241	Introduction to Modern Physics	
Students may also propose any class that they feel will benefit their education path with pre-requisite of two physics or calculus classes. For these courses the advisor will review the request and if approved, recommend a DARS substitution.		
Total Credits		**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.

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).

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.