

College of Engineering
Department of Engineering Science and Mechanics
Minor in Engineering Science and Mechanics
For Students Graduating in Calendar Year 2022 and for student date of entry under UG catalog 2020-2021

To obtain a minor in ESM a student must complete 21 credit hours of ESM courses as indicated below.

1. Complete 21 hours of ESM coursework on an A/F basis. A GPA of 2.0 is required in the courses required for the ESM minor.

2. Complete the following courses:

ESM 2104 or ESM 2114	Statics <i>PRE: MATH 1226 CO: MATH 2204</i> or Statics and Structures <i>Co: MATH 2204 or MATH 2204H or MATH 2406H</i>		3
ESM 2204	Mechanics of Deformable Bodies <i>PRE: ESM 2104 or 2114, MATH 2204</i>		3
ESM 2304	Dynamics <i>PRE: ESM 2104 or 2114, MATH 2204 CO: MATH 2214</i>		3
ESM 3054	Mechanical Behavior of Materials <i>PRE: ESM 2204, MSE 2034 OR MSE 2044 OR MSE 3094 OR AOE 3094OR CEE 3684</i>		3

3. Complete one of the following (Fluid Mechanics requirement):

ESM 3234	Fluid Mechanics I-Control Volumes <i>PRE: ESM 2304 PHYS 2306</i>		3
or			
ESM 3024	Introduction to Fluid Mechanics <i>PRE: ESM 2304, MATH 2204</i>		3
or			
ME 3404 †	Fluid Mechanics <i>PRE: ME 2124, MATH 2214</i>		3
or			
CEE 3304 †	Fluid Mechanics for CEE <i>PRE: ESM 2104</i>		3
or			
AOE 3104 †	Aircraft Performance <i>PRE: AOE 2104 OR AOE 2204, ESM 2104, AOE 2074 CO: ESM 2304</i>		3
and			
AOE 3014 †	Naval Architecture <i>PRE: AOE 3104 OR AOE 3204, ESM 2304</i>		3
or			
AOE 3204 †	Ship Hydrodynamics <i>PRE: ESM 2104, MATH 2204, AOE 2104 OR AOE 2204, AOE 2074 CO: ESM 2304</i>		3
and			
AOE 3014 †	Aero/Hydrodynamics <i>PRE: AOE 3104 OR AOE 3204, ESM 2304</i>		3

4. Complete six hours from the following list. At least 3 hours must be 4xxx or above.

ESM 3034	Fluid Mechanics Laboratory <i>PRE: ESM 2304, ECE 3054 CO: ESM 3234</i>		1
ESM 3064	Mechanical Behavior of Materials Lab <i>PRE: ESM 2204 CO: ESM 3054</i>		1
ESM 3124	Dynamics II-Analytical & 3D Motion <i>PRE: ESM 2304, MATH 2214, MATH 2204</i>		3
ESM 3134	Dynamics III-Vibration and Control <i>PRE: ESM 3124, MATH 4564</i>		3
ESM 3154	Solid Mechanics <i>PRE: ESM 2204, MATH 2214 CO: MATH 4574</i>		3
ESM 3334	Fluid Mechanics II-Differential Analysis <i>PRE: ESM 3434 CO: MATH 4574</i>		3
ESM 3444	Mechanics Laboratory <i>PRE: ESM 3234, ESM 3034, ESM 3054, ESM 3064, ESM 3124, ECE 3054 CO: ESM 3134, ESM 3154, ESM 3334</i>		2
ESM 4014	Applied Fluid Mechanics		3
ESM 4024	Advanced Mechanical Behavior of Materials <i>PRE: ESM/MSE 3054</i>		3
ESM 4044	Mechanics of Composite Materials <i>PRE: ESM 2204</i>		3
ESM 4084/AOE 4084	Engineering Design Optimization <i>PRE: MATH 2204</i>		3
ESM 4105	Engineering Analysis of Physiologic Systems		3
ESM 4106	Engineering Analysis of Physiologic Systems		3
ESM 4114	Nonlinear Dynamics and Chaos <i>PRE: ESM 2304 or PHYS 2504, MATH 2214</i>		3
ESM 4204	Musculoskeletal Biomechanics and Biologic Control		3
ESM 4224	Biodynamics & Control		3
ESM 4234	Mechanics of Biological Materials and Structures		3
ESM 4245	Mechanics of Animal Locomotion <i>PRE: ESM 3054</i>		3
ESM 4246	Mechanics of Animal Locomotion <i>PRE: ESM 3234</i>		3
ESM 4304	Hemodynamics		3
ESM 4614	Probability-Based Modeling, Analysis, and Assessment <i>PRE: ESM 2204</i>		3
ESM 4734/AOE 4024	Introduction to Finite Elements		3
ESM 5405 or 5406	Clinical Internship in Biomedical Engineering		3

5. Students completing the minor must obey all prerequisite rules. Some courses above may have additional prerequisites not required for the minor.

† Students taking a non-ESM course for this minor requirement must take an additional 3 credit hours of ESM coursework from #4.