

Department of Mechanical Science and Engineering

Secondary Field Options in Engineering Mechanics

The seven secondary field options listed below specify required courses and provide a list of approved courses from which the student may choose two. You may also fashion an individualized secondary field option with approval of your adviser and the department's Associate Head for Undergraduate Programs; the only requirements are that the courses be related to mechanics, form a coherent group, include at least two engineering course, and total at least 12 hours that are distinct from required coursework on the Engineering Mechanics flow sheet. At least two courses (6 cr.) must be 400-level and no more than two courses (6 cr.) should be at the 300-level.

<i>Secondary field</i>	<i>Required courses</i>	<i>Approved courses</i>
Biomechanics	MCB 150 —Molecular and cellular basis of life MCB 151 —Molecular and cellular laboratory TAM 461 —Cellular biomechanics	ECE 473/TAM 413 —Fund of engineering acoustics ECE 380/BIOE 380 —Biomedical imaging ME 481 —Whole-body musculoskeletal biomechanics ME 482 —Musculoskeletal tissue mechanics ME 483 —Mechanobiology BIOP 401 —Introduction to biophysics TAM 499 —Senior thesis
Computational Mechanics	CS 357 —Numerical methods I ME 471 —Finite element analysis	CS 450 —Introduction to numerical analysis CS 457 —Numerical methods II ME 412* —Numerical thermo-fluid mechanics TAM 499 —Senior thesis
Engineering Science and Applied Mathematics	MATH 446 —Applied complex variables or MATH 448 —Complex variables MATH 4xx (excluding MATH 415, MATH 441, and MATH 442)	<i>Note: For this secondary field, at least two of the Approved courses must be an Engineering course</i> AE 353 —Aerospace control systems AE 402 —Orbital mechanics CEE 491 —Decision and risk analysis ECE 329 —Introduction to electromagnetic fields ECE 330 —Power circuits and electro-mechanics ECE 473/TAM 413 —Fundamentals of engineering acoustics MATH 423 —Differential geometry MATH 447 —Real variables MATH 482 —Linear programming MATH 484 —Nonlinear programming MATH 488 —Mathematical methods in engineering MATH 489 —Dynamics & differential equations MATH 490 —Advanced topics in mathematics PHYS 402 —Light STAT 400/MATH 463 —Statistics and probability I STAT 410/MATH 464 —Statistics and probability II TAM 499 —Senior thesis
Experimental Mechanics	TAM 456 —Experimental stress analysis ECE 206 —Electric and electronic circuits laboratory	CS 357 —Numerical methods ECE 473/TAM 413 —Fund of engineering acoustics ME 360* —Signal processing PHYS 402 —Light TAM 499 —Senior thesis

Continued on next page

Department of Mechanical Science and Engineering

<p>Fluid Mechanics</p>	<p>TAM 435—Intermediate fluid mechanics ME 410—Intermediate gas dynamics</p>	<p>AE 412—Viscous flow and heat transfer CEE 445—Air quality modeling CEE 451—Environmental fluid mechanics CEE 453—Urban hydrology and hydraulics ECE 473/TAM 413—Fund of engineering acoustics ME 412*—Numerical thermo-fluid mechanics TAM 499—Senior thesis</p>
<p>Mechanics of Materials</p>	<p>TAM 424—Mechanics of structural metals TAM 427/AE 427—Mechanics of polymers <i>or</i> TAM 428/MSE 456/AE 428—Mechanics of composites</p>	<p>CEE 310—Transportation engineering MSE 401—Thermodynamics of materials MSE 489—Materials selection for sustainability NPRE 431—Materials in nuclear engineering TAM 499—Senior thesis</p>
<p>Solid Mechanics</p>	<p>TAM 424—Mechanics of structural metals TAM 451—Intermediate solid mechanics</p>	<p>CEE 360—Structural engineering CEE 460—Steel structures I CEE 461—Reinforced concrete I CS 357—Numerical methods ECE 473/TAM 413—Fund of engineering acoustics TAM 499—Senior thesis</p>

*Engineering Mechanics students will not necessarily have completed the stated prerequisites for these courses. However, EM students normally have sufficient preparation to enroll, with the instructor's permission.