E SC Foundational Electives

The intent of the Foundational Elective (FE) courses is to provide some flexibility in the junior year while maintaining a high level of technical content (i.e., not intro/overview courses), providing breadth of topics covered, and supporting potential deeper study in the senior year.

A total of five FE courses are required. Some courses on these lists are suitable as Technical Electives, but each course can be used to fill one degree requirement. *No more than one 100-level course may be used.*

Core (select 3–5 courses)

- CHEM 112 (Chemical Principles II)
- AERSP 308H (Mechanics of Fluids)
- E MCH 416H (Failure and Failure Analysis of Solids)
- E SC 400H (Electromagnetic Fields)
- E SC 419 (Electronic Properties and Applications of Materials)

The following are acceptable core subtitutions:

- AERSP 308H ➡ AERSP 311, BME 409, CH E 330H, C E 360, EME 303, or M E 320
- E SC 419 ➡ E SC 314
- E SC 400H ➡ E E 330 or PHYS 400

Alternative (select 0–2 courses)

- AERSP 301 (Aerospace Structures)
- AERSP 304 (Dynamics & Control of Aerospace Systems)
- AERSP 309 (Astronautics)
- AERSP 312 (Aerodynamics II)
- A E 311 (Fundamentals of Electrical and illumination Systems for Building)
- B E 300 (Biological Systems)
- B E 302 (Transport Processes for B E)
- B E 304 (Engineering Properties of Food and Biological Materials)
- B E 306 (Machines for Agricultural & Biological Processing)
- B M B 251 (Molecular and Cell Biology I)
- BME 201 (Cell and Molecular Bioengineering)
- BME 301 (Analysis of Physiological Systems)
- BME 303 (Bio-continuum Mechanics)
- BIOL 110 (Biology: Basic Concepts and Biodiversity)
- BIOL 141 (Introductory Physiology)
- BIOL 230M (Molecules and Cells)
- BIOL 240M (Function and Development of Organisms)
- C E 340 (Structural Analysis)
- C E 335 (Engineering Mechanics of Soils)
- C E 370 (Introductions to Environmental Engineering)
- CH E 210H (Introduction to Material Balances)
- CH E 320H (Phase and Chemical Equilibria)
- CHEM 210 (Organic Chemistry)
- CMPEN 270 (Digital Design: Theory and Practice)
- CMPEN 331 (Computer Organization and Design)
- CMPSC 122 (Intermediate Programming)
- CMPSC 221 (Object Oriented Programming with Web-Based Applications)
- CMPSC 311 (Introduction to Systems Programming)
- CMPSC 312 (Computer Organization and Architecture)
- CMPSC 360 (Discrete Mathematics for Computer Science)
- E E 310 (Electronic Circuit Design 1)
- E E 320 (Introduction to Electro-Optical Engineering)
- E E 340 Introduction to Nanoelectronics)
- E E 350 (Continuous-Time Linear Systems)
- E SC 313 (Intro to Principles, Fabrication Methods, and Appl. of Nanotechnology)
- E SC 3xx (Physical Principles of Living Organisms)
- E SC 4xx (Multidisciplinary Design Project)
- EGEE 302 (Principals of Energy Engineering)
- EGEE 304 Heat and mass Transfer)
- ENGR 320 (Materials Properties Measurement I)
- I E 305 (Product Design, Specification & Measurement)
- I E 311 (Principles of Solidification Processing)
- I E 312 (Product Design and Manufacturing Processes)
- I E 322H (Probabilistic Models in I E)
- I E 323 (Statistical Methods in I E)
- I E 327 (Introduction to Work Design)
- I E 330 (Information Technology for I E)
- M E 360 (Mechanical Design)
- M E 367 (Machine Design)
- M E 370 (Vibration of Mechanical Systems)
- M E 380 (Machine Dynamics)
- MATH 311M (Concepts of Discrete Mathematics)
- MATH 315 (Foundations of Mathematics)
- MATSE 400 (Crystal Chemistry)
- MATSE 402 (Materials Process Kinetics)
- MATSE 443 (Introduction to the Materials Science of Polymers)
- METEO 300 (Fundamentals of Atmospheric Science)
- NUC E 301 (Fundamentals of Reactor Physics)
- NUC E 309 (Analytical Techniques for Nuclear Concept)