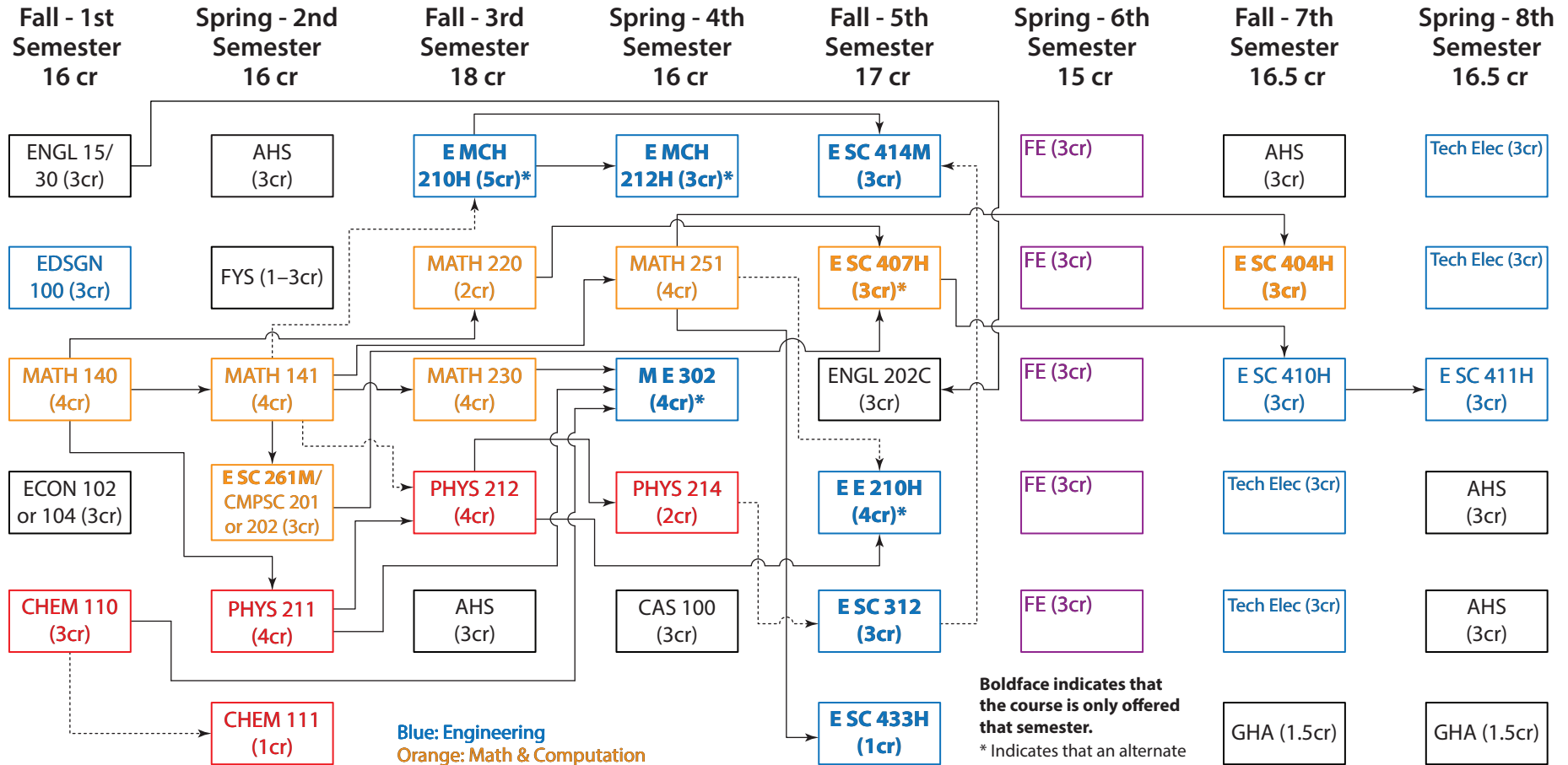


Student: \_\_\_\_\_

# ENGINEERING SCIENCE

Advising Flowchart & Checksheet



**Boldface indicates that the course is only offered that semester.**  
 \* Indicates that an alternate course is available the other semester.

→ Prerequisite  
 - - - - - Prerequisite or Concurrent

**Blue: Engineering**  
**Orange: Math & Computation**  
**Red: Science**  
**Purple: See FE List**  
**Black: General Education**

### Foundational Electives (FE) with prerequisites

#### Core (select 3-5 courses)

- CHEM 112 (3cr) [Sp, Fa, Su]  
- CHEM 110
- AERSP 308H (3cr) [Sp]  
- E MCH 212, MATH 251
- E MCH 416H (3cr) [Sp]  
- E MCH 213 or 210
- E SC 400H (3cr) [Sp]  
- E E 210, MATH 250
- E SC 419 (3cr) [Sp]  
- E SC 312

#### Alternative FEs (0-2 courses)

Departmental list contains courses from†  
 AERSP, AE, BE, BMB, BIO E, BIOL, C E,  
 CH E, CHEM, CMPEN, CMPSC, E E, E SC,  
 EGEE, ENGR, I E, M E, MATH, MATSE,  
 METEO, NUC E † others by petition

Arts (GA)	US Cultures (US)
Humanities (GH)	Int'l Cultures (IL)
Social Sciences (GS)	Semester of graduation:

See <http://bulletins.psu.edu/> for course titles and descriptions.

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# 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 substitutions:*

- AERSP 308H → AERSP 311, BIOE 409, CH E 330H, C E 360, EME 303, or M E 320
- E SC 419 → E SC 314
- E SC 400H → E E 340 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)
- BIOE 201 (Cell and Molecular Bioengineering)
- BIOE 301 (Analysis of Physiological Systems)
- BIOE 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 I)
- 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)
- NUCE 301 (Fundamentals of Reactor Physics)
- NUCE 309 (Analytical Techniques for Nuclear Concept)