

Electrical Engineering: Electromagnetics, Optics & Radiating Systems

Sample AB Major in Engineering Sciences

Prerequisites

MATH 3, 8, 13; or MATH 11; PHYS 13, 14; CHEM 5;
ENGS 20 or COSC 1 and 10

Common Core (3 courses)

ENGS 21: Introduction to Engineering*
ENGS 22: Systems
ENGS 23: Distributed Systems and Fields

Distributive Core (2 courses)

ENGS 26: Control Theory*
ENGS 24: Science of Materials

Gateway (2 courses)

ENGS 32: Electronics: Introduction to Linear and
Digital Circuits*
ENGS 34: Fluid Mechanics

Electives (2 courses; 1 may be math or natural science)

ENGS 31: Digital Electronics*
MATH 23: Differential Equations

Culminating Experience: ENGS 86, 88, 89 or one
advanced ENGS course that may also count as 1)
one of the above electives and 2) toward the BE
Math and Natural Science Requirement or the BE
ENGS/ENGG requirement.

Total: Includes 9 or 10 courses through AB

LEGEND

Allowable or potentially allowable in the BE concentration
Math or Natural Science course

Introductory course: Not allowable in the BE concentration

* Significant design content

Capstone Design Experience

BE →

ENGS 89: Engineering Design Methodology and
Project Initiation*
ENGS 90: Engineering Design Methodology and
Project Completion*

Sample BE Program

Math and Natural Science Requirement

9 course credits (minimum) including any
completed for AB major requirements.

PHYS 19: Introductory Physics III

Applied MATH/ENGS Requirement

One of ENGS 91, 92 and 93 must be completed for
the BE and may be counted as either a MATH
course or an ENGS course in fulfilling BE
requirements.

ENGS 92: Fourier Transforms and Complex Variables

ENGS/ENGG Requirement

– 13.5 courses minimum (15.5 is typical), including
courses completed for the AB major, 6 total with
significant design content*. ENGS 20 (or CS 1 + 10)
counts as 0.5 ENGS credit.

– 3-course concentration, 1 with significant design
content*

– ENGS 89 and 90

Engineering Electives: 3-course concentration

Choose 3 from: ENGS 64: Engineering
Electromagnetics; ENGS 120: Electromagnetic Fields
and Waves; ENGS 123: Optics; ENGS 124: Optical
Devices and Systems*

Electives (3 courses; 2 may be math or natural science)

ENGS 27: Discrete and Probabilistic Systems

ENGS 60: Introduction to Solid-State Electronic
Devices*

ENGS 61: Intermediate Electrical Circuits*

ENGS 91: Numerical Methods in Computation

ENGS 100: Methods in Applied Mathematics I

ENGS 122: Semiconductor Theory and Devices

ENGS 125: Power Electronics and Electromechanical
Energy Conversion*

MATH 22: Linear Algebra with Applications

MATH 46: Introduction to Applied Mathematics

PHYS 24: Quantum Physics of Matter: An Introduction

PHYS 66: Relativistic Electrodynamics