Engineering Physics
Sample Curriculum for Electrical and Computer Engineering Specialization

Student Information

Name:_____ OSU Email: _____

Suggested Curriculum

This should be used as a **guide** only. Semester offerings are subject to change.

Year	Autumn	Spring
1	___ Physics 1270[1] *(Into Physics I)* ..... 5 hr ___ Math 1151 *(Calculus I)* ..... 5 hr ___ Engineering 1181 *(Intro Engineering I)* ..... 2 hr ___ Engineering 1100 *(Engineering Survey)* ..... 1 hr ___ Writing & Info Literacy GE ..... 3 hr	___ Physics 1271[1] *(Intro Physics II)* ..... 5 hr ___ Math 1172 (*Eng Mathematics A)* ..... 5 hr ___ Engineering 1182 *(Intro Engineering II)* ..... 2 hr ___ CSE 1222 *(C++ Programming)* ..... 3 hr ___ GenEd 1201[3] ..... 1 hr
2	___ Physics 2300 *(Mechanics I)* ..... 4 hr ___ **Physics 2095** *(Physics Seminar)* ..... 1 hr ___ Math 2173 *(Eng Mathematics B)* ..... 3 hr ___ ECE 2020 *(Intro to Analog Systms & Circuits)* ..... 3 hr ___ ECE 2060 *(Intro to Digital Logic)* ..... 3 hr ___ Literary, Visual and Performing Arts GE ..... 3 hr	___ Physics 2301 *(Mechanics II)* ..... 4 hr ___ Math 2415 *(Differential Equations)* ..... 3 hr ___ Math 2568 *(Linear Algebra)* ..... 3 hr ___ ECE 2050 *(Intro to Discrete Time Signals/Sysm)* ..... 3 hr ___ Social and Behavioral Sciences GE ..... 3 hr
3	___ **Physics 5500** *(Quantum Mechanics)* ..... 4 hr ___ ECE Elective ..... 3 hr ___ ECE Elective ..... 3 hr ___ Physics 3700 *(Data Analysis Lab)* ..... 3 hr ___ Thematic Pathways #1[7] ..... 3 hr	___ **Physics 5400** *(Electromagnetism)* ..... 4 hr ___ Physics 4700 *(Electronics Lab)* ..... 3 hr ___ ECE Elective ..... 3 hr ___ Historical and Cultural Studies GE ..... 3 hr ___ Race, Ethnicity, Gender Diversity GE ..... 3 hr
4	___ **Physics 5800** *(Eng Phy Capstone I)* ..... 3 hr ___ ECE Elective ..... 3 hr ___ ECE Elective ..... 3 hr ___ Targeted Elective[6] ..... 3 hr ___ Thematic Pathways[7] #2 ..... 3 hr ___ Thematic Pathways[7] #3 ..... 3 hr	___ **Physics 5801** *(Eng Phy Capstone II)* ..... 3 hr ___ ECE Elective ..... 3 hr ___ Targeted Elective[6] ..... 3 hr ___ Physics Elective[5] ..... 4 hr ___ Thematic Pathways[7] #4 ..... 3 hr

Total Hours to complete the degree program = 131

[1] Students can take Physics 1250-1251, 1250H-1251H, 1260-1261, or 1270-1271

[3] GenEd 1201 must be taken within the first three semesters

[5] Physics Elective options are Physics 3470, 5300, 5401H, 5501, 5600, 5680, and 5810

[6] A list of Targeted Electives options is available at go.osu.edu/targeted-electives. Note: since students pursuing the ECE specialization take Math 2415+2568 instead of 2174, the additional math course is counting as 3 hours toward the Targeted Elective requirement, leaving 6 hours remaining.

[7] The requirement is to take either two 3-credit hour classes or one 4-credit hour class for each of the two GE Theme categories

Courses printed in **bold** are taught only during the term shown.

Engineering Specializations

Engineering Physics students are required to take at least 27 hours from one of the following engineering specializations. Note: this document outlines the requirements for the **Electrical and Computer Engineering** (ECE) specialization.

Aerospace Engineering
Chemical & Biomolecular Engineering
Computer Science & Engineering
Electrical and Computer Engineering
Industrial & Systems Engineering
Materials Science & Engineering
Mechanical Engineering
Nuclear Engineering

Requirements for each specialization can be found at https://physics.osu.edu/engineering-physics-program/concentration-requirements

Electrical and Computer Engineering Specialization

Required courses (9 hours)

Course	Course title	Credits	Term	Prerequisites
ECE 2020	Intro to Analog Systems and Circuits	3	Au, Sp	(Math 1152 or 1172 or 1181H); and (Physics 1250, 1260, or 1270)
ECE 2050	Intro to Discrete Time Signals & Systems	3	Au, Sp	ECE 2060; and CSE 1222. Prereq or concur: Math 2568
ECE 2060	Intro to Digital Logic	3	Au, Sp	None

Electives courses (choose 18 hours)

Course	Course title	Credits	Term	Prerequisites
ECE 2300	Electrical Circuits and Electronic Devices	3	Au, Sp	(Physics 1251 or 1261 or 1271) and (Math 1172, 2153, 2182H, or 4182H)
ECE 2560	Intro to Microcontroller-Based Systems	2	Au, Sp	ECE 2060; pre-req or concurrent: CSE 1222 or ENGR 1281H
ECE 3010	Intro to Radio Frequency & Optical Engineering	3	Au, Sp	ECE 2020; and (Physics 1251, 1261, or 1271); and (Math 2415 or 2174)
ECE 3020	Introduction to Electronics	3	Au, Sp	ECE 2020
ECE 3027	Electronics Laboratory	1	Au, Sp	ECE 3020
ECE 3030	Semiconductor Electronic Devices	3	Au, Sp	(Physics 1251, 1261, or 1271); and (Chemistry 1210 or 1250); pre-req or concur: Math 2415 or 2174
ECE 3040	Sustainable Energy and Power Systems I	3	Au, Sp	ECE 2020
ECE 3047	Sustainable Energy and Energy Conversion Lab	1	Au, Sp	ECE 3040
ECE 3050	Signals and Systems	3	Au, Sp	ECE 2020, 2050, and 2060; and Math 2568

ECE 3551	Intro to Feedback Control Systms	3	Au, Sp	ECE 3050
ECE 3561	Advanced Digital Design	3	Au, Sp	ECE 2060; pre-req or concur: ECE 3020
ECE 3567	Microcontroller Lab	2	Au, Sp	ECE 2560
ECE 4021	Analog Integrated Circuits I	3	Au	ECE 3020
ECE 5010	Wireless Propagation and Remote Sensing	3	Au	ECE 3010
ECE 5012	Integrated Optics	3	Sp	ECE 3010
ECE 5013	Intro to Radar Systems	3	Sp	ECE 3050; and ECE 3010; and Statistics 3470
ECE 5020	Mixed Signal VLSI	3	Au	ECE 3020
ECE 5021	Analog Integrated Circuits II	3	Sp	ECE 4021
ECE 5022	Intro to RF Systems	3	Au	ECE 4021
ECE 5025	Power Electronics: Devices, Circuits, and Applications	3	Au	ECE 3020
ECE 5027	Microwave Electronics	4	Sp	ECE 3020
ECE 5031	Semiconductor Process Tech.	3	Sp	ECE 3030
ECE 5033	Surfaces and Interfaces of Electronics Materials	3	Au	ECE 3030
ECE 5037	Solid State Electronics and Photonics Laboratory	4	Au	Prereq or concur: ECE 3030
ECE 5041	Electric Machines	3	Sp	ECE 3020 and 3040
ECE 5042	Power Systems	3	Au	ECE 3040
ECE 5050	Humanitarian Engineering	4	Sp	Engineering 1182 or 1282H
ECE 5078	Empowering the Entrepreneurial Electrical and Computer Engineer	3	Sp	Prereq or concurrent: ECE 3010, 3020, 3030, 3040, or 3050
ECE 5101	Intro to Wireless Networking	3	Sp	ECE 3561 and (Statistics 2450 or 3470)
ECE 5131	Lasers	3	Au	ECE 3010 or 3030
ECE 5227	Fundamentals of Power Mngmt Integrated Circuits for VLSI Sysm	4	Sp	ECE 4021
ECE 5244	Si and Wade Band Gap Power Devices	3	Au	ECE 3030
ECE 5326	Computer Architecture & Design	3	Au, Sp	ECE 2560 and 3561
ECE 5400	Instrumentation, Signals, and Control in Transport. Applications	3	Varies	ECE 2020 and 2050; and Math 2415
ECE 5460	Image Processing	3	Au	Statistics 3470 and Math 2568
ECE 5463	Introduction to Real Time Robotics Systems	3	Au, Sp	Math 2174 or (Math 2415 and 2568); and (Physics 1250, 1260, or 1270); and (CSE 1222, ENGR 1181, ENGR 1281H, or ENGR 1222)

ECE 5466	Embedded Computer Systems	3	Sp	ECE 5362
ECE 5530	Fund. of Semiconductors for Microelectronics and Photonics	3	Au	ECE 3030
ECE 5537	Semiconductor Device Characterization and Modelling Lab	4	Sp	ECE 3030
ECE 5551	State-Space Control Systems	3	Au	ECE 3050 and Statistics 3470
ECE 5553	Autonomy in Vehicles	3	Sp	ECE 3551
ECE 5554	Powertrain Control Systems	3	Sp	ECE 3551
ECE 5561	Intro to Cybersecurity	3	Au, Sp	Junior (rank 3) standing or above
ECE 5832	Photovoltaics & Energy Convers.	3	Au	ECE 3030
ECE 5833	Organic and Printed Flexible Electronics	3	Sp	ECE 3030

General Education Requirement

A list of approved general education courses can be found at advising.engineering.osu.edu/current-students/curriculum/general-education