

# **Electrical and Computer Engineering Undergraduate Advising Handbook for ECE Undergraduate Students<sup>1</sup>**

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<sup>1</sup>Revision Date: July 14, 2021

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## Introduction<sup>1</sup>

The School of Electrical and Computer Engineering (ECE) has compiled this advising handbook for undergraduate students to assist them with the selection of their courses and to help them complete their degree in a timely and orderly fashion. This handbook is not intended to replace or supersede the official degree sheets for the Bachelor of Science (BS) in Electrical Engineering (BSEE) or the BS in Computer Engineering (BSCpE) degree programs. The student is expected to meet all requirements listed on the official Degree Requirement Sheet corresponding to the year of matriculation. Per the University Catalog: **“The responsibility for satisfying all requirements for a degree rests with the student. Advisers, faculty members and administrators offer help to the student in meeting this responsibility.”**

Upon admission into ECE as either a new student or transfer student, a student is assigned an Academic Staff Adviser. That adviser will assist students with course selections, prerequisite compliance, degree audit, graduation requirements, and other nuances associated with the ECE programs. Once enrolled in ECEN 3714, Network Analysis, the student will also be assigned an ECE Faculty Adviser. Students are strongly encouraged to discuss with their faculty adviser all aspects of the ECE curriculum and inquire about the career and technologies of electrical engineering or computer engineering. The faculty adviser assignment can be found using Banner (<https://my.okstate.edu>).

Many lower division ECE courses have rigorous “C or better” prerequisites. For example, a “C” or better grade in ECEN 2714, MATH 2233, and PHYS 2114 is required to be enrolled in ECEN 3714. Students who do not satisfy such prerequisites will not be allowed to enroll in the intended course (e.g., ECEN 3714) or stay enrolled if they “slip” through the enrollment system. Students are strongly encouraged to review course listings in the *OSU General Catalog* to be fully informed about any course and its prerequisites.

Transfer students are encouraged to discuss previously completed courses taken at a non-OSU university with their academic adviser. Transferable courses are determined on a case-by-case basis unless an articulation agreement has been established between OSU and the non-OSU university. Students who wish to transfer a course as an equivalent ECEN course must have earned a “C” or better in that course and taken it from an ABET (or equivalent) accredited institution. In most cases, the School does not accept engineering technology courses.

Students pursuing the BS degree in Electrical Engineering are required prior to graduation to have taken a set of area courses in a single sub-discipline in ECE. Sub-disciplines include a) communications (Com), control systems, and digital signal processing (DSP), b) electric power and energy, c) computer and digital, d) electronics and solid state, and e) microwaves and

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<sup>1</sup> Revised July 14, 2021

photonics. The set of area courses is listed in this handbook and includes one 3000 level course and three 4000 level courses. Students are encouraged to select an area that is closely aligned with their career goals. ECE faculty can provide advice about the alignment of career goals with any given area. To facilitate a conversation between BSEE students and faculty, the following list provides a brief overview of each area:

- Communications: wireless technologies, internet, information theory, data networks, encryption, security, digital and analog modulation, encoding and decoding, noise, telecommunications, GPS
- Control Systems: Robotics, mechatronics, autonomous vehicles, embedded control, feedback, compensation, stability, neural networks, optimization, intelligent systems
- Digital Signal Processing: Machine vision, pattern and voice recognition, speech synthesis, video and image processing, digital filters, analog/digital interfaces, data mining, graphical processors
- Power and Energy: Generation, transmission, electric machines, protection, smart and micro-grids, power electronics, electric drives, electro-mechanical transducers, sustainability, renewable energy, energy storage, reliability, batteries, energy conversion and transformation
- Computers and Digital: Computer architectures, VLSI design, central and graphical processing units, networking, memory and storage devices, software engineering and coding, embedded controllers, computer arithmetic, internet-of-things, sequential and combinational logic, peripherals
- Electronics and Solid State: Transistors, diodes, semiconductors, microelectronics, transmitters, receivers, amplifiers, mixers, detectors, regulators, mixed-signal devices, filters, operational amplifiers, oscillators, instrumentation, high speed and low power devices, systems-on-a-chip
- Microwaves and Photonics: Radar, lasers, LIDAR, antennas, wireless transmission, fiber optics, THz communications, medical diagnostics and surgery, beamforming, wave scattering, electromagnetic interference, lumped and distributed circuits, optoelectronics, holography, LED's, photodetectors, imaging systems, spectroscopy

Students pursuing the BS degree in Computer Engineering are by default taking a set of area courses in Computers and Digital along with additional topics in computer science, including discrete mathematics, programming, data structures, and operating systems. Computer Engineering students have the opportunity to enroll in the Software Engineering Option. This option adds three credit hours to the BSCpE degree program and specifies a total of 12 credit hours of software-specific courses that need to be taken.

Students also have the option to pursue a dual degree in electrical engineering and computer engineering. This dual degree program requires 137 credit hours to complete (i.e., 12 credit hours

beyond the BSCpE program). In principle, it can be completed in four years by taking approximately 17 credit hours each semester.

In addition to the dual degree program, the School also offers a “4+1” program that combines the BSEE or BSCpE program with the School’s Master of Engineering in Electrical Engineering (MEngEE) program. Effectively, this program adds 24 credit hours of graduate courses to the BSEE/BSCpE programs to obtain a BSEE/BSCpE degree and MEngEE degree, thus suggesting that the program requires four years to complete the BSEE/BSCpE degree and one year to complete the MEngEE degree (i.e., “4+1”). Specific details of the “4+1” program can be found on the web in the “Memorandum to Graduate Students”; see <https://ece.okstate.edu/>.

Students are highly encouraged to discuss the software engineering option, dual, and “4+1” programs with their faculty and school advisers. These value-added programs have been devised to provide students a competitive edge in the workforce by giving them broader and deeper knowledge of the electrical and computer engineering disciplines.

Course advising sheets for the BSEE program, BSCpE program, and the dual degree program are available in this Handbook. Flow charts are also provided to show how these programs can be potentially completed in four years.

This handbook also lists the 2000, 3000, and 4000 level courses offered by the School along with their corresponding course catalog entries. In most cases, the ECEN course numbering scheme adheres to the following algorithm: ECEN ABXY:

- A = 1 → Freshman Course
- A = 2 → Sophomore Course
- A = 3 → Junior Course
- A = 4 → Senior Course
- A = 5 → Graduate Course
- A = 6 → PhD Course
- B = 1 → Power and Energy
- B = 2 → Computers and Digital Electronics
- B = 3 → Analog Electronics and Solid State
- B = 4 → Control Systems
- B = 5 → Communications
- B = 6 → Microwaves and Electromagnetics
- B = 7 → Signal Processing
- B = 8 → Photonics
- X = 1,2,...,9 for any given course in an area
- Y = Number of credit hours (CH)

For example, ECEN 4613 is a three credit hour, senior level course in the area of microwaves.

A list of the ECE faculty is provided in this handbook along with their general area of specialization. In general, all faculty will be able to advise any undergraduate student, irrespective of the area of specialization selected by the student. However, students are encouraged to contact any faculty member to get detailed information about any area.

## Electrical Engineering (124 CH): Course Advising Sheet<sup>1</sup>

### I. Required Courses (91 CH):

- ENGL 1113, POLS 1113, HIST 1103, ENGL 3323
- ENGR 1111, ENSC 2113, ENSC 2611, IEM 3503
- CS1113, CS 2433
- MATH 2144, MATH 2153, MATH 2233, MATH 2163, MATH 3013
- CHEM 1414, PHYS 2014, PHYS 2114
- ECEN 2714, ECEN 3213, ECEN 3233, ECEN 3314, ECEN 3513, ECEN 3613, ECEN 3714, ECEN 3903, ECEN 4013, ECEN 4024, ECEN 4503

II. EE Area Requirement (12 CH): Choose a set of area courses from columns A, B, C, D, or, E in the table below. (Substitutions may be allowed under extenuating circumstances with ECE approval.)

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
	<b>Com/Controls/ DSP</b>	<b>Power/Energy</b>	<b>Computer/ Digital</b>	<b>Electronics/ Solid State</b>	<b>Microwaves/ Photonics</b>
<b>EE Area Req. 1</b>	ECEN 3723	ECEN 3723 or ECEN 3913	ECEN 3723 or ECEN 3913	ECEN 3913	ECEN 3913
<b>EE Area Req. 2</b>	ECEN 4413	ECEN 3113	ECEN 4213	ECEN 4313	ECEN 3623
<b>EE Area Req. 3</b>	ECEN 4523 or ECEN 4533	ECEN 4133	ECEN 4243	ECEN 4353	ECEN 4613 or ECEN 4823
<b>EE Area Req. 4</b>	ECEN 4763	ECEN 4153	ECEN 4303	ECEN 4613	ECEN 4353 or ECEN 4843

III. EE Breadth Requirement (9 CH): Choose three ECEN 4000 level courses. Exclusions or with ECE approval: ECEN 4010, ECEN 4030. (Other courses, 3000 level or above, in engineering, engineering science, math, physics, chemistry, computer science, or statistics may be allowed with ECE approval.)

IV. Controlled Elective (3 CH): Choose a) ENSC 2123, ENSC 2143, ENSC 2213, ENSC 3233, or ENSC 3313, or b) any course, 3000 level or above from ECEN, BAE, MAE, CIVE, IEM, PHYS, MATH, CHEM, STAT, or CS. Exclusions or with ECE approval (and in some cases, approval from other departments):

- All ENGR Courses
- ECEN 3020, ECEN 4030

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<sup>1</sup> Revision Date: July 14, 2021

- BAE 4001, BAE 4012, BAE 4400
- CHEM 4990
- CIVE 4010, CIVE 4041, CIVE 4043
- CS 3570, CS 4570, CS 4993
- IEM 4010, IEM 4020, IEM 4913, IEM 4931
- MAE 4010, MAE 4342, MAE 4344, MAE 4353, MAE 4354, MAE 4363, MAE 4374
- MATH 3403, MATH 3603, MATH 3910, MATH 3933, MATH 4033, MATH 4590, MATH 4900, MATH 4910
- PHYS 4010, PHYS 4712, PHYS 4993
- STAT 4053, STAT 4063, STAT 4910, STAT 4981, STAT 4991, STAT 4993

V. Humanities, Social Science, International, & Diversity Electives (9 CH): A total of at least 6 credits designated as “H” and 3 credits designated as “S” is required. Of these, 3 CH must meet the International Dimensions “I” component and 3 CH must meet the Diversity “D” component.



Semester 1  
15 Credit Hours

CS 1113  
Comp. Science I  
2/2

ENGR 1111  
Intro to Engr  
1/1

CHEM 1414  
Gen Chemistry  
3/2, Note 1

MATH 2144  
Calculus I  
4/0

ENGL 1113  
Freshman Comp I  
3/0, Note 2

CS2433

MATH2153  
ENSC2113  
PHYS2014

ENGL3323

Semester 2  
16 Credit Hours

CS 2433  
C/C++ Prog  
3/0

PHYS 2014  
General Physics I  
3/2, Note 6

ECEN 3233  
Digital Logic Des  
2/2

MATH 2153  
Calculus II  
3/0

POLS 1113  
American Gov't  
3/0

ECEN3213

PHYS2114  
ENSC2113

ECEN4013

MATH2233  
MATH3013  
ECEN2714  
IEM3503  
MATH2163

Semester 3  
15 Credit Hours

MATH 2233  
Diff Equations  
3/0

PHYS 2114  
General Physics II  
3/2, Note 6

ECEN 2714  
Fund Elec Circuits  
3/2, Note 4,5

ENSC 2113  
Statics  
3/0

ENSC 2611  
Elec Fab Lab  
0/2

ECEN3714

ECEN3714  
ECEN3903

ECEN3714

ECEN3314

Semester 4  
16 Credit Hours

MATH 2163  
Calculus III  
3/0

ECEN 3903  
Intro Semicon Dev  
3/0

ECEN 3714  
Network Analysis  
3/2

ECEN 3213  
Comp Based Systems  
2/2, Note 8

HIST 1103  
American History  
3/0

ECEN3613

ECEN3314

ECEN3314  
ECEN3513  
ECEN3613  
ECEN4013

ECEN4013

Course Number  
Course Name

Lecture/Lab  
See Note #

Subsequent Requirement\*\*

\*Only the last prerequisite in a sequence is listed. All earlier prerequisites must also be satisfied before taking the course.

\*\*See your Advisor, the ECE Advising Document, and Banner for additional information.

Prerequisites\*

OSU Requirement

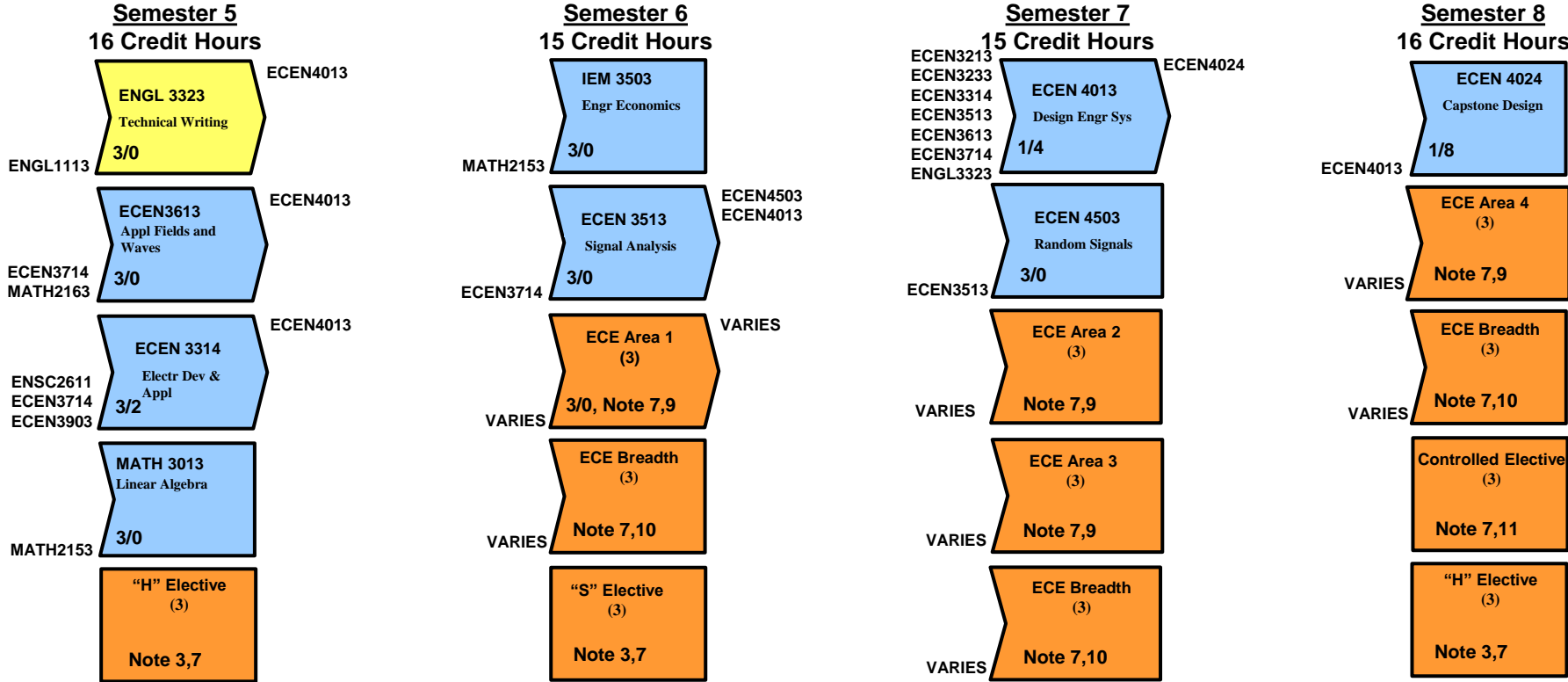
CEAT Requirement

ECE Requirement

Elective

**Suggested Course Plan**  
The anticipation at OSU and most institutions of higher education is that for one semester credit hour (SCH) the student spends one hour per week in lecture (two for lab courses) and two hours studying outside of class (one for lab courses). A three credit hour class requires about nine hours per week. This study plan is recommended for students who will devote full time to university studies and do not have excessive extracurricular activities or other obligations.

- NOTES:**
- 1) CHEM 1515 may be substituted for CHEM 1414 and should be taken by all students considering medical school.
  - 2) Students with less than a "B" in ENGL 1113 or 1313 must take ENGL 1213 or 1413 prior to ENGL 3323.
  - 3) A total of at least 6 hours designated "H" and 3 hours designated "S" is required. Of these, 3 hrs must meet the International Dimension "I" component and 3 hrs must meet the Diversity "D" component.
  - 4) ECEN 2714 replaces ENSC 2613 effective fall 2018.
  - 5) MATH 2233 and PHYS 2114 must be taken prior to or at the same time as ECEN 2714.
  - 6) General Physics I and II are key prerequisites and should be taken at the earliest possible time.
  - 7) Must be at least 3 SCH.
  - 8) ECEN 3213 replaces ENSC 3213.
  - 9) 12 SCH during the junior/senior year to meet ECE Area Requirement (Area Req) on the EE Course Advising Sheet.
  - 10) 9 SCH during the junior/senior year to meet the ECE Breadth requirement on the EE Course Advising Sheet.
  - 11) 3 SCH during the junior/senior year to meet the Controlled Elective requirement on the EE Course Advising Sheet.

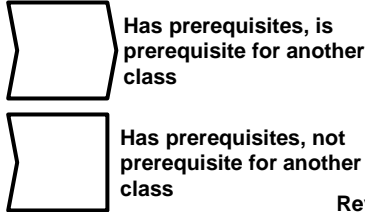
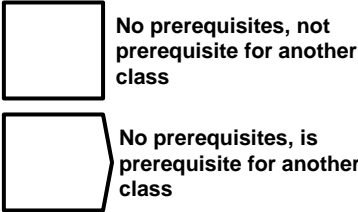


• This flowchart represents one path of many to graduation. Students are not required to follow the chart, but prerequisites limit path options.

• This flowchart is only an advising instrument. When conflicts occur, the official 2021-2022 Degree Requirement Sheet takes precedence. Always check for the most current version of this flowchart.

• Be sure to pay careful attention to the prerequisite requirements, grade requirements, and other official information on Banner. Some prerequisites also have minimum grade requirements. Grade requirements are not shown on this flowchart.

• Consult your Advisor if you have any questions or need clarification.



## Computer Engineering (125 CH): Course Advising Sheet<sup>1</sup>

### I. Required Courses (107 CH):

- ENGL 1113, POLS 1113, HIST 1103, ENGL 3323
- ENGR 1111, ENSC 2611, IEM 3503
- CS 1113, CS 2433, CS 2351, CS 3353, CS 3653, CS 4323 or ECEN 4283.
- MATH 2144, MATH 2153, MATH 2233, MATH 2163, MATH 3013
- CHEM 1414, PHYS 2014, PHYS 2114
- ECEN 2714, ECEN 3213, ECEN 3233, ECEN 3314, ECEN 3513, ECEN 3613, ECEN 3714, ECEN 3903, ECEN 4013, ECEN 4024, ECEN 4213, ECEN 4243, ECEN 4303, ECEN 4503

II. CpE Breadth Requirement (6 CH): Choose any two ECEN 4000 level courses. Exclusions or with ECE approval: ECEN 4010, ECEN 4030. (Other courses, 3000 level or above, in engineering, engineering science, math, physics, chemistry, computer science, or statistics may be allowed with ECE approval.)

III. Controlled Elective (3 CH): Choose a) ENSC 2113, ENSC 2123, ENSC 2143, ENSC 2213, ENSC 3233, or ENSC 3313, or b) any course, 3000 level or above from ECEN, BAE, MAE, CIVE, IEM, PHYS, MATH, CHEM, STAT, or CS. Exclusions or with ECE approval (and in some cases, approval from other departments):

- All ENGR Courses
- ECEN 3020, ECEN 4030
- BAE 4001, BAE 4012, BAE 4400
- CHEM 4990
- CIVE 4010, CIVE 4041, CIVE 4043
- CS 3570, CS 4570, CS 4993
- IEM 4010, IEM 4020, IEM 4913, IEM 4931
- MAE 4010, MAE 4342, MAE 4344, MAE 4353, MAE 4354, MAE 4363, MAE 4374
- MATH 3403, MATH 3603, MATH 3910, MATH 3933, MATH 4033, MATH 4590, MATH 4900, MATH 4910
- PHYS 4010, PHYS 4712, PHYS 4993
- STAT 4053, STAT 4063, STAT 4910, STAT 4981, STAT 4991, STAT 4993

IV. Humanities, Social Science, International, & Diversity Electives (9 CH): A total of at least 6 credits designated as “H” and 3 credits designated as “S” is required. Of these, 3 CH must meet the International Dimensions “I” component and 3 CH must meet the Diversity “D” component.

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<sup>1</sup> Revision Date: July 14, 2021

**Computer Engineering**  
**2021-2022**

**Computer Engineering Course Plan (CpE)**

**Years 1 and 2**

**Semester 1**  
**15 Credit Hours**

CS 1113  
Comp. Science I  
2/2

ENGR 1111  
Intro to Engr  
1/0

MATH 2144  
Calculus I  
4/0

CHEM 1414  
Gen Chemistry  
3/2, Note 1

ENGL 1113  
Freshman Comp I  
3/0, Note 2

CS2433  
CS2351

MATH2153  
PHYS2014  
CS3653

ENGL3323

**Semester 2**  
**17 Credit Hours**

CS 2433  
C/C++ Prog  
3/0

PHYS 2014  
General Physics I  
3/2, Note 5

ECEN 3233  
Digital Logic Des  
2/2

MATH 2153  
Calculus II  
3/0

POLS 1113  
American Gov't  
3/0

CS 2351  
UNIX Prog  
1/0

CS1113

MATH2144

PHYS2114

ECEN4213  
ECEN4243  
ECEN4013  
ECEN4303

MATH2233  
MATH3013  
ECEN2714  
MATH2163  
IEM3503

CS1113

**Semester 3**  
**15 Credit Hours**

MATH 2233  
Diff Equations  
3/0

PHYS 2114  
General Physics II  
3/2, Note 5

ECEN 2714  
Fund Elec Circuits  
3/2, Note 4,9

CS 3653  
Discrete Math  
3/0

ENSC 2611  
Elec Fab Lab  
0/2

ECEN3714

ECEN3714  
ECEN3903

ECEN3714

CS3353

ECEN3314

**Semester 4**  
**16 Credit Hours**

MATH 2163  
Calculus III  
3/0

ECEN 3903  
Intro Semicon Dev  
3/0

ECEN 3714  
Network Analysis  
3/2

ECEN 3213  
Comp Based Systems  
2/2

HIST 1103  
American History  
3/0

ECEN3613

ECEN3314

ECEN3314  
ECEN3513  
ECEN3613  
ECEN4013

ECEN4013  
ECEN4243  
ECEN4213  
CS4323

Course Number  
Course Name

Lecture/Lab  
See Note #

Subsequent Requirement\*\*

\*Only the last prerequisite in a sequence is listed. All earlier prerequisites must also be satisfied before taking the course.

\*\*See your Advisor, the ECE Advising Document, and Banner for additional information.

OSU Requirement

CEAT Requirement

ECE Requirement

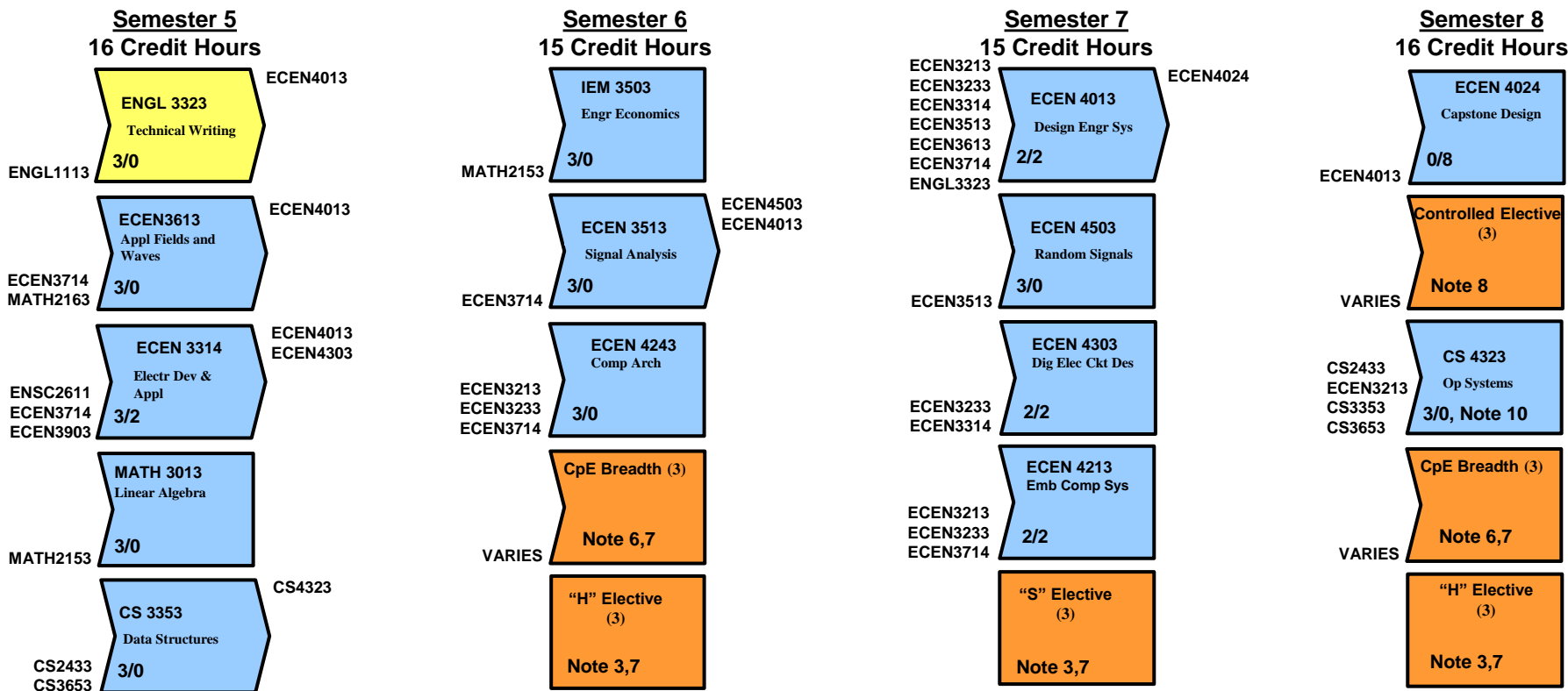
Elective

**Suggested Course Plan**

The anticipation at OSU and most institutions of higher education is that for *one* semester credit hour (SCH) the student spends one hour per week in lecture (two for lab courses) and two hours studying outside of class (one for lab courses). A three credit hour class requires about nine hours per week. This study plan is recommended for students who will devote full time to university studies and do not have excessive extracurricular activities or other obligations.

**NOTES:**

- 1) CHEM 1515 may be substituted for CHEM 1414 and should be taken by all students considering medical school.
- 2) Students with less than a "B" in ENGL 1113 or 1313 must take ENGL 1213 or 1413 prior to ENGL 3323.
- 3) A total of at least 6 hours designated "H" and 3 hours designated "S" are required. Of these, 3 hrs must meet the International Dimension "I" component and 3 hrs must meet the Diversity "D" component.
- 4) ECEN 2714 replaces ENSC 2613 effective fall 2018.
- 5) General Physics I and II are key prerequisites and should be taken at the earliest possible time.
- 6) 6 SCH during the junior/senior year to meet the CpE Breadth requirement on the CpE Course Advising Sheet.
- 7) Must be at least 3 SCH.
- 8) 3 SCH during the junior/senior year to meet the Controlled Elective requirement on the CpE Course Advising Sheet.
- 9) MATH 2233 and PHYS 2114 must be taken prior to or at the same time as ECEN 2714.
- 10) Either CS 4323 or ECEN 4283 (if not previously used) is acceptable. Refer to the CpE Course Advising Sheet.

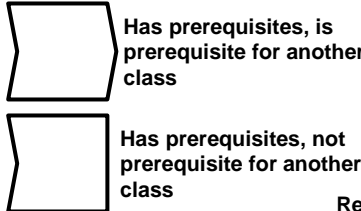
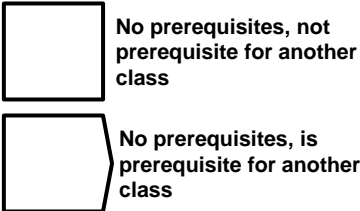


• This flowchart represents one path of many to graduation. Students are not required to follow the chart, but prerequisites limit path options.

• This flowchart is only an advising instrument. When conflicts occur, the official 2021-2022 Degree Requirement Sheet takes precedence. Always check for the most current version of this flowchart.

• Be sure to pay careful attention to the prerequisite requirements, grade requirements, and other official information on Banner. Some prerequisites also have minimum grade requirements. Grade requirements are not shown on this flowchart.

• Consult your Advisor if you have any questions or need clarification.



**Computer Engineering plus Software Engineering Option (128 CH)**  
**Course Advising Sheet<sup>1</sup>**

**I. Required Courses (107 CH):**

- ENGL 1113, POLS 1113, HIST 1103, ENGL 3323
- ENGR 1111, ENSC 2611, IEM 3503
- CS 1113, CS 2433, CS 2351, CS 3353, CS 3653, CS 4323
- MATH 2144, MATH 2153, MATH 2233, MATH 2163, MATH 3013
- CHEM 1414, PHYS 2014, PHYS 2114
- ECEN 2714, ECEN 3213, ECEN 3233, ECEN 3314, ECEN 3513, ECEN 3613, ECEN 3714, ECEN 3903, ECEN 4013, ECEN 4024, ECEN 4213, ECEN 4243, ECEN 4303, ECEN 4503

**II. CpE/SOFT Requirement (12 CH):**

- ECEN 4273 (Software Engineering)
- ECEN 4283 (Computer Networks)
- CS 3363 (Organization of Programming Languages)
- Choose one of the following:
  - CS 4243 (Introduction to Computer Security)
  - CS 4623 (Introduction to Cyber Physical Systems)
  - CS 4153 (Mobile Applications Development)

**IV. Humanities, Social Science, International, & Diversity Electives (9 CH):** A total of at least 6 credits designated as “H” and 3 credits designated as “S” is required. Of these, 3 CH must meet the International Dimensions “I” component and 3 CH must meet the Diversity “D” component.

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<sup>1</sup> Revision Date: July 14, 2021

Computer Engineering

Computer Engineering – Software Engineering (SOFT)

Years 1 and 2

2021-2022

Course Plan (CpE)

Semester 1

15 Credit Hours

CS 1113  
Comp. Science I

2/2

CS2433  
CS2351

ENGR 1111  
Intro to Engr

1/0

MATH 2144  
Calculus I

4/0

MATH2153  
PHYS2014  
CS3653

CHEM 1414  
Gen Chemistry

3/2, Note 1

ENGL 1113  
Freshman Comp I

3/0, Note 2

ENGL3323

Semester 2

17 Credit Hours

CS 2433  
C/C++ Prog

3/0

CS1113

ECEN3213  
CS3353

PHYS 2014  
General Physics I

3/2, Note 5

MATH2144

PHYS2114

ECEN 3233  
Digital Logic Des

2/2

ECEN4213  
ECEN4243  
ECEN4013  
ECEN4303

MATH 2153  
Calculus II

3/0

MATH2144

MATH2233  
MATH3013  
ECEN2714  
MATH2163  
IEM3503

POLS 1113  
American Gov't

3/0

CS 2351  
UNIX Prog

1/0

CS1113

Semester 3

15 Credit Hours

MATH 2233  
Diff Equations

3/0

MATH2153

ECEN3714

PHYS 2114  
General Physics II

3/2, Note 5

PHYS2014

ECEN3714  
ECEN3903

ECEN 2714  
Fund Elec Circuits

3/2, Note 4,9

MATH2153

ECEN3714

CS 3653  
Discrete Math

3/0

MATH2144

CS3353

ENSC 2611  
Elec Fab Lab

0/2

ECEN3314

Semester 4

16 Credit Hours

MATH 2163  
Calculus III

3/0

MATH2153

ECEN3613

ECEN 3903  
Intro Semicon Dev

3/0

PHYS2114

ECEN3314

ECEN 3714  
Network Analysis

3/2

ECEN2714  
MATH2233  
PHYS2114

ECEN3314  
ECEN3513  
ECEN3613  
ECEN4013

ECEN 3213  
Comp Based Systems

2/2

CS2433

ECEN4013  
ECEN4243  
ECEN4213  
CS4323

HIST 1103  
American History

3/0

Course Number  
Course Name

Subsequent Requirement\*\*

Lecture/Lab  
See Note #

\*Only the last prerequisite in a sequence is listed. All earlier prerequisites must also be satisfied before taking the course.

Prerequisites\*

\*\*See your Advisor, the ECE Advising Document, and Banner for additional information.

OSU Requirement

CEAT Requirement

ECE Requirement

Elective

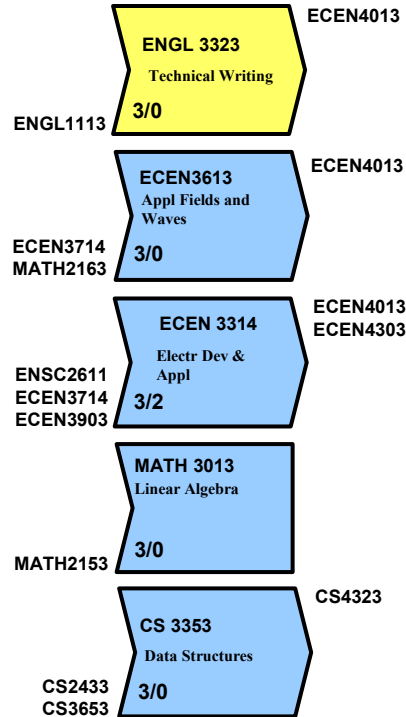
**Suggested Course Plan (128 hours)**  
The anticipation at OSU and most institutions of higher education is that for *one* semester credit hour (SCH) the student spends one hour per week in lecture (two for lab courses) and two hours studying outside of class (one for lab courses). A three credit hour class requires about nine hours per week. This study plan is recommended for students who will devote full time to university studies and do not have excessive extracurricular activities or other obligations.

- NOTES:**
- 1) CHEM 1515 may be substituted for CHEM 1414 and should be taken by all students considering medical school.
  - 2) Students with less than a "B" in ENGL 1113 or 1313 must take ENGL 1213 or 1413 prior to ENGL 3323.
  - 3) A total of at least 6 hours designated "H" and 3 hours designated "S" are required. Of these, 3 hrs must meet the International Dimension "I" component and 3 hrs must meet the Diversity "D" component.
  - 4) ECEN 2714 replaces ENSC 2613 effective fall 2018.
  - 5) General Physics I and II are key prerequisites and should be taken at the earliest possible time.
  - 6) MATH 2233 and PHYS 2114 must be taken prior to or at the same time as ECEN 2714.
  - 7) Either CS 4323 or ECEN 4283 (if not previously used) is acceptable. Refer to the CpE Course Advising Sheet.

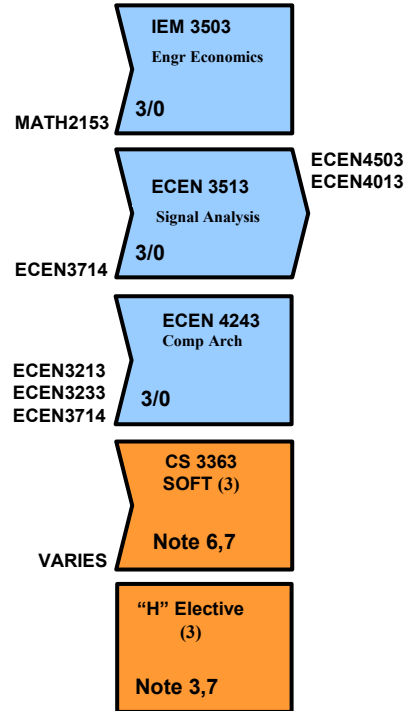
# Computer Engineering – Software Engineering (SOFT) *Years 3 and 4*

## 2021-2022 Course Plan (CpE)

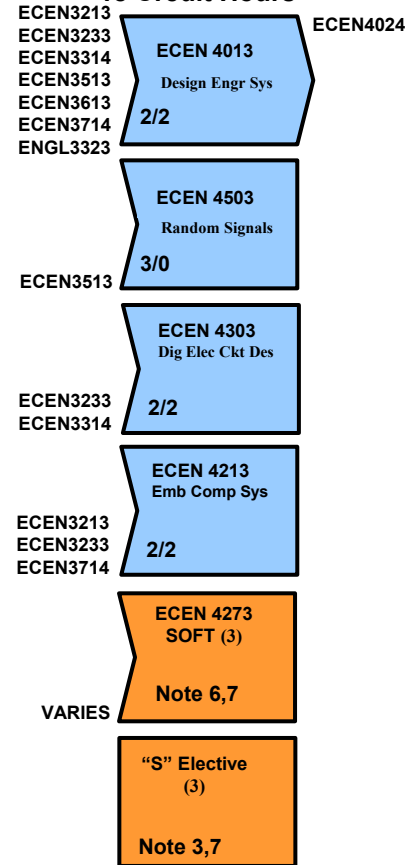
### Semester 5 16 Credit Hours



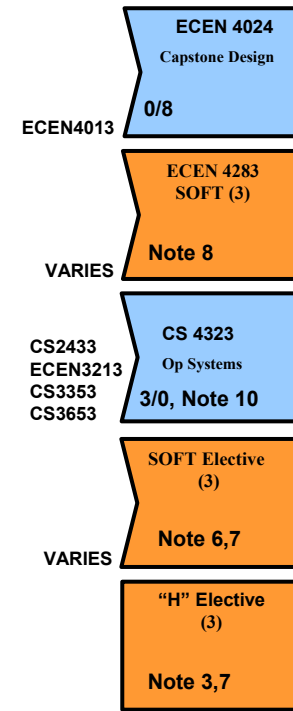
### Semester 6 15 Credit Hours



### Semester 7 18 Credit Hours



### Semester 8 16 Credit Hours

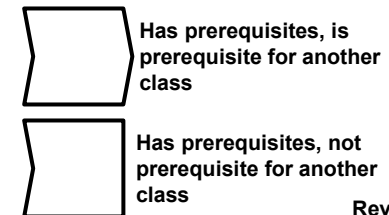
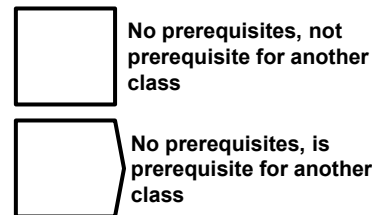


• This flowchart represents one path of many to graduation. Students are not required to follow the chart, but prerequisites limit path options.

• This flowchart is only an advising instrument. When conflicts occur, the official 2021-2022 Degree Requirement Sheet takes precedence. Always check for the most current version of this flowchart.

• Be sure to pay careful attention to the prerequisite requirements, grade requirements, and other official information on Banner. Some prerequisites also have minimum grade requirements. Grade requirements are not shown on this flowchart.

• Consult your Advisor if you have any questions or need clarification.





## Computer Engineering and Electrical Engineering Dual Degree (137 CH)

### Course Advising Sheet<sup>1</sup>

#### I. Required Courses (110 CH):

- ENGL 1113, POLS 1113, HIST 1103, ENGL 3323
- ENGR 1111, ENSC 2113, ENSC 2611, IEM 3503
- CS 1113, CS 2433, CS 2351, CS 3353, CS 3653; CS 4323 or ECEN 4283.
- MATH 2144, MATH 2153, MATH 2233, MATH 2163, MATH 3013
- CHEM 1414, PHYS 2014, PHYS 2114
- ECEN 2714, ECEN 3213, ECEN 3233, ECEN 3314, ECEN 3513, ECEN 3613, ECEN 3714, ECEN 3903, ECEN 4013, ECEN 4024, ECEN 4213, ECEN 4243, ECEN 4303, ECEN 4503

II. EE Area Requirement (12 CH): Choose a set of area courses from columns A, B, D, or, E in the table below. (Substitutions, except ECEN 32XX and ECEN 42XX computer engineering courses, may be allowed under extenuating circumstances with ECE approval.)

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
	<b>Com/Controls/ DSP</b>	<b>Power/Energy</b>	<b>Computer/ Digital</b>	<b>Electronics/ Solid State</b>	<b>Microwaves/ Photonics</b>
<b>EE Area Req. 1</b>	ECEN 3723	ECEN 3723 or ECEN 3913	<del>ECEN 3723 or ECEN 3913</del>	ECEN 3913	ECEN 3913
<b>EE Area Req. 2</b>	ECEN 4413	ECEN 3113	<del>ECEN 4213</del>	ECEN 4313	ECEN 3623
<b>EE Area Req. 3</b>	ECEN 4523 or ECEN 4533	ECEN 4133	<del>ECEN 4243</del>	ECEN 4353	ECEN 4613 or ECEN 4823
<b>EE Area Req. 4</b>	ECEN 4763	ECEN 4153	<del>ECEN 4303</del>	ECEN 4613	ECEN 4353 or ECEN 4843

III. EE/CpE Breadth Requirement (6 CH): Choose two ECEN 4000 level courses. Exclusions or with ECE approval: ECEN 4010, ECEN 4030. (Other courses, 3000 level or above, in engineering, engineering science, math, physics, chemistry, computer science, or statistics may be allowed with ECE approval.)

IV. Controlled Elective: Automatically satisfied under the EE requirement when ENSC 2113 is completed; see Section I.

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<sup>1</sup> Revision Date: July 14, 2021

V. Humanities, Social Science, International, & Diversity Electives (9 CH): A total of at least 6 credits designated as “H” and 3 credits designated as “S” is required. Of these, 3 CH must meet the International Dimensions “I” component and 3 CH must meet the Diversity “D” component.

## **ECEN Courses for the BSEE and BSCpE Degrees**

- ECEN 2714 - Fundamentals of Electric Circuits
- ECEN 3113 - Energy, Environment and Economics
- ECEN 3213 – Computer Based Systems in Engineering
- ECEN 3233 - Digital Logic Design
- ECEN 3314 - Electronic Devices and Applications
- ECEN 3513 - Signal Analysis
- ECEN 3613 – Applied Fields and Waves I
- ECEN 3623 – Applied Fields and Waves II
- ECEN 3714 - Network Analysis
- ECEN 3723 - Systems I
- ECEN 3903 - Introduction to Semiconductor Devices
- ECEN 3913 - Solid State Electronic Devices
- ECEN 4013 - Design of Engineering Systems
- ECEN 4024 - Capstone Design
- ECEN 4133 - Power Electronics
- ECEN 4153 - Power System Analysis and Design
- ECEN 4213 - Embedded Computer Systems Design
- ECEN 4233 - High Speed Computer Arithmetic
- ECEN 4243 - Computer Architecture
- ECEN 4273 - Software Engineering
- ECEN 4283 - Computer Networks
- ECEN 4303 - Digital Integrated Circuit Design
- ECEN 4313 - Linear Electronics Circuit Design
- ECEN 4353 - Communication Electronics
- ECEN 4413 - Automatic Control Systems
- ECEN 4503 - Random Signals and Noise
- ECEN 4523 - Communication Theory
- ECEN 4533 - Data Communications
- ECEN 4613 - Microwave Engineering
- ECEN 4703 - Active Filter Design
- ECEN 4743 - Introduction to Biomedical Engineering Modeling and Systems
- ECEN 4763 - Introduction to Digital Signal Processing
- ECEN 4773 - Real Time Digital Signal Processing
- ECEN 4823 - Design of Optical Systems
- ECEN 4843 - Design of Lasers and Systems

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### **Power and Energy**

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- Prof. James Stine, 215B GAB ([james.stine@okstate.edu](mailto:james.stine@okstate.edu))

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