Weber State University

Electrical and Computer Engineering

Department Handbook

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Chapter 1

Introduction

Welcome to the Department of Electrical and Computer Engineering at Weber State University! As a student in our Electrical, Computer, or Biomedical Engineering program, you embark on an exciting journey of discovery, innovation, and personal growth. This handbook is designed to provide essential information about the program's curriculum, academic policies, resources, and opportunities available during your undergraduate studies. We encourage you to familiarize yourself with the contents of this handbook and refer to it whenever you have questions about your academic journey.

The Department of Electrical and Computer Engineering at Weber State University is committed to providing high-quality education and fostering a supportive learning environment for aspiring electrical, computer, and biomedical engineers. Our faculty members are experts in various engineering fields and are dedicated to helping you succeed academically and professionally. Our state-of-the-art laboratories, cutting-edge research initiatives, and collaborative learning opportunities ensure that you receive a well-rounded education and are prepared to tackle the challenges of the modern world.

This handbook provides detailed information about the ECE department's curriculum, academic policies, available resources, and various opportunities to enhance your learning experience. We encourage you to take full advantage of the department's resources and support services to make the most of your time here.

We wish you a fulfilling and successful academic journey in the Department of Electrical and Computer Engineering at Weber State.

Chapter 2

Department Organization

2.1 Department structure

The Electrical and Computer Engineering Department is structured to provide students with a robust academic foundation and real-world applications. The department is led by a dedicated team of experienced faculty members and administrators passionate about advancing the electrical and computer engineering field.

Position	**Name**
Chair	Fon Brown, PhD
Undergraduate Program Coordinator	Eric Gibbons, PhD
Graduate Program Director	Tye Gardner, PhD

The ECE faculty members are experts in various fields, including electronics, communications, computer systems, robotics, and power systems. Students are encouraged to interact with faculty members, attend office hours, and seek mentorship for academic and research pursuits.

2.1.1 ECE Advising and Support

In addition to faculty members, the department has dedicated staff members who assist with administrative, advising, and technical support services. The staff directory provides contact information for administrative assistants, advisors, laboratory technicians, and other support personnel.

Position	**Name**
Administrative assistant	Judy Smith
Academic advisor	Aimee Golden
Graduate enrollment director	Rainie Ingram

2.1.2 Office hours and contact information

Faculty and staff members have designated office hours during which students can ask questions, seek clarification, and discuss academic matters. Office hours are posted on the department's website and outside individual faculty offices. Contact information for faculty and staff members is also available online.

2.1.3 Faculty office access policy

The ECE Department has implemented specific guidelines regarding access to faculty offices to ensure students' and faculty members' safety and security. These guidelines are essential for maintaining a professional and respectful environment.

Policy Details:

1. **Office Hours:** Faculty members will specify regular office hours during which students are welcome to visit without a prior appointment. Students can seek assistance, guidance, or academic support during these designated hours.
2. **Scheduled Appointments:** Students must arrange appointments in advance to meet faculty outside office hours. Faculty members are encouraged to communicate their availability and to schedule appointments with students where appropriate.
3. **Limited Access:** Students should not go beyond the reception area unless they have an appointment or to visit a faculty member during designated office hours.
4. **Respect for Privacy:** If a faculty member's office door is closed, students must respect his or her privacy (and potentially that of another student) and not attempt to open the door. A student may knock once lightly to let the faculty member know he or she is waiting.
5. **Front Desk Assistance:** Students requiring assistance should approach the front desk, where department staff will be available to address general inquiries, provide guidance on scheduling appointments, or check the availability of faculty members.

2.1.4 Industrial Advisory Board

The Industrial Advisory Board for the Electrical Engineering and Computer Engineering Programs shall consist of faculty and local engineering employers. The IEEE student chapter president (or whomever he or she shall delegate) shall serve as a non-voting ex-officio member to provide student perspective and advance student initiatives where appropriate.

2.2 Department facilities

Our department boasts state-of-the-art laboratories equipped with the latest technology.

2.2.1 Linux Lab

The Linux Lab in room NB 203 has 27 Linux workstations running Ubuntu LTS. Students must request an account by contacting Dr. West or Dr. Gibbons to access the lab computers.

Lab access

Students granted accounts may access the Linux lab during the lab's operating hours, which will be posted outside the lab and on the department's website. General access is prohibited when a scheduled class or lab uses the room.

Responsible use

Users are expected to utilize lab resources responsibly and respect the rights of others. Users may not install, modify, or remove software or hardware without permission. Users will be financially liable for damages.

Saving and backing up data

Users should save their work in designated folders. However, it is the users' responsibility to back up their data regularly. The lab computers will be regularly wiped, and any unsaved data will be lost.

Food and beverages

No food or beverages (non-water) are allowed near the computer workstations to prevent accidental spills and damage. Water bottles with a lid are allowed.

Lab etiquette

Users must maintain a quiet, focused environment in the Linux lab to facilitate learning and productivity. Headphones should be used for audio to avoid disturbing others.

Security

Users should log out of the computer after use but leave the computer on to allow remote access. Personal belongings should not be left unattended in the lab.

Consequences of violation

Violations of this policy may result in temporary or permanent suspension of lab access privileges or such disciplinary actions deemed appropriate by the Dean of Students.

2.2.2 Open Access Electronics Lab

The Open Access Electronics Lab in NB 102 provides students and faculty with a collaborative and innovative environment for learning, experimenting, and creating electronic and computer engineering projects. This policy outlines the guidelines and expectations for the use of this facility.

Access and hours

The lab is accessible to registered Electrical and Computer Engineering Department students and faculty. Access will be granted during specified hours, posted on the department's website, and displayed at the lab entrance. Any exceptions or changes in operating hours will be communicated in advance.

Students who allow non-authorized users access to the lab will lose access.

Responsibilities

Users must follow all safety guidelines, respect the lab equipment, and use resources responsibly. Any intentional damage or misuse of lab equipment will result in disciplinary action. Lab staff will provide technical support, ensure equipment functionality, and promote a conducive learning environment. They have the authority to enforce lab rules and regulations.

Equipment usage

Users must share equipment and resources. Excessive usage that prevents others from accessing equipment is not permitted. Users must adhere to all safety instructions provided for specific equipment. Safety gear, such as goggles and gloves, must be worn when appropriate.

Parts

Electronic components (resistors, capacitors, semiconductors, etc.) are free of charge to students within reasonable limits. Students should not take more components than are necessary and should

not return questionable parts to the drawers or bins. (Never return a semiconductor to the parts bin once power has been applied.)

Cleanliness and maintenance

Students must leave the workstation clean and tidy, and waste materials must be disposed of properly. The benchtop equipment must be turned off, and all accessories (leads, probes, connectors) must be returned to the rack or drawer from which they came. Users should immediately report any malfunctioning equipment or safety hazards to lab staff.

Food and drink are not permitted in the lab.

Printing

Printing in NB 102 is allowed within reasonable limits. Excessive printing or any unauthorized use of printers is not permitted. Users are responsible for promptly collecting their printouts.

Compliance

Users must comply with all university policies and codes of conduct. Violations may result in the loss of lab privileges and further disciplinary action.

2.2.3 Teaching Electronics Labs

The electronics labs in NB 103, NB 104, and NB 112 are teaching labs. In the labs, each station is equipped with the following instruments: an oscilloscope, function generator, power supply, multimeter, and Windows PC with course-specific software.

Lab access and priority

Lab access is restricted to students enrolled in the scheduled class during their designated time. Faculty may make exceptions to this rule, but priority is always given to the class using the lab during their scheduled time. Access outside scheduled class hours is prohibited without faculty permission.

Equipment usage guidelines

Students are expected to use lab equipment responsibly and follow all safety guidelines. Proper shutdown procedures must be followed for all instruments and computer log-off after use.

Oscilloscope probe usage

Oscilloscope probes are to be treated with care. Students must ask the lab staff to check out oscilloscope probes. Abusing, damaging, or removing parts from oscilloscope probes may result in losing lab privileges.

Lab etiquette

Maintain a quiet and focused environment in the lab to facilitate learning and concentration. Headphones should be used for audio to avoid disturbing others. Food and beverages are prohibited near the lab equipment to prevent spills and damage. Personal belongings should not be placed on chair seats or left unattended in the lab.

Consequences of violation

Violations of this policy may result in disciplinary actions, including but not limited to loss of lab privileges, academic penalties, and further consequences as determined by the instructor or department.

2.2.4 Specialty lab

Lab policies for specialty labs, such as the Optics Lab, Microscopy and Microfabrication Lab, and Electromagnetics Lab are outlined below.

Lab access

Access will be determined and approved by ECE faculty.

Food and beverages

No food or beverages are allowed in the microscopy suite at any time.

Security

The lab contains many delicate items of high value. Many instruments are temperature- and environment-controlled, so the doors must always remain shut. The lab must remain locked at all times, and no access must be granted to anyone without the express consent of ECE faculty.

Consequences of violation

Violations of this policy may result in temporary or permanent suspension of lab access privileges or disciplinary actions deemed appropriate by the Dean of Students.

2.2.5 Robotics and Power Lab

The Robotics and Power Lab in room NB136 contains all of the equipment for the power systems and robotics courses.

Lab access

Power Due to the potentially dangerous nature of the power equipment, students in power courses will only be granted access to the lab during scheduled, supervised lab times. Students are never allowed to operate any power station equipment unless an instructor is present.

Robotics Students in the robotics classes will be granted card access to the lab outside the scheduled lab sessions; however, general access is prohibited when any other scheduled lab uses the room.

Responsible use

Power Every power station must be returned to a clean state with all wires removed and properly stored on the racks. All meters and test equipment must be stored in the cabinet and drawer beside the table. The motors and breaks may be left on the platform for future use. Any additional equipment must be returned to the shelves.

Robotics The robotics students may use any work table but must leave the power equipment as-is. All robotics hardware must be properly stored in the cabinets or shelves.

Food and beverages

No food or beverages are allowed in the power lab at any time.

Security

The lab contains many items of high value. The lab must remain locked, and no access must be granted to students not enrolled in the courses. All power stations and robotics hardware will be inventoried, and students will be liable for missing items.

Consequences of Violation

Violations of this policy may result in temporary or permanent suspension of lab access privileges or disciplinary actions deemed appropriate by the Dean of Students.

2.3 Student resources

2.3.1 Academic advising

Our dedicated academic advisors assist students in course selection, career planning, and graduate school applications. Regular advising sessions ensure students stay on track to meet their educational and career goals.

2.3.2 Career services

The ECE Department collaborates with the college's Career Services Center to provide internship and job placement opportunities, career fairs, and networking events with industry professionals. Workshops on resume-building and interview skills are also offered.

2.3.3 Student clubs and organizations

Students can engage with like-minded peers and enhance their leadership skills by joining student organizations such as the IEEE Student Branch and (if invited) Tau Beta Pi. These organizations offer a platform to collaborate on projects, attend conferences, and participate in competitions, enriching your university experience.

Chapter 3

Program overview

3.1 Mission and goals

The mission of the Electrical and Computer Engineering (ECE) department at Weber State is to educate students to become skilled and innovative engineers who contribute effectively to society. Our programs aim to provide a comprehensive understanding of electrical, computer, and biomedical engineering principles, foster critical thinking and problem-solving skills, and prepare graduates for successful careers in various industries or advanced studies in graduate school.

3.1.1 Program learning outcomes

Upon completion of the ECE programs, students are expected to demonstrate the following learning outcomes:

- Apply mathematical, scientific, and engineering principles to solve complex electrical, computer, or biomedical engineering problems.
- Design and conduct experiments and analyze and interpret data in electrical, computer, or biomedical engineering domains.
- Design systems and components and integrate them into complex, realistic contexts.
- Work effectively in multidisciplinary teams, demonstrating communication, leadership, and project management skills.
- Recognize engineering solutions' ethical and social implications and make informed decisions in professional practice.
- Engage in lifelong learning through continuous professional development and advanced studies.

3.2 Degree programs

The Department of Electrical and Computer Engineering offers the following undergraduate degrees:

- Bachelor of Science in Electrical Engineering (BSEE)
- Bachelor of Science in Computer Engineering (BSCE)
- Bachelor of Science in Biomedical Engineering (BSBME)

3.2.1 Electrical Engineering

The following is a suggested plan to complete the BSEE degree in four years. Meet with an academic advisor to create a plan that fits your educational needs best. Taking an average of 15 credit hours per semester facilitates timely graduation.

Course	Cr.	Prerequisites	Offered
Freshman (Semester 1)			
MATH 1210 — Calculus I	4	F, Sp, Su	
PHYS 2210 — Phys. for SE I	5	F, Sp	Co: MATH 1210
ECE 1000 — Intro. to EE	2	F, Sp	
Gen. Ed. — AI	3	F, Sp, Su	
LIBS 1704 — Info. Nav.	1	F, Sp, Su	
Total Semester Credits:	15		
Freshman (Semester 2)			
MATH 1220 — Calculus II	4	F, Sp, Su Pre: MATH 1210	
PHYS 2220 — Phys. for SE II	5	F, Sp Pre: PHYS 2210	Co: MATH 1220
ECE 1400 — Fund. of Eng. Comp.	4	F, Sp Pre: MATH 1210	Co: ECE 1000
ECE 2700 — Digital Circuits	4	F, Sp	Co: ECE 1000
Total Semester Credits:	17		
Sophomore (Semester 3)			
MATH 2210 — Calculus III	4	F, Sp, Su Pre: MATH 1220	
CHEM 1230 — Eng. Chemistry	5	Sp	
ECE 1270 — Intro. to Elec. Circuits	4	F, Sp Pre: MATH 1210	Co: MATH 1220, ECE 1000
ENGL 2010 — Int. Writing	3	F, Sp, Su	
Total Semester Credits:	16		
Sophomore (Semester 4)			
ENGR 2240 — Dyn. Sys. Eng.	4	Sp Pre: MATH 1220, ECE 1270, ECE 1400	
ECE 2260 — Fund. of Elec. Circ.	4	Sp Pre: MATH 1220, ECE 1270	Co: ENGR 2240, ECE 1400
ECON 2010 — Prin. of Microecon.	3	F, Sp, Su	
COMM 2110 — Group Comm.	3	F, Sp, Su	
Gen. Ed. — CA/CC	3	F, Sp, Su	
Total Semester Credits:	17		
Junior (Semester 5)			
ECE 3000 — Eng. Seminar	1	F Pre: ECE 1270	
ECE 3110 — Microelec. I	4	F Pre: MATH 1220, ECE 1270	
ECE 3210 — Sig. and Systems	4	F Pre: ENGR 2240, ECE 2260	
ECE 3610* — Digital Sys.	4	F Pre: ECE 1400, ECE 2700	
ECE 3890 — Internship	1	F, Sp, Su	
Total Semester Credits:	14		

Junior (Semester 6)			
ECE 3120 — Microelec. II	4	Sp Pre: ECE 2260, ECE 3110	
ECE 3310 — Electromag. I	4	Sp Pre: MATH 2210, PHYS 2220, ECE 1270	
ECE 3430 — Eng. Prob. and Stats.	3	Sp Pre: MATH 1220, ECE 1400	
ECE 3710 — Embedded Sys.	4	Sp Pre: ECE 1400, ECE 2700	
ECE 3090 — Project Mgmt.	2	F, Sp	Co: ECE 3110, ECE 3210, ECE 3310, ECE 3610*, ECE 3710
Total Semester Credits:	17		
Senior (Semester 7)			
ECE 4010 — Sr. Proj. I	2	F, Sp	
ECE 4100* — Control Sys.	4	F Pre: ECE 3110, ECE 3210	
ECE 5XXX — Sr. Elec. I	3	F, Sp	
ECE 5XXX — Sr. Elec. II	3	F, Sp	
Gen. Ed. — LS/CC	3	F, Sp, Su	
Total Semester Credits:	15		
Senior (Semester 8)			
ECE 4020 — Sr. Proj. II	2	F, Sp	
ECE 5XXX — Sr. Elec. III	3	F, Sp	
ECE 5XXX — Sr. Elec. IV	3	F, Sp	
Gen. Ed. — SS/CC	3	F, Sp, Su	
Gen. Ed. — CA or HU/CC	3	F, Sp, Su	
Total Semester Credits:	14		
Total Bachelor Credits:	125		

* The following alternatives are acceptable:

- ECE 3510 Power Systems may be replaced by ECE 3610.
- ECE 5210 Digital Signal Processing may be taken instead of ECE 4100, though ECE 5210 is typically taught during the spring semester.

Acceptable Senior Electives are given below. Senior Electives are usually taught on an every-other-year basis.

Course	Cr.	Prerequisites
CS 5610 — Computer Architecture	3	Pre: ECE 3710
ECE 3510 — Power Systems	4	Pre: ECE 1270, ECE 2210
ECE 3610 — Digital Systems	3	Pre: ECE 2700, ECE 1400
ECE 3620 — Microprocessor Architecture	2	Pre: ECE 3610 Co: ECE 3710
ECE 3730 — Fundamentals of Robotics	4	Pre: ECE 1400
ECE 4100 — Control Systems	4	Pre: ECE 3110, ECE 3210
ECE 5110 — Digital VLSI Design	3	Pre: ECE 3110, ECE 3610
ECE 5120 — Analog VLSI Design	3	Pre: ECE 3120
ECE 5130 — Advanced Semiconductor Devices	3	Pre: PHYS 2220, ECE 3110
ECE 5140 — Sensors and Instrumentation	3	Pre: PHYS 2220, ECE 3110
ECE 5150 — Thin Film Engineering	3	Pre: PHYS 2220, ECE 3430
ECE 5210 — Digital Signal Processing	4	Pre: ECE 3210

ECE 5220 — Image Processing	3	Pre: ECE 3210
ECE 5230 — Engineering Applications in Deep Learning	3	Pre: ECE 3210, ECE 3430
ECE 5310 — Electromagnetics II	3	Pre: ECE 3310
ECE 5320 — Antennas Wave Propagation	3	Pre: ECE 3310
ECE 5410 — Communication Circuits and Systems	3	Pre: ECE 3210, ECE 3430
ECE 5420 — Digital Communication	3	Pre: ECE 3210, ECE 3430
ECE 5440 — Optical Communication Systems	3	Pre: ECE 3310
ECE 5510 — Advanced Power Systems	3	Pre: ECE 3510
ECE 5620 — Digital System Testing	3	Pre: ECE 3610
ECE 5640 — Model-based Systems Engineering	3	Pre: ECE 3610
ECE 5710 — Real-Time Systems	4	Pre: ECE 3710
ECE 5730 — Robotics	4	Pre: ECE 3730, ECE 4100
ECE 5750 — Quantum Computing Engineering	3	Pre: ECE 2700, ECE 2220, ECE 3430, ENGR 2240
MATH 4160 — Intro. to Mathematical Cryptography	3	Pre: CS 1400, MATH 3410

Note: at most, one 3000-level course can be an acceptable Senior Level elective.

3.2.2 Computer Engineering

The following is a suggested plan to complete the BSCE degree in four years. Meet with an academic advisor to create a plan that fits your educational needs best. Taking an average of 15 credit hours per semester facilitates timely graduation.

Course	Cr.	Prerequisites	Offered
Freshman (Semester 1)			
MATH 1210 — Calculus I	4	F, Sp, Su	
PHYS 2210 — Phys. for SE I	5	F, Sp	Co: MATH 1210
ECE 1000 — Intro. to EE	2	F, Sp	
Gen. Ed. — AI	3	F, Sp, Su	
Gen. Ed. — CA/CC	3	F, Sp, Su	
Total Semester Credits:	17		
Freshman (Semester 2)			
MATH 1220 — Calculus II	4	F, Sp, Su Pre: MATH 1210	
PHYS 2220 — Phys. for SE II	5	F, Sp Pre: PHYS 2210	Co: MATH 1220
ECE 1400 — Fund. of Eng. Comp.	4	F, Sp Pre: MATH 1210	Co: ECE 1000
ECE 2700 — Digital Circuits	4	F, Sp	Co: ECE 1000
Total Semester Credits:	17		
Sophomore (Semester 3)			
ECE 1270 — Intro. to Elec. Circuits	4	F, Sp Pre: MATH 1210	Co: MATH 1220, ECE 1000
CS 1410 — Obj.-Orient. Prog.	4	F, Sp, Su Pre: ECE 1400	
ENGL 2010 — Int. Writing	3	F, Sp, Su	
ECON 2010 — Prin. of Microecon.	3	F, Sp, Su	
COMM 2110 — Group Comm.	3	F, Sp, Su	
Total Semester Credits:	17		
Sophomore (Semester 4)			

ENGR 2240 — Dyn. Sys. Eng.	4	Sp Pre: MATH 1220, ECE 1270, ECE 1400	
ECE 2260 — Fund. of Elec. Circ.	4	Sp Pre: MATH 1220, ECE 1270	Co: ENGR 2240, ECE 1400
CS 2130 — Comp. Structures	4	F, Sp, Su Pre: ECE 1400	
CS 2420 — Data Struc. Alg.	4	F, Sp, Su Pre: CS 1410	
LIBS 1704 — Info. Nav.	1	F, Sp, Su	
Total Semester Credits:	17		
Junior (Semester 5)			
ECE 3000 — Eng. Seminar	1	F Pre: ECE 1270	
ECE 3110 — Microelec. I	4	F Pre: MATH 1220, ECE 1270	
ECE 3210 — Sig. and Systems	4	F Pre: ENGR 2240, ECE 2260	
ECE 3610 — Digital Sys.	4	F Pre: ECE 1400, ECE 2700	
ECE 3890 — Internship	1	F, Sp, Su	
Total Semester Credits:	14		

Junior (Semester 6)			
ECE 3430 — Eng. Prob. and Stats.	3	Sp Pre: MATH 1220, ECE 1400	
ECE 3620 — Micro. Arch.	3	Sp Pre: ECE 3610	Co: ECE 3710
ECE 3710 — Embedded Sys.	4	Sp Pre: ECE 1400, ECE 2700	
ECE 3090 — Project Mgmt.	2	F, Sp	Co: ECE 3110, ECE 3210, ECE 3610, ECE 3710, CS 3100
CS 3100 — Operating Sys.	4	F, Sp, Su	Co: ECE 3620
Total Semester Credits:	16		
Senior (Semester 7)			
ECE 4010 — Sr. Proj. I	2	F, Sp	
ECE 5XXX — Sr. Elec. I	3	F, Sp	
ECE 5XXX — CS Elec. I	3	F, Sp, Su	
Gen. Ed. — LS/CC	4	F, Sp, Su	
Total Semester Credits:	12		
Senior (Semester 8)			
ECE 4020 — Sr. Proj. II	2	F, Sp	
ECE 5XXX — Sr. Elec. II	3	F, Sp	
ECE 5XXX — Sr. Elec. III	3	F, Sp	
Gen. Ed. — SS/CC	3	F, Sp, Su	
Gen. Ed. — CA or HU/CC	3	F, Sp, Su	
Total Semester Credits:	14		
Total Bachelor Credits:	124		

Acceptable Senior Electives are given below. Senior Electives are usually taught on an every-other-year basis.

Course	Cr.	Prerequisites
CS 4110 — Formal Languages and Algorithms	4	Pre: CS 2130, CS 2420
CS 4280 — Computer Graphics	4	Pre: CS 2420
CS 5100 — Distributed Operating Systems	3	Pre: CS 3100
CS 5200 — Internet of Things	3	Pre: ECE 3710
CS 5420 — Advanced Algorithms	3	Pre: CS 2420
CS 5500 — Advanced Artificial Intelligence	3	Pre: CS 2130, CS 2420
CS 5600 — Machine Learning	3	Pre: CS 2420
CS 5610 — Computer Architecture	3	Pre: ECE 3710
CS 5740 — Computer Systems Security	3	Pre: CS 2420, CS 3100
CS 5820 — Compiler Design	3	Pre: CS 2130, CS 2420
CS 5840 — Formal System Design	3	Pre: CS 2420
CS 5850 — Parallel Prog. and Arch.	3	Pre: CS 3100
ECE 3310 — Electromagnetics I	4	Pre: MATH 2210, PHYS 2220, ECE 1270
ECE 3510 — Power Systems	4	Pre: ECE 1270, ECE 2210
ECE 3730 — Fundamentals of Robotics	4	Pre: ECE 1400
ECE 4100 — Control Systems	4	Pre: ECE 3110, ECE 3210
ECE 5110 — Digital VLSI Design	3	Pre: ECE 3110, ECE 3610
ECE 5130 — Advanced Semiconductor Devices	3	Pre: PHYS 2220, ECE 3110
ECE 5140 — Sensors and Instrumentation	3	Pre: PHYS 2220, ECE 3110

ECE 5210 — Digital Signal Processing	4	Pre: ECE 3210
ECE 5220 — Image Processing	3	Pre: ECE 3210
ECE 5230 — Engineering Applications in Deep Learning	3	Pre: ECE 3210, ECE 3430
ECE 5410 — Communication Circuits and Systems	3	Pre: ECE 3210, ECE 3430
ECE 5420 — Digital Communication	3	Pre: ECE 3210, ECE 3430
ECE 5440 — Optical Communication Systems	3	Pre: ECE 3310
ECE 5640 — Model-based Systems Engineering	3	Pre: ECE 3610
ECE 5710 — Real-Time Systems	4	Pre: ECE 3710
ECE 5750 — Quantum Computing Engineering	4	Pre: ECE 2700, ECE 2220, ECE 3430, ENGR 2240
MATH 4160 — Intro. to Mathematical Cryptography	3	Pre: CS 1400, MATH 3410

Note: at most, one 3000-level course can be an acceptable Senior Level elective.

3.2.3 Biomedical Engineering

The following is a suggested plan to complete the BSBME degree in four years. Meet with an academic advisor to create a plan that fits your educational needs best. Taking an average of 15 credit hours per semester facilitates timely graduation.

Course	Cr.	Prerequisites	Offered
Freshman (Semester 1)			
Math 1210 — Calculus I	4	F, Sp, Su	
PHYS 2210 — Phys. for SE I	5	F, Sp	Co: Math 1210
BME 1000 — Intro. to BME	2	F, Sp	
Gen. Ed. — HU/CA or HU/SS	3	F, Sp, Su	
Gen. Ed. — SS or CA	3	F, Sp, Su	
Total Semester Credits:	17		
Freshman (Semester 2)			
Math 1220 — Calculus II	4	F, Sp, Su Pre: Math 1210	
CHEM 1210 — Chemistry I	4	F, Sp, Su	
CHEM 1210 — Chemistry I Lab	1	F, Sp, Su	
PHYS 2220 — Phys. for SE II	5	F, Sp Pre: PHYS 2210	Co: Math 1220
ECE 1400 — Fund. of Eng. Comp.	4	F, Sp Pre: Math 1210	Co: BME 1000
Total Semester Credits:	18		
Sophomore (Semester 3)			
MICR 2054 — Prin. of Microbio.	4	F, Sp, Su	Co: CHEM 1210
ECE 1270 — Intro. to Elec. Circuits	4	F, Sp Pre: Math 1210	Co: Math 1220, BME 1000
ECE 2700 — Digital Circuits	4	F, Sp	Co: BME 1000
BME 2000 — BME Seminar	1	Sp Pre: BME 1000	
ENGL 2010 — Int. Writing	3	F, Sp, Su	
Total Semester Credits:	16		
Sophomore (Semester 4)			
ENGR 2240 — Dyn. Sys. Eng.	4	Sp Pre: Math 1220, ECE 1270, ECE 1400	
CHEM 1220 — Chemistry II	4	F, Sp, Su	

CHEM 1225 — Chemistry II Lab	1	F, Sp, Su	
ECE 2260 — Fund. of Elec. Circ.	4	Sp Pre: Math 1220, ECE 1270	Co: ENGR 2240, ECE 1400
Gen. Ed. — AI	3	F, Sp, Su	
LIBS 1704 — Info. Nav.	1	F, Sp, Su	
Total Semester Credits:	17		
Junior (Semester 5)			
CHEM 2310 — Org. Chem. I	4	F, Sp, Su	
CHEM 2310 — Org. Chem. Lab I	1	F, Sp, Su	
BME 3000 — Eng. Seminar	1	F Pre: BME 2000	
BME 3130 — Microelec. for BME	4	F Pre: ECE 2260	
BME 3210 — Sig. and Systems	4	F Pre: ENGR 2240, ECE 2260	
PUBH 3500 — Biomed. Research Supp.	2	F	
Total Semester Credits:	16		
Junior (Semester 6)			
ECE 3430 — Eng. Prob. and Stats.	3	Sp Pre: Math 1220, ECE 1400	
ECE 3710 — Embedded Sys.	4	Sp Pre: ECE 1400, ECE 2700	
ECE 3090 — Project Mgmt.	1	F, Sp	
BME 3600 — BME Design	4	Sp Pre: BME 2000, PHYS 2220	
ECE 3890 — Internship	1	F, Sp, Su	
BME 3090 — Project Mgmt.	1	Sp	
Total Semester Credits:	14		
Senior (Semester 7)			
BME 4010 — Sr. Proj. I	2	F, Sp	
BME 5XXX — Sr. Elec. I	3	F, Sp	
BME 5XXX — Sr. Elec. II	3	F, Sp	
HTHS 1104 — Anantomy and Phys.	3	F, Sp, Su	
COMM 2110 — Group Comm.	3	F, Sp, Su	
Total Semester Credits:	14		
Senior (Semester 8)			
BME 4020 — Sr. Proj. II	2	F, Sp	
BME 5XXX — Sr. Elec. III	3	F, Sp	
BME 5XXX — Sr. Elec. IV	3	F, Sp	
ECON 2010 — Prin. of Microecon.	3	F, Sp, Su	
Gen. Ed. — CA or HU/CC	3	F, Sp, Su	
Total Semester Credits:	14		
Total Bachelor Credits:	126		

Acceptable Senior Electives are given below. Senior Electives are usually taught on an every-other-year basis.

Course	Cr.	Prerequisites
CHEM 3070 — Biochemistry I	3	Pre: CHEM 2310, CHEM2315
CHEM 3080 — Biochemistry II	3	Pre: CHEM 2320, CHEM2325, CHEM 3070
CS 5600 — Machine Learning	3	Pre: CS 2420
CS 5610 — Computer Architecture	3	Pre: ECE 3710
ECE 3310 — Electromagnetics I	4	Pre: MATH 2210, PHYS 2220, ECE 1270

ECE 3610 — Digital Systems	4	Pre: ECE 2700, ECE 1400
ECE 3710 — Embedded Systems	4	Pre: ECE 2700, ECE 1400 Co: ENGL 3100 or PS 3250
ECE 5110 — Digital VLSI Design	3	Pre: ECE 3110, ECE 3610
ECE 5130 — Advanced Semiconductor Devices	3	Pre: PHYS 2220, ECE 3110
ECE 5140 — Sensors and Instrumentation	3	Pre: PHYS 2220, ECE 3110
ECE 5150 — Thin Film Engineering	3	Pre: PHYS 2220, ECE 3430
ECE 5210 — Digital Signal Processing	4	Pre: ECE 3210
ECE 5220 — Image Processing	3	Pre: ECE 3210
ECE 5230 — Engineering Applications in Deep Learning	3	Pre: ECE 3210, ECE 3430
ECE 5320 — Antennas and Wave Propagation	3	Pre: ECE 3310
ECE 5410 — Communication Circuits and Systems	3	Pre: ECE 3210, ECE 3430
ECE 5420 — Digital Communication	3	Pre: ECE 3210, ECE 3430
ECE 5440 — Optical Communication Systems	3	Pre: ECE 3310
ECE 5510 — Advanced Power Systems	3	Pre: ECE 3510
ECE 5640 — Model-based Systems Engineering	3	Pre: ECE 3610
ECE 5710 — Real-Time Systems	4	Pre: ECE 3710
ECE 5730 — Robotics	4	Pre: ECE 3730, ECE 4100
ECE 5750 — Quantum Computing Engineering	3	Pre: ECE 2700, ECE 2220, ECE 3430, ENGR 2240
MICR 3254 — Immunology	3	Pre: MICR 2054
MICR 3305 — Medical Microbiology	5	Pre: MICR 2054
MICR 4354 — Industrial Microbiology and Biotechnology	4	Pre: MICR 4354, CHEM 1220
NEUR 3850 — Clinical Neuroscience	3	Pre: NEUR 2950 or NEUR 2050
NEUR 3950 — Cellular and Molecular Neuroscience	3	Pre: NEUR 2950 or NEUR 2050

Note: at most, one 3000-level course can be an acceptable Senior Level elective.

3.2.4 Five-Year BS/MS Programs

Both the Electrical and Computer Engineering BS programs are designed to mesh with their corresponding MS programs to make it possible to complete a BS degree and an MS degree in 5 years (150 credits). Students must maintain a GPA of at least 3.0 and must still apply for admission to graduate school, but they need not supply transcripts or take the GRE.

Most senior electives offered by the department are cross-listed with graduate courses with a similar number. For example, ECE 5710 and ECE 6710 are both titled "Real-Time Systems," but ECE 5710 is a senior elective, and ECE 6710 is a graduate course. Both are taught at the same time and place, but the students in the graduate course are required to do additional work commensurate with the graduate level. Undergraduate students can take up to 2 graduate courses (a maximum of 6 credits) and count them toward their undergraduate and graduate degrees.

Students in the MS program may choose the option of writing a thesis, doing a project or taking additional courses. Those students who plan to pursue a graduate degree with the project option may select an undergraduate capstone project that will transition into a Master's project.

3.2.5 Dual Majors

Students may earn a second bachelor's degree in EE, CE, or BME in conjunction with or after completing one EE, CE, or BME degree with the following provisos:

- The senior project may, with departmental approval, be shared between two degrees if it is (was) applicable to both. BME students must see an advisor to slot BME 4010/4020 instead of ECE 4010/4020 or vice versa.
- At most two 5000-level elective courses may be shared. (i.e., up to two 5000-level elective courses may be slotted simultaneously in both programs.) Courses that are not 5000-level may not be shared. Also, any course that fills a non-elective requirement in one program may not count as an elective in another.
- For students pursuing a second degree in Biomedical Engineering, at least one of the electives must come from outside the ECE department. (If the biomedical degree was initially completed without such a course, the student must take the outside course and count one of the prior electives as a non-shared elective for the EE or CE degree.)
- Students may not earn a triple major of Electrical, Computer, and Biomedical Engineering

3.2.6 Independent Studies

Independent studies are available to students who wish to pursue a topic not covered in the regular curriculum. The student must find a faculty member willing to supervise the study and must submit a proposal to the department chair for approval by the ECE Department faculty. The proposal must include a description of the work to be done, the expected outcome, and the method of evaluation. The student must meet with the faculty member at least once a week and must submit a written report at the end of the semester. The number of credits earned is determined by the amount of work done, but the maximum is 3 credits per semester. Independent studies may not be used to satisfy the senior project requirement.

Chapter 4

Department Academic Policies

4.1 Advising

4.1.1 Pre-Professional Program

We recognize the importance of providing a seamless and supportive academic pathway for students aspiring to excel in Electrical Engineering, Computer Engineering, and Biomedical Engineering. The Pre-Professional Program in ECE has been meticulously designed to serve as a foundational bridge, allowing students to transition smoothly into their chosen major. Upon declaring their EE, CE, or BME major, students gain access to the Pre-Professional Program, allowing them to enroll in 1000- and 2000-level courses within the ECE department.

The Pre-Professional Program in ECE aims to cultivate a robust educational foundation for future engineers. By enrolling in 1000- and 2000-level courses, students engage with fundamental electrical and computer engineering concepts, laying the groundwork for advanced studies and specialization in their respective majors. This early exposure to essential topics such as circuits, digital systems, and programming languages equips students with the skills and knowledge necessary to tackle more complex challenges as they progress in their academic journey.

Moreover, being a part of the Pre-Professional Program provides students with a supportive community of peers with similar interests and goals. Through collaborative projects, hands-on laboratories, and mentorship opportunities, students can enhance their problem-solving abilities and develop a keen understanding of real-world electrical, computer, or biomedical engineering applications.

The Pre-Professional Program in ECE ensures students receive personalized guidance from experienced faculty advisors. These advisors offer academic support, mentorship, and career guidance, empowering students to make informed decisions about their academic and professional trajectories. Additionally, the program facilitates interactions with industry professionals, research opportunities, and participation in engineering-related extracurricular activities, fostering a well-rounded educational experience.

4.1.2 Professional Program

The Professional Program represents the advanced phase of academic studies for students majoring in Electrical Engineering and Computer Engineering. Students transition from general EE, CE, and BME coursework to more specialized courses during their junior and senior years. Students

must be admitted into the Professional Program to access these courses.

Upon completing the Pre-Professional Program, students must apply for acceptance into the Professional Program. Admission is competitive, and applicants must maintain a minimum Grade Point Average (GPA) of 2.8 in the Pre-Professional Required Courses. This eligibility criterion ensures a solid understanding of fundamental concepts and consistent academic performance.

Admittance into the Professional Program signifies a student's readiness for in-depth exploration of their chosen discipline. Under the guidance of faculty mentors, students engage in advanced coursework covering topics such as circuits, electronics, signal processing, programming languages, and hardware design. Practical experiences, including internships, projects, and research, enhance students' skills and prepare them for electrical and computer engineering professional challenges.

The Professional Program represents a commitment to academic excellence and rigorous training, providing students with the knowledge and practical expertise necessary for successful Electrical and Computer Engineering careers.

Students in the Professional Program are encouraged to meeting with the program coordinator regularly to discuss their academic progress, career goals, and course selection. These interactions foster a supportive environment where students can receive guidance, mentorship, and resources to navigate their academic journey effectively.

The following is required for admittance into the Professional Program:

- 2.8 GPA in the Pre-Professional Engineering courses
- C or better in all Pre-Professional Engineering courses

Required EE Pre-Professional Program courses

- CHEM 1230 - Engineering Chemistry
- CHEM 1235 - Engineering Chemistry Lab
- MATH 1210 - Calculus I
- MATH 1220 - Calculus II
- MATH 2210 - Calculus III
- ENGR 2240 - Dynamic Systems Engineering (or MATH 2250 or both MATH 2270 and MATH 2280)
- PHYS 2210 - Physics for Scientists and Engineers I
- PHYS 2220 - Physics for Scientists and Engineers II
- ECE 1000 - Introduction to Electrical Engineering (or ENGR 1000)
- ECE 1270 - Introduction to Electrical Circuits
- ECE 1400 - Fundamentals of Engineering Computing
- ECE 2260 - Fundamentals of Electrical Circuits
- ECE 2700 - Digital Circuits

Required CE Pre-Professional Program courses

- CS 1410 - Structured Computing in a Selected Language
- MATH 1210 - Calculus I
- MATH 1220 - Calculus II
- ENGR 2240 - Dynamic Systems Engineering (or MATH 2250 or both MATH 2270 and MATH 2280)
- PHYS 2210 - Physics for Scientists and Engineers I
- PHYS 2220 - Physics for Scientists and Engineers II
- ECE 1000 - Introduction to Electrical Engineering (or ENGR 1000)
- ECE 1270 - Introduction to Electrical Circuits
- ECE 1400 - Fundamentals of Engineering Computing
- ECE 2260 - Fundamentals of Electrical Circuits
- ECE 2700 - Digital Circuits

Required BME Pre-Professional Program courses

- MATH 1210 - Calculus I
- MATH 1220 - Calculus II
- CHEM 1210 - Principles of Chemistry I
- CHEM 1215 - Principles of Chemistry I Lab
- PHYS 2210 - Physics for Scientists and Engineers I
- PHYS 2220 - Physics for Scientists and Engineers II
- MICR 2054 - Principles of Microbiology
- BME 1000 - Introduction to Biomedical Engineering (or ECE 1000 or ENGR 1000)
- ECE 1270 - Introduction to Electrical Circuits
- ECE 1400 - Fundamentals of Engineering Computing
- ECE 2260 - Fundamentals of Electrical Circuits
- ECE 2700 - Digital Circuits
- BME 2000 - BME Sophomore Seminar
- ENGR 2240 - Dynamic Systems Engineering (or MATH 2250 or both MATH 2270 and MATH 2280)

If you have completed the required courses, please submit the completed application form to Dr. Eric Gibbons or Judy Smith.

You may apply to the Professional Program before completing all the required courses in the Pre-Professional Program. This preliminary acceptance is contingent on completing the required courses with a C grade or better. A preliminary acceptance to the Professional Program will allow

you to enroll in upper-division courses. If you have not completed a course in the pre-professional program, list the grade as a C when filling out the application and include that placeholder grade when computing your GPA. A GPA of 2.8 is still required for acceptance to the professional program. If your GPA falls below 2.8 with these placeholder C grades, wait until you have the final grades after taking the courses before you apply.

If you are a transfer student, please contact the program coordinator or advisors for instructions on how to complete the application.

4.1.3 Dismissal from the program

We are deeply committed to nurturing our students' academic growth and success within the ECE Program. To maintain the rigorous standards and high-quality education our program offers, there is a specific policy concerning the repetition of courses.

If a student is in the Pre-Professional program and fails to pass a course (with a grade of C or higher) a third time, the student will not be eligible for admission into the Professional Program. If a student is in the Professional Program and fails to pass a course (with a grade of C or higher) a third time, the student will be removed from the Professional Program and will not be allowed to take any further ECE courses.

By upholding this standard, we provide a clear educational pathway to graduation, ensuring that our graduates from Weber State University are well-prepared and knowledgeable as they embark on a career in industry.

The policy encourages students to utilize the comprehensive support services available at Weber State University. We believe in offering a robust support system, including academic advising, tutoring, and counseling, to help students overcome obstacles and thrive in their studies. Seeking assistance promptly often enables students to address their concerns effectively, preventing the need for course repetition and allowing them to maintain their progress in the ECE Programs.

There is an established appeals process when students face exceptional circumstances that may have affected their academic performance. Students can provide relevant documentation and appeal to the Academic Review Board, ensuring that individual cases are thoroughly examined and decisions are made fairly and equitably.

By adhering to this policy, we uphold the reputation and integrity of Weber State University's ECE Programs. This commitment ensures that our graduates possess exceptional technical skills and demonstrate resilience, determination, and adaptability, making them well-prepared for the challenges of the professional world in Electrical, Computer, and Biomedical Engineering.

4.2 Academic integrity

In the ECE Department, we uphold the highest academic integrity and ethical conduct standards. As future engineers and innovators, it is paramount that our students understand the significance of maintaining honesty, trust, and respect within the academic community. Academic integrity violations undermine our department's core values and erode the foundation upon which our educational system is built.

One of our department's specific areas of concern is the unauthorized sharing of course materials, including source code, assignments, and project files. While collaboration and knowledge sharing are encouraged within the boundaries of each course, students must recognize the importance of respecting the intellectual property rights associated with their coursework. This includes refrain-

ing from publicly posting course code or any other class-related materials, even after the course has concluded.

4.2.1 Consequences

Academic integrity violations are treated with the utmost seriousness in the ECE Department. Such actions compromise the learning process, diminish the value of the education received, and can lead to severe consequences. Students violating these policies may face disciplinary measures ranging from receiving a failing grade for the assignment or course to suspension or expulsion from the university. Additionally, academic integrity violations tarnish students' reputations, potentially impacting their future career prospects and professional relationships.

4.2.2 Promoting a culture of integrity and responsibility

To promote a culture of academic integrity and responsibility, the ECE Department emphasizes the importance of understanding and abiding by university policies related to plagiarism, cheating, and unauthorized distribution of course materials. Faculty members employ various tools and techniques, including plagiarism detection software, to identify potential violations and ensure a fair and just academic environment for all students.

Furthermore, students are encouraged to actively engage with the principles of academic integrity and seek guidance from faculty members and academic advisors if they are uncertain about the appropriate collaboration and knowledge-sharing boundaries. By fostering an environment of open communication, mutual respect, and ethical conduct, we can collectively uphold the integrity of our department and nurture a community of engineers who are not only technically proficient but also ethically responsible leaders in their field.

4.2.3 Examples of academic misbehavior

The following is an incomplete list of examples of academic misbehavior. Please note that this list is not exhaustive, and other forms of academic integrity violations may occur. It serves as a handful of examples to highlight the various violations students should be aware of.

- Plagiarism: Presenting someone else's work, ideas, or intellectual property as one's own without proper citation.
- Cheating on Exams: Using unauthorized materials, devices, or communication during exams to gain an unfair advantage.
- Unauthorized Collaboration: Working together on assignments, projects, or exams without explicit permission from the instructor.
- Fabrication: Creating false data, citations, or information to support one's academic work.
- Submitting Work from Previous Semesters: Submitting work previously graded for another course without the current instructor's consent.
- Using Someone Else's Code or Design Without Attribution: Utilizing programming code, circuit designs, or other intellectual property created by others without proper acknowledgment.
- Breach of Exam Security: Sharing exam questions, answers, or other sensitive information with students who have not yet taken the exam.

- Forging Signatures or Approval: Falsifying signatures, approval, or any official documents related to academic processes.
- Unauthorized Access to Exam or Grading Systems: Gaining unauthorized access to exam papers, grading systems, or any other secure academic information.
- Publicly Posting Course Materials: Posting old course materials, solutions, or code, even after the course is complete.