

COMPUTER ENGINEERING – EMBEDDED & IoT SYSTEMS CONCENTRATION

CURRICULUM GUIDE

Fall 2023 – Spring 2024

1. **REQUIRED TOTAL CREDITS**

Computer Engineering – Networks and Data Concentration: 126 credits

A minimum of 42 upper-division semester credits (300-400 level) are required of all students completing a bachelor's degree program at CSU. A minimum of 30 upper-division semester credits must be completed in residence at CSU as a major in the College of Engineering. Elective credits taken at the 500-level may be used to fulfill this requirement. Courses at the 600-level may not be used to fulfill undergraduate degree requirements per CSU Policy.

2. **GRADE REQUIREMENTS**

University – 2.00 Cumulative GPA

All-University Core Curriculum (AUCC) – 2.00 GPA

College of Engineering – 2.00 GPA in all required engineering, math, chemistry and physics courses.

ECE Courses – 2.00 GPA in all ECE courses

ECE Department – ECE courses **required for the major** at the 100, 200, and 300 level must be passed with a minimum grade of C; grades below a C will require the student to retake the course. Students receiving a grade below C will not be allowed to take any ECE course for which that course is a prerequisite until such time as the minimum grade of C requirement is met. ECE courses designated as an elective are exempt from the C or higher minimum grade requirement.

All courses must be taken for a grade. The original grade and grades earned in repeated courses are used in calculating grade point averages unless a student exercises the Repeat/Repair policy:

<https://registrar.colostate.edu/academic-resources/repeat-delete/>.

3. **COURSE PREREQUISITES**

All course prerequisites for 100-, 200-, 300- and 400-level required ECE courses must be completed with a C or higher. This includes all ECE, CS, PH and MATH prerequisite courses including CS152, CS162, CS164, PH142, MATH160, MATH161, MATH261, and MATH340.

For courses taken outside of the ECE department, students must meet all grade minimums and prerequisites set by the department sponsoring the course.

Students are responsible for knowing and fulfilling the requirements for course prerequisites, co-requisites, and graduation. These requirements are listed on the [ECE website](#), in the General Catalog and each semester's course schedule located in RAMweb.

4. **TECHNICAL ELECTIVES** – 13-16 credits

Courses used to fulfill major and concentration requirements will not be counted as technical elective credit. Choose from the list of courses found on the Computer Engineering Technical Elective list: <https://www.engr.colostate.edu/ece/undergraduates/degree-programs/computer-engineering-with-embedded-and-iot-systems/>.

Alternative courses may be taken with prior written approval of the ECE Curriculum Committee. Submit the *Request for Waiver or Substitution of ECE Department Graduation Requirements* to the department academic advisor to request approval:

<https://www.engr.colostate.edu/ece/undergraduates/advising/>. Students must attach an explanation of their request and supporting documentation (i.e. course syllabus for the transfer course, communications/emails regarding course evaluations, etc.).

5. COMPUTER ENGINEERING ELECTIVES – 0-3 credits

Computer engineering elective credits may be satisfied by completing courses listed on the ECE website: <https://www.engr.colostate.edu/ece/undergraduates/degree-programs/computer-engineering-with-embedded-and-iot-systems/>

6. ALL-UNIVERSITY CORE CURRICULUM (AUCC)

All CSU students share a common learning experience and incorporate AUCC courses. The specific courses listed below are required for the ECE curriculum while satisfying AUCC requirements. In some cases, the credits exceed the AUCC minimum requirements for core curriculum credits.

<i>All-University Core Curriculum</i>	<i>Credit Requirement</i>	<i>ECE – REQUIRED AUCC Course</i>
Category 1 – Basic Competencies		
A – Intermediate Writing	3	CO150 (Honors Program students substitute HONR193)
B – Mathematics	3	MATH160
C – Diversity, Equity, and Inclusion	3	Choose from list available in the General Catalog or Class Schedule
Category 2 – Advanced Writing	3	CO301B OR JTC300
Category 3 – Foundations & Perspectives		
A – Biological/Physical Sciences	7	PH141 AND Choose a minimum of 3 credits from list on the ECE website
B – Arts & Humanities	6	CS150B AND Choose from list available in the General Catalog or Class Schedule (maximum of 3 credits of intermediate foreign language)
C – Social/Behavioral Sciences	3	ECON202
D – Historical Perspectives	3	Choose from list available in the General Catalog or Class Schedule

7. TRANSFER COURSEWORK

Students who wish to seek transfer credit from another institution for an ECE course or major requirement should contact their academic advisor. ECE faculty who teach the course for the proposed equivalency or substitution will evaluate course materials provided by the student (i.e. course syllabus, course description, and other documentation) to determine if equivalency or substitution is warranted. If the course is outside of the ECE department (CS, PH, MATH, etc.), the student must work with the department sponsoring the course to get the course materials evaluated.

Students must submit the *Request for Waiver or Substitution of ECE Department Graduation Requirements* form to the ECE department academic advisor to request approval:

<https://www.engr.colostate.edu/ece/undergraduates/advising/>. Students must attach an explanation of their request and supporting documentation (i.e. course syllabus for the transfer course and CSU course, communications/emails regarding course evaluations, etc.).

8. DEGREE PROGRESS AUDIT IN RAMweb:

The Degree Progress Audit provides each student an individualized audit reflecting their progression through their degree program and serves as the graduation contract for all undergraduate students. A Degree Progress Audit verifies the completion of University Core Curriculum (AUCC), program, minor, and concentration requirements. The audit provides a dynamic report showing all courses required for the degree and includes how all transfer and CSU courses count towards a student's degree. To access the Degree Progress Audit:

1. Log into RAMweb
2. Select "Degree Progress Audit (DARS)" under the Academic Planning and Progress section
3. Sign in with your NetID and NetPassword
4. Always run a new audit to have the most accurate audit

Degree Progress Audit information can be found at: <https://registrar.colostate.edu/degree-progress-audit/>

9. INTERNSHIPS & CO-OPS

Internships and Co-ops (Cooperative Education Programs) allow students to further explore their chosen engineering discipline, build a powerful resume, develop a network of professional contacts, and help support their academic expenses. Internships are not credit bearing and do not have an academic component. The College of Engineering encourages students to complete an internship experience and a high percentage of students choose to participate in at least one internship. For approved Co-ops, students work at least one year with the same employer over at least 3 semesters. Students gain three (3) academic credits that can be used as technical electives and students are required to pay tuition for the credits.

For more information on internships and Co-ops: <https://www.engr.colostate.edu/engineering-success-center/co-op/>

10. ACCELERATED MASTER'S PROGRAM – AMP (Accelerated B.S./M.S. or B.S./Ph.D.)

Exceptional undergraduate students may be recruited to the accelerated bachelor's/master's or bachelor's/doctoral degree programs. Students completing the Computer Engineering Networks and Data concentration enrolled in AMP may double count up to nine (9) 500-level credits with a grade of B or better toward both the bachelor/master or bachelor/Ph.D. degrees. For more information on application procedures/requirements and minimum GPA requirements:

<https://www.engr.colostate.edu/ece/undergraduates/degree-programs/>.

11. EDUCATION ABROAD

Engineering students at CSU have many opportunities to participate in international experiences, whether that's short-term or a semester. These programs can last a week to a year and include study, research, internships, service learning, and other opportunities. To learn more about Education Abroad opportunities: <https://international.colostate.edu/educationabroad/>.