ECE & CS Tech Electives by Subfields

This section contains ECE and CS technical electives, as well as a few courses that are only required for some ECE students. Note that CompE's can choose from both CS and ECE electives for the majority of their technical electives, whereas EEs only get to take ECE tech electives. Also note that all Graduate ECE Courses can be counted towards the ECE tech elective requirements.

A note on the graphs:

**Legend:**
- Arrow means "is a prerequisite for".
- Dotted arrow means "is a corequisite for".
- All nodes represent classes, with the exception of root, Junior Standing, and Senior Standing.
- Colors: red is required, orange is required for EE or CompE, blue is ECE tech elective, green is 3 of 5, and cyan is CS tech elective.

Tips: hover over any class to see the class' title; click on a class to visit the corresponding DEN article (when one exists).

**Subfields:**
- Biomedical Imaging, Bioengineering, and Acoustics
- Communications
- Computer Engineering: Architecture / Digital Logic
- Computer Engineering: Artificial Intelligence
- Computer Engineering: Networking
- Computer Science: Data Systems
- Computer Science: Graphics & HCI
- Computer Science: Numerical Analysis and Scientific Computing
- Computer Science: Parallel Programming
- Computer Science: Programming Languages and Compilers
- Computer Science: Programming and Software Engineering
- Computer Science: Security & Information Assurance
- Computer Science: Systems
- Computer Science: Theory
- Control Systems
- Electromagnetics, Optics and Remote Sensing
- Integrated Circuits and Systems
- Microelectronics and Photonics
- Power and Energy Systems
- Signal Processing

**Biomedical Imaging, Bioengineering, and Acoustics**
- ECE 416 - Biosensors (same as BIOE 416)
- ECE 380 - Biomedical Imaging (same as BIOE 380)
- ECE 402 - Electronic Music Synthesis
- ECE 403 - Audio Engineering
- ECE 414 - Biomedical Instrumentation (same as BIOE 414)
- ECE 415 - Biomedical Instrumentation Lab (same as BIOE 415)
- ECE 467 - Biophotonics (same as BIOE 467)
- ECE 472 - Biomedical Ultrasound Imaging
- ECE 473 - Fund of Engrg Acoustics (same as TAM 413)
- ECE 480 - Magnetic Resonance Imaging (same as BIOE 480)
- ECE 493 - Advanced Engineering Math (same as MATH 487)

**Communications**
- ECE 361 - Fundamentals of Digital Communications
- ECE 459 - Communications Systems
- ECE 463 - Digital Communications Lab
- ECE 465 - Optical Communications Systems
- ECE 466 - Optical Communications Lab

**Computer Engineering: Architecture / Digital Logic**
- CS 433 - Computer System Organization (same as CSE 422)
- ECE 395 - Advanced Digital Systems Laboratory
- ECE 411 - Computer Organization and Design
- ECE 425 - Intro to VLSI System Design
- ECE 462 - Logic Design

**Computer Engineering: Artificial Intelligence**
- CS 440 - Artificial Intelligence (same as ECE 448)
- CS 446 - Machine Learning
- ECE 470 - Introduction to Robotics (same as AE 482 and ME 445)
- CS 498 - Applied Machine Learning
- CS 498 - Introduction to Deep Learning

**Computer Engineering: Networking**
- CS 438 - Communication Networks (same as ECE 438)
- ECE 435 - Computer Networking Laboratory (same as CS 436)
- ECE 439 - Wireless Networks (same as CS 439)

**Computer Science: Data Systems**
- CS 410 - Text Information Systems
- CS 411 - Database Systems
- CS 412 - Introduction to Data Mining

**Computer Science: Graphics & HCI**
- CS 418 - Interactive Computer Graphics (same as CSE 427)
- CS 419 - Production Computer Graphics
- CS 465 - User Interface Design
- CS 467 - Social Visualization

**Computer Science: Numerical Analysis and Scientific Computing**
- CS 357 - Numerical Methods I (same as MATH 357)
- CS 450 - Numerical Analysis (same as ECE 491, MATH 450, and CSE 401)
- IE 410 - Stochastic Processes & Applic (same as CS 481)

**Computer Science: Parallel Programming**
- CS 420 - Parallel Progrmg: Sci & Engrg (same as ECE 492 and CSE 402)
- ECE 408 - Applied Parallel Programming (same as CS 483)

**Computer Science: Programming Languages and Compilers**
- CS 421 - Progrmg Languages & Compilers
- CS 422 - Programming Language Design
- CS 426 - Compiler Construction

**Computer Science: Programming and Software Engineering**
- CS 225 - Data Structures
- CS 242 - Programming Studio
- CS 427 - Software Engineering I (same as CSE 426)
- CS 428 - Software Engineering II (same as CSE 429)
- CS 429 - Software Engineering II ACP
- CS 476 - Program Verification
Computer Science: Security & Information Assurance

- CS 460 - Security Laboratory (same as ECE 419)
- CS 461 - Computer Security I (same as ECE 422)
- CS 463 - Computer Security II (same as ECE 424)

Computer Science: Systems

- CS 414 - Multimedia Systems
- CS 423 - Operating Systems Design (same as CSE 423)
- CS 424 - Real-Time Systems
- CS 425 - Distributed Systems (same as ECE 428)
- CS 431 - Embedded Systems
- ECE 391 - Computer Systems Engineering

Computer Science: Theory

- CS 173 - Discrete Structures
- CS 374 - Intro to Algorithms
- CS 473 - Fundamental Algorithms (same as CSE 414 and MATH 473)
- CS 477 - Formal Software Development Methods (same as ECE 478)

Control Systems

- ECE 486 - Control Systems
- ECE 490 - Introduction to Optimization (same as CSE 441)

Electromagnetics, Optics and Remote Sensing

- ECE 454 - Antennas
- ECE 455 - Active Microwave Ckt Design
- ECE 451 - Adv Microwave Measurements
- ECE 452 - Electromagnetic Fields and Electro-Optics
- ECE 453 - Wireless Communication Systems
- ECE 456 - Global Nav Satellite Systems
- ECE 457 - Microwave Devices and Circuits
- ECE 458 - Applic of Radio Wave Propag
- ECE 460 - Optical Imaging
- ECE 468 - Optical Remote Sensing (same as AE 468)

Integrated Circuits and Systems

- ECE 342 - Electronic Circuits
- ECE 343 - Electronic Circuits Laboratory
- ECE 482 - Digital IC Design
- ECE 483 - Analog IC Design

Microelectronics and Photonics

- ECE 304 - Photonic Devices
- ECE 441 - Physics & Modeling Semicond Dev
- ECE 444 - Theory and Fabrication of Integrated Circuits
- ECE 455 - Optical Electronics
- ECE 481 - Nanotechnology
- ECE 484 - Ptn Adv Microelec Processing
- ECE 485 - MEMS Devices & Systems (same as ME 485)
- ECE 487 - Intro to Quantum Electr for EEs
• ECE 488 - Compound Semicond & Devices
• ECE 495 - Photonic Device Laboratory

Power and Energy Systems

• ECE 330 - Power Circuits and Electromechanics
• ECE 333 - Green Electric Energy
• ECE 431 - Electric Machinery
• ECE 432 - Advanced Electric Machinery
• ECE 464 - Power Electronics
• ECE 469 - Power Electronics Laboratory
• ECE 476 - Power System Analysis

Signal Processing

• ECE 310 - Digital Signal Processing
• ECE 311 - Digital Signal Processing Lab
• ECE 417 - Multimedia Signal Processing
• ECE 418 - Image & Video Processing
• ECE 420 - Embedded DSP Laboratory