**Electrical Engineering**
**Career Plan Electives**
***(2024-2025 catalog year)***

Will you start working immediately after graduation in industry, the government sector or non-profit or will you apply to a graduate program (MS, PhD, law, MBA, medical school)?

We recognize it is difficult to decide and plan on what you will be involved in and do as a professional for many decades in the future. Consider what drives you; your interests and passion could inform your decision. Does working on wireless communication or power systems or radio frequency (RF) systems excite you? Or is it Microelectronics or Control or Signal Integrity? The answers to these questions can help you decide on what elective courses to take.

You may have already participated or participating in research with faculty or may have done an internship with a company or in a government lab. Those experiences can help you decide on your area of specialization within electrical engineering. You may also wish to broaden your scope of knowledge and opportunities by taking some courses from other disciplines that are not necessarily engineering or science. Those could be from finance, management, marketing etc.

Based on your chosen specialization you will select **18** hours of career plan elective courses. If you wish, you can select all your career plan elective courses from a list of ELCT courses (all ELCT courses numbered 430 and higher). You also have the option to take up to **6** credit hours of non-ELCT courses at the 300-level or higher with department approval.

## Current ELCT Elective Courses

| Course # | Course Title: | Semester: |
|---|---|---|
| ELCT 430 | Industrial Controls | Fall |
| ELCT 432 | Fundamentals of Communication Systems | Fall |
| ELCT 451 | Power Systems Design and Analysis | Fall |
| ELCT 510 | Photovoltaic Materials and Devices | Spring |
| ELCT 521 | Introduction to Microwave Engineering | Spring |
| ELCT 531 | Digital Control Systems | Spring |
| ELCT 533 | System Health Management | Spring |
| ELCT 553 | Electromechanical Energy Conversion | Spring |
| ELCT 554 | Integration of Photovoltaics in Modern Power Systems | Spring or Fall |
| ELCT 562 | Wireless Communications | Spring |
| ELCT 563 | Semiconductor Devices for Power, Communications and Lighting | Fall |
| ELCT 564 | RF Circuit Design for Wireless Communications | Fall |
| ELCT 572 | Power Electronics | Fall |
| ELCT 574 | Semiconductor Materials & Device Characterization | Fall or Spring |

*Courses on list may change or may not be offered every semester or every year as indicated

## Sample Career Plans Examples

Here are some sample Career Plan examples of courses based on specialization areas. These should be considered as examples and not as rules or directions. You will receive guidance during the advisement process and we recommend speaking with one of the department's Faculty Advising Fellows about this.

## For Specialization in

### Wireless Communications and RF Circuits/Systems

| | |
|---|---|
| ELCT 432 | Fundamentals of Communication Systems |
| ELCT 510 | Photovoltaic Materials and Devices |
| ELCT 521 | Introduction to Microwaves |
| ELCT 562 | Wireless Communications |
| ELCT 563 | Semiconductor Devices for Power, Communications and Lighting |
| ELCT 564 | RF Circuit Design for Wireless Communications |

### Power, Energy and Control (Power Electronics; Control & Automation)

| | |
|---|---|
| ELCT 430 | Industrial Controls |
| ELCT 451 | Power Systems Design and Analysis |
| ELCT 531 | Digital Control Systems |
| ELCT 554 | Integration of Photovoltaics in Modern Power Systems |
| ELCT 563 | Semiconductor Devices for Power, Communications and Lighting |
| ELCT 572 | Power Electronics |

### Electronic Devices and Materials (Microelectronics & Signal Integrity System)

| | |
|---|---|
| ELCT 510 | Photovoltaic Materials and Devices |
| ELCT 521 | Introduction to Microwaves |
| ELCT 563 | Semiconductor Devices for Power, Communications and Lighting |
| ELCT 564 | RF Circuit Design for Wireless Communications |
| ELCT 554 | Integration of Photovoltaics in Modern Power Systems |
| ELCT 572 | Power Electronics |

## Non ELCT Courses and Other Specializations

You can develop your own specialization by choosing the appropriate ELCT career plan electives. In addition, you can take up to **6** credit hours of courses from departments outside of ELCT e.g., courses on software, business, marketing with the department's approval. Non-ELCT courses that have been preapproved by the department are listed below. **Please be aware that courses may have prerequisites that you may need to meet.** To request approval of courses not on this list, contact the Electrical Engineering Department

### Non-ELCT Course List

| | |
|---|---|
| AESP 350 | Aerospace Systems |
| CSCE 317 | Computer Systems Engineering |
| CSCE 416 | Introduction to Computer Networks |
| CSCE 513 | Computer Architecture |
| CSCE 516 | Computer Networks |
| CSCE 548 | Building Secure Software |
| CSCE 552 | Computer Game Development |
| CSCE 567 | Visualization Tools |
| CSCE 574 | Robotics |
| CSCE 587 | Big Data Analytics |
| ECHE 310 | Introductory Chemical Engineering Thermodynamics |
| ECHE 311 | Chemical Engineering Thermodynamics |
| ECHE 567 | Process Safety, Health and Loss Prevention |
| ECON 421 | Engineering Economics |
| EMCH 310 | Dynamics |

| | |
|---|---|
| EMCH 354 | Heat Transfer |
| EMCH 371 | Materials |
| EMCH 441 | Automotive System Fundamentals |
| EMCH 550 | Introduction to Nuclear Safeguards |
| EMCH 552 | Introduction to Nuclear Engineering |
| EMCH 553 | Nuclear Fuel Cycles |
| EMCH 555 | Radiation Detection and Instrumentation |
| EMCH 556 | Introduction to Risk Analysis and Reactor Safety |
| EMCH 557 | Introduction to Radiation Shielding and Sources |
| EMCH 558 | Introduction to Nuclear Reactor Systems |
| EMCH 573 | Introduction to Nuclear Materials |
| ENCP 460 | Special Topics in Engineering and Computing |
| ENCP 530 | Cases in Technology Feasibility Analysis |
| ENCP 533 | Legal Aspects of Engineering and Innovation |
| FINA 333 | Finance and Markets |
| MATH 374 | Discrete Structures |
| MATH 524 | Nonlinear Optimization |
| MATH 526 | Numerical Linear Algebra |
| MATH 527 | Numerical Analysis |
| MATH 544 | Linear Algebra |
| MATH 546 | Algebraic Structures |
| MATH 550 | Vector Analysis |
| MATH 574 | Discrete Mathematics |
| MGMT 371 | Principles of Management |
| MKTG 350 | Principles of Marketing |
| MKTG 455 | Marketing Communications and Strategy |
| MKTG 457 | Introduction to Sales |
| MUSC 336 | Introduction to Computer Music |
| MUSC 365 | An Introduction to Audio Recording Techniques |
| PHYS 306 | Principles of Physics III |
| PHYS 307 | Introduction to Modern Physics |
| PHYS 599 | Topics in Physics |

**Military Courses for those students participating in program.**
***Only 1 course from this list below may count to fulfill the requirement.**

AERO 301 - Leading People and Effective Communication
AERO 302 - Leading People and Effective Communication II
NAVY 301 - Navigation/Naval Operations I
NAVY 302 - Navigation/Naval Operations II
NAVY 401 - Naval Leadership and Management I
NAVY 402 - Naval Leadership and Ethics
ARMY 401- The Army Officer and the Profession of Arms I
ARMY 402- The Army Officer and the Profession of Arms II