# Electrical Engineering Technical Electives 2019–2020 (7 required)

## GROUP A QUALIFIED ENGINEERING DESIGN ELECTIVE COURSES (3 required)

**FALL TERM 2019**

| Course | | Prerequisites | Cr. Hrs. |
|---|---|---|---|
| ECE 4290 | Microwave Engineering | ECE 3590 | 4 |
| ECE 4370 | Power Electronics | ECE 2160, ECE 3720 | 4 |

**WINTER TERM 2020**

| Course | | Prerequisites | Cr. Hrs. |
|---|---|---|---|
| ECE 4160 | Control Engineering | ECE 4150 | 4 |
| ECE 4250 | Digital Communications | ECE 4260, ECE 3780 | 4 |
| ECE 4830 | Signal Processing 2 | ECE 3780 | 4 |

## GROUP B TECHNICAL ELECTIVE COURSES

**FALL TERM 2019**

| Course | | Prerequisites | Cr. Hrs. |
|---|---|---|---|
| ECE 4240 | Microprocessor Interfacing | ECE 2160, ECE 3610 | 4 |
| ECE 4270 | Antennas | ECE 3590 | 4 |
| ECE 4300 | Electrical Energy Systems 1 | ECE 3650 | 4 |
| ECE 4390 | Engineering Computation 4E | MATH 3132, ECE 2240 | 4 |
| *ECE 4430* | *Design of RF Devices and Wireless Systems* | *ECE 3590* | *4* |
| *ECE 4450* | *Applied Computational Intelligence* | *MATH 3132* | *4* |
| ECE 4530 | Parallel Processing | COMP 2140, ECE 3760 | 4 |
| *ECE 4560* | *Modern Computing Systems* | *ECE 3610* | *4* |
| ECE 4540 | Wireless Networks | ECE 3700, ECE 3780 | 4 |
| ECE 4580 | Optoelectronics | ECE 3600 | 4 |
| ECE 4610 | Biomedical Instrumentation and Signal Processing | ECE 2160, ECE 3780 | 4 |
| ECE 4740 | Digital System Implementation | ECE 4240 | 4 |
| *ECE 4850* | *(T05) Basics of Biological Signals Analysis* | *ECE 3780* | *4* |
| COMP 1020 | Computer Science 2 | COMP 1012 | 3 |
| COMP 2140 | Data Structures and Algorithms | COMP 1020 | 3 |
| COMP 3190 | Introduction to Artificial Intelligence | COMP 2140 | 3 |
| MATH 3120 | Applied Discrete Mathematics | ECE 2220, MATH 2130 | 3 |
| PHYS 2260 | Optics | PHYS 2152, MATH 1510, MATH 1210, MATH 1710 | 3 |
| PHYS 4646 | Electro- and Magnetodynamics and Special Relativity | ECE 3590 and pre- or co-requisite of MATH 3132 | 3 |

**WINTER TERM 2020**

| Course | | Prerequisites | Cr. Hrs. |
|---|---|---|---|
| ECE 3650 | Electric Machines | ECE 3720 | 5 |
| ECE 3700 | Telecommunication Network Engineering | COMP 2140 | 4 |
| ECE 4100 | Microelectronic Fabrication | ECE 3670 | 4 |
| ECE 4180 | Introduction to Robotics | ECE 4150, (ECE 4240 or ECE 3730) | 4 |
| ECE 4310 | Electrical Energy Systems 2 | ECE 4150, ECE 4300 | 4 |
| ECE 4440 | Computer Vision | ECE 3780 | 4 |
| ECE 4860 | (T05) Materials Characterizations | Permission of the Instructor (D. Oliver) | 4 |
| ECE 4860 | (T08) Sensors, Instrumentation, and the IoT | ECE 2160 | 4 |
| *ECE 4860* | *(T09) Bioelectromagnetics* | *ECE 3590 or permission of the instructor (E. Salimi)* | *4* |
| COMP 1020 | Computer Science 2 | COMP 1012 | 3 |
| COMP 2140 | Data Structures and Algorithms | COMP 1020 | 3 |
| COMP 4360 | Machine Learning | COMP 3190 | 3 |
| MATH 3460 | Partial Differential Equations | Permission of the Department of Mathematics | 3 |
| PHYS 3220 | Medical Physics and Physiological Measurement | ECE 3580 | 3 |
| PHYS 4590 | Advanced Optics | PHYS 2260, PHYS 3640 | 3 |

## Elective Courses Not Offered in 2019–2020

| Course | | Prerequisites | Cr. Hrs. |
|---|---|---|---|
| ECE 3770 | Digital Systems Design 2 | ECE 4240 | 4 |
| ECE 4140 | Power Transmission Lines | ECE 3720 | 4 |
| ECE 4200 | Electric Filter Design | ECE 3540 | 4 |
| ECE 4280 | Engineering Electromagnetics | ECE 3590 | 4 |
| ECE 4360 | High Voltage Engineering | ECE 3580, ECE 3720 | 4 |
| ECE 4420 | Digital Control | ECE 4830, ECE 4150 | 4 |
| ECE 4520 | Simulation and Modelling | STAT 2220, COMP 2140 | 4 |
| ECE 4860 | (T02) Biomedical Signal Processing | Permission of the Instructor (S. Sherif) | 4 |
| ECE 4860 | (T06) Random Signals and Processes | STAT 2220, ECE 3780 | 4 |

*Note: Courses in italics are either new topics course offerings, or indicate a change in course number.*

# Natural Science Electives – Electrical Engineering 2019–2020

Electrical Engineering students are required to complete one Natural Science Elective as part of their program. This course may be taken anytime during the student's program.

## Approved Natural Science Electives

**FALL TERM 2019**

| Course | | Prerequisites | Cr. Hrs. |
|---|---|---|---|
| ASTR 1810 | Introduction to Astronomy: The Magnificent Universe | | 3 |
| BIOL 1020 | Biology 1: Principles and Themes | | 3 |
| BIOL 1300 | Economic Plants | | 3 |
| BIOL 1410 | Anatomy of the Human Body | | 3 |
| CHEM 1310 | University 1 Chemistry: An Introduction to Physical Chemistry | CHEM 1300 | 3 |
| ENTM 2050 | Introduction to Entomology | | 3 |
| GEOL 1340 | The Dynamic Earth | | 3 |
| MBIO 1220 | Essentials of Microbiology | | 3 |
| PHYS 2260 | Optics | PHYS 1050, MATH 1510, MATH 1210, MATH 1710 | 3 |

**WINTER TERM 2020**

| Course | | Prerequisites | Cr. Hrs. |
|---|---|---|---|
| ASTR 3180 | Stars | Permission of the Physics Department | 3 |
| CHEM 1310 | University 1 Chemistry: An Introduction to Physical Chemistry | CHEM 1300 | 3 |
| CHEM 1320 | University 1 Chemistry: An Introduction to Organic Chemistry | CHEM 1300 | 3 |
| GEOL 1340 | The Dynamic Earth | | 3 |
| MBIO 1220 | Essentials of Microbiology | | 3 |
| PHYS 2386 | Introduction to Quantum Mechanics and Special Relativity | PHYS 2152, MATH 1710 | 3 |
| PHYS 2650 | Classical Mechanics 1 | PHYS 2152, MATH 3132 | 3 |
| PHYS 3220 | Medical Physics and Physiological Measurements | ECE 3580 | 3 |

*Note: Term information is preliminary and is subject to change prior to the time of registration. Students should consult Aurora for the most up-to-date schedule information.*