

#### Electrical Engineering – Telecommunications (Old course sequences)

#### Electrical Engineering program old course sequences for year 2, year 3 and year 4 students

- 1. Students in the 2<sup>nd</sup> year, 3<sup>rd</sup> year and 4<sup>th</sup> year of 120-credit Electrical Engineering program should follow the old sequences presented in the next pages.
- 2. The 1<sup>st</sup> year courses indicated in the following course sequences were offered in academic year 2018-19 and will not be offered anymore.
- 3. The 2<sup>nd</sup> year courses indicated in the following course sequences will be offered only in academic year 2019-20 for the last time.
- 4. The 3<sup>rd</sup> year courses indicated in the following course sequences will be offered only in academic years 2019-20 and 2020-21.
- 5. The 4<sup>th</sup> year courses indicated in the following course sequences will be offered only in academic years 2019-20, 2020-2021 and 2021-22.





# **Electrical Engineering - Telecommunications September Entry (Admitted in Fall 2018 or earlier)**

| Digital Systems Design I Programming Methodology I Basic Circuit Analysis Professional Practice and Responsibility Applied Ordinary Differential Equations  Programming Methodology II | 3.50<br>3.00<br>3.50<br>1.50   | MATH 204<br>MATH 204   |  |
|--|--|--|--|
| Professional Practice and Responsibility  Applied Ordinary Differential Equations  | 3.50<br>1.50   | MATH 204   |  |
| Professional Practice and Responsibility  Applied Ordinary Differential Equations  | 1.50   |  |  |
| Applied Ordinary Differential Equations  |  | PHYS 205   | ENGR 213   |
|  |  |  |  |
| Programming Methodology II   | 3.00   | MATH 205   | MATH 204   |
| Programming Methodology II   |  |  |  |
| 1 10 granning methodology ii   | 3.00   | COEN 243   |  |
| Continuous-Time Signals and Systems  | 3.00   | ELEC 273; ENGR 213   |  |
| Electronics  | 3.50   | ELEC 273   |  |
| Technical Writing and Communication  | 3.00   | Students must pass the Engineering Writing Test (EWT), or pass ENCS 272 with a grade of C- or higher   |  |
| Applied Advanced Calculus  | 3.00   | MATH 204, 205  |  |
|  |  |  |  |
| Introduction to Discrete Mathematics   | 3.00   | MATH 204   |  |
| Computer Organization and Software   | 3.50   | COEN 212, 243  |  |
| Fundamentals of Applied Electromagnetics   | 3.00   | ELEC 273 or ENGR 273   | ENGR 233   |
| Discrete-Time Signals and Systems  | 3.50   | ELEC 242 or 264  |  |
| Introductory Engineering Team Design Project   | 3.00   | ENCS 282; ENGR 213, 233  |  |
|  |  |  |  |
| Introduction to Semiconductor Materials and Devices  | 3.50   | CHEM 205; ENGR 213   |  |
| Fundamentals of Electrical Power Engineering   | 3.50   | ELEC 251, 273  |  |
| Complex Variables and Partial Differential Equations   | 3.00   | ENGR 213, 233  |  |
| Sustainable Development and Environmental Stewardship  | 1.50   |  |  |
| Probability and Statistics in Engineering  | 3.00   | ENGR 213, 233  |  |
|  |  |  |  |
| Electronics II   | 3.50   | ELEC 311; ELEC 242 or 364  |  |
| Electromagnetic Waves and Guiding Structures   | 3.00   | ELEC 251, 365  |  |
| Introduction to Digital Communications   | 3.50   | ELEC 342 or 364; ENGR 371  |  |
| Fundamentals of Control Systems  | 3.50   | ELEC 242 or 364  |  |
| Engineering Management Principles and Economics  | 3.00   |  |  |
| Electrical Engineering Product Design Project  | 3.00   | Minimum of 45 credits in BEng (Electrical); COEN 244; ELEC 311; ENGR 290, 301  |  |
| Numerical Methods in Engineering   | 3.00   | ENGR 213, 233; COMP 248 or COEN 243 or MECH 215 or BCEE 231  |  |
| Impact of Technology on Society  | 3.00   | ENCS 282; ENGR 201, 202  |  |
| Elective*  |  |  |  |
|  |  |  |  |
| Wireless communications  | 3.00   | ELEC 367   |  |
| Telecommunication Networks   | 3.50   | ELEC 244; ELEC 342 or 364; ENGR 371  |  |
| Capstone Electrical Engineering Design Project   | 4.00   | Minimum of 75 credits in BEng (Electrical) or permission of the Department; ENGR 371; COEN 311; ELEC342 or 364; ELEC 390   |  |
| Elective*  |  |  |  |
| Capstone Electrical Engineering Design Project   |  | Minimum of 75 credits in BEng (Electrical) or permission of the Department; ENGR 371; COEN 311; ELEC342 or 364; ELEC 390   |  |
| General Education elective   | 3.00   |  |  |
| Elective*  |  |  |  |
|  | Wireless communications Telecommunication Networks Capstone Electrical Engineering Design Project Elective*  Capstone Electrical Engineering Design Project General Education elective | Wireless communications  Telecommunication Networks  3.50  Capstone Electrical Engineering Design Project  Elective*  Capstone Electrical Engineering Design Project  General Education elective  3.00 | Wireless communications  3.00 ELEC 367  Telecommunication Networks  3.50 ELEC 244; ELEC 342 or 364; ENGR 371  Capstone Electrical Engineering Design Project  4.00 Minimum of 75 credits in BEng (Electrical) or permission of the Department; ENGR 371; COEN 311; ELEC342 or 364; ELEC 390  Elective*  Minimum of 75 credits in BEng (Electrical) or permission of the Department; ENGR 371; COEN 311; ELEC342 or 364; ELEC 390  General Education elective  3.00 |

At least 9 of these 20.5 credits must be taken from the Telecommunications Option Electives list. The rest may be chosen from the Electrical Engineering Electives list. For more information, please consult section 71.30.1 of the 2017-2018 Undergraduate Calendar.





### **Electrical Engineering - Telecommunications January Entry (Admitted in Winter 2019 or earlier)**

| Term   | Course                           | Title   | Credit   | Prerequisite  | Co-requisite |
|--------|----------------------------------|---|--|---|--------------|
| Winter | COEN 212                         | Digital Systems Design I  | 3.50   | MATH 204  |              |
|        | COEN 243                         | Programming Methodology I   | 3.00   | MATH 204  |              |
|        | ELEC 273                         | Basic Circuit Analysis  | 3.50   | PHYS 205  | ENGR 213     |
|        | ENGR 201                         | Professional Practice and Responsibility  | 1.50   |   |              |
|        | ENGR 213                         | Applied Ordinary Differential Equations   | 3.00   | MATH 205  | MATH 204     |
|        |                                  |   |  |   |              |
| Summer | COEN 244                         | Programming Methodology II  | 3.00   | COEN 243  |              |
|        | ELEC 242                         | Continuous-Time Signals and Systems   | 3.00   | ELEC 273; ENGR 213  |              |
|        | ELEC 251                         | Fundamentals of Applied Electromagnetics  | 3.00   | ELEC 273 or ENGR 273  | ENGR 233     |
|        | ENGR 202                         | Sustainable Development and Environmental Stewardship   | 1.50   |   |              |
|        | ENGR 233                         | Applied Advanced Calculus   | 3.00   | MATH 204, 205   |              |
|        |                                  |   |  |   |              |
| Fall   | COEN 231                         | Introduction to Discrete Mathematics  | 3.00   | MATH 204  |              |
|        | COEN 311                         | Computer Organization and Software  | 3.50   | COEN 212, 243   |              |
|        | ELEC 342                         | Discrete-Time Signals and Systems   | 3.50   | ELEC 242 or 264   |              |
|        | ENCS 282                         | Technical Writing and Communication   | 3.00   | Students must pass the Engineering Writing Test (EWT), or pass ENCS 272 with a grade of C- or higher  |              |
|        | ENGR 371                         | Probability and Statistics in Engineering   | 3.00   | ENGR 213, 233   |              |
|        |                                  |   |  |   |              |
| Winter | COEN 311                         | Computer Organization and Software  | 3.50   | COEN 212, 243   |              |
|        | ELEC 321                         | Introduction to Semiconductor Materials and Devices   | 3.50   | CHEM 205; ENGR 213  |              |
|        | ELEC 331                         | Fundamentals of Electrical Power Engineering  | 3.50   | ELEC 251, 273   |              |
|        | ELEC 365                         | Complex Variables and Partial Differential Equations  | 3.00   | ENGR 213, 233   |              |
|        | ENGR 290                         | Introductory Engineering Team Design Project  | 3.00   | ENCS 282; ENGR 213, 233   |              |
|        |                                  |   |  |   |              |
| Fall   | ELEC 312                         | Electronics II  | 3.50   | ELEC 311; ELEC 242 or 364   |              |
|        | ELEC 351                         | Electromagnetic Waves and Guiding Structures  | 3.00   | ELEC 251, 365   |              |
|        | ELEC 367                         | Introduction to Digital Communications  | 3.50   | ELEC 342 or 364; ENGR 371   |              |
|        | ELEC 372                         | Fundamentals of Control Systems   | 3.50   | ELEC 242 or 364   |              |
|        | ENGR 301                         | ·   | 3.00   |   |              |
|        |                                  |   |  |   |              |
| Winter | ELEC 390                         | Electrical Engineering Product Design Project   | 3.00   | Minimum of 45 credits in BEng (Electrical); COEN 244; ELEC 311; ENGR 290, 301   |              |
|        | ENGR 392                         | Impact of Technology on Society   | 3.00   | ENCS 282; ENGR 201, 202   |              |
|        |                                  | Elective*   |  |   |              |
|        |                                  |   |  |   |              |
| Fall   | ELEC 464                         | Wireless communications   | 3.00   | ELEC 367  |              |
|        | ELEC 463                         | Telecommunication Networks  | 3.50   | ELEC 244; ELEC 342 or 364; ENGR 371   |              |
|        | ELEC 490                         | Capstone Electrical Engineering Design Project  | 4.00   | Minimum of 75 credits in BEng (Electrical) or permission of the Department; ENGR 371; COEN 311; ELEC342 or 364; ELEC 390  |              |
|        |                                  | Elective*   |  |   |              |
|        |                                  |   |  |   |              |
| Winter | ELEC 490                         | Capstone Electrical Engineering Design Project  |  | Minimum of 75 credits in BEng (Electrical) or permission of the Department; ENGR 371; COEN 311; ELEC342 or 364; ELEC 390  |              |
|        | ENGR 391                         | Numerical Methods in Engineering  | 3.00   | ENGR 213, 233; COMP 248 or COEN 243 or MECH 215 or BCEE 231   |              |
|        |                                  |   |  |   |              |
|        |                                  | General Education elective  | 3.00   |   |              |
|        | Summer  Fall  Winter  Fall  Fall | ELEC 273 ELEC 273 ENGR 201 ENGR 201 ENGR 213  Summer COEN 244 ELEC 242 ELEC 251 ENGR 202 ENGR 233  Fall COEN 231 COEN 311 ELEC 342 ENCS 282 ENGR 371  Winter COEN 311 ELEC 321 ELEC 321 ELEC 331 ELEC 365 ENGR 290  Fall ELEC 312 ELEC 351 ELEC 367 ELEC 372 ENGR 301  Winter ELEC 390 ENGR 392  Fall ELEC 464 ELEC 463 ELEC 463 ELEC 490 | COEN 243 ELEC 273 Basic Gucuit Analysis ENGR 201 Professional Practice and Responsibility ENGR 213 Applied Ordinary Differential Equations  Summer COEN 244 Programming Methodology II ELEC 242 Continuous-Time Signals and Systems ELEC 251 Fundamentals of Applied Electromagnetics Sustainable Development and Environmental Stewardship ENGR 233 Applied Advanced Calculus  Fall COEN 231 Introduction to Discrete Mathematics COEN 311 Computer Organization and Software ELEC 342 ENCS 282 Technical Writing and Communication ENGR 371 Probability and Statistics in Engineering  Winter COEN 311 Computer Organization and Software ELEC 321 Introduction to Semiconductor Materials and Devices ELEC 331 Fundamentals of Electrical Power Engineering ELEC 365 Complex Variables and Partial Differential Equations ENGR 290 Introductory Engineering Team Design Project  Fall ELEC 351 ELEC 351 Electromagnetic Waves and Guiding Structures Introduction to Digital Communications ELEC 372 ENGR 301 EIEC 372 Endamentals of Control Systems ENGR 301 Engineering Management Principles and Economics  Winter ELEC 390 Electrical Engineering Product Design Project  ENGR 392 Impact of Technology on Society Elective*  Fall ELEC 464 Wireless communications ELEC 465 ELEC 460 Capstone Electrical Engineering Design Project Elective* | COEN 243 Programming Methodology I  ELEC 273 Bast Ciscuit Analysis 3.50  ENGR 201 Professional Practice and Responsibility 1.50  ENGR 213 Applied Ordinary Differential Equations 3.00  Summer COEN 244 Programming Methodology II 3.00  ELEC 242 Continuous Time Signals and Systems 3.00  ELEC 251 Fundamentals of Applied Electromagnetics 3.00  ENGR 203 Applied Advanced Calculus 3.00  ENGR 203 Applied Advanced Calculus 3.00  Fall COEN 231 Introduction to Discrete Mathematics 3.00  COEN 311 Computer Organization and Software 3.50  ELEC 342 Discrete-Time Signals and Systems 3.50  ENGR 371 Probability and Communication 3.00  ENGR 371 Probability and Statistics in Engineering 3.00  Winter COEN 311 Computer Organization and Software 3.50  ELEC 321 Introduction to Semiconductor Materials and Devices 3.50  ELEC 321 Introduction to Semiconductor Materials and Devices 3.50  ELEC 331 Fundamentals of Electrical Power Engineering 3.50  ELEC 331 Fundamentals of Electrical Power Engineering 3.50  ENGR 290 Introductory Engineering Team Design Project 3.00  Fall ELEC 312 Electronics II Electronics II Electromagnetic Waves and Guiding Structures 3.50  ELEC 367 Introduction to Digital Communications 3.50  ELEC 372 Fundamentals of Control Systems 3.50  ELEC 373 Electrical Engineering Product Design Project 3.00  Winter ELEC 384 Electrical Engineering Product Design Project 3.00  ENGR 392 Impact of Technology on Society 3.00  ELEC 464 Wireless communication Networks 3.50  ELEC 490 Capstone Electrical Engineering Design Project 4.00 | CORN-941     |

<sup>\*</sup> At least 9 of these 20.5 credits must be taken from the Telecommunications Option Electives list. The rest may be chosen from the Electrical Engineering Electives list. For more information, please consult section 71.30.1 of the 2017-2018 Undergraduate Calendar.





# **Electrical Engineering - Telecommunications Co-op Entry (Admitted in Fall 2018 or earlier)**

| Year   | Term     | Course      | Title   | Credit | Prerequisite   | Co-requisite |
|--------|----------|-------------|---|--------|--|--------------|
| Year 1 | Fall     | COEN 212    | Digital Systems Design I                              | 3.50   | MATH 204   |              |
|        |          | COEN 243    | Programming Methodology I                             | 3.00   | MATH 204   |              |
|        |          | ELEC 273    | Basic Circuit Analysis                                | 3.50   | PHYS 205   | ENGR 213     |
|        |          | ENGR 201    | Professional Practice and Responsibility              | 1.50   |  |              |
|        |          | ENGR 213    | Applied Ordinary Differential Equations               | 3.00   | MATH 205   | MATH 204     |
|        |          |             |   |        |  |              |
|        | Winter   | COEN 244    | Programming Methodology II                            | 3.00   | COEN 243   |              |
|        |          | COEN 311    | Computer Organization and Software                    | 3.50   | COEN 212, 243  |              |
|        |          | ELEC 242    | Continuous-Time Signals and Systems                   | 3.00   | FLEC 273; ENGR 213   |              |
|        |          | ELEC 311    | Electronics I   | 4      | FLEC 273   |              |
|        |          | ENGR 233    | Applied Advanced Calculus                             | 3.00   | MATH 204, 205  |              |
|        |          |             |   |        |  |              |
|        | Summer   | ELEC 251    | Fundamentals of Applied Electromagnetics              | 3.00   | ELEC 273 or ENGR 273   | ENGR 233     |
|        |          | ELEC 342    | Discrete-Time Signals and Systems                     | 3.50   | ELEC 242 or 264  |              |
|        |          | ENCS 282    | Technical Writing and Communication                   | 3.00   | Students must pass the Engineering Writing Test (EWT), or pass ENCS 272 with a grade of C- or higher                     |              |
|        |          | ENGR 202    | Sustainable Development and Environmental Stewardship | 1.50   |  |              |
|        |          | ENGR 371    | Probability and Statistics in Engineering             | 3.00   | ENGR 213, 233  |              |
| Year 2 | Fall     | Work Term 1 |   |        |  |              |
| rear Z | Ган      | Work remit  |   |        |  |              |
|        | Winter   | COEN 231    | Introduction to Discrete Mathematics                  | 3.00   | MATH 204   |              |
|        | VVIIICCI | ELEC 321    | Introduction to Semiconductor Materials and Devices   | 3.50   | CHEM 205; ENGR 213   |              |
|        |          | ELEC 331    | Fundamentals of Electrical Power Engineering          | 3.50   | ELEC 251, 273  |              |
|        |          | ELEC 365    | Complex Variables and Partial Differential Equations  | 3.00   | ENGR 213, 233  |              |
|        |          | ENGR 290    | Introductory Engineering Team Design Project          | 3.00   | ENCS 282; ENGR 213, 233  |              |
|        |          | ENGR 250    | introductory Engineering ream Design Project          |        | ENGS 202, ENGN 213, 233  |              |
|        | Summer   | ENGR 301    | Engineering Management Principles and Economics       | 3.00   |  |              |
|        |          | ENGR 391    | Numerical Methods in Engineering                      | 3.00   | ENGR 213, 233; COMP 248 or COEN 243 or MECH 215 or BCEE 231  |              |
|        |          | ENGR 392    | Impact of Technology on Society                       | 3.00   | ENCS 282; ENGR 201, 202  |              |
|        |          | 2.10.1.002  | General Education elective                            | 3.00   |  |              |
|        |          |             |   |        |  |              |
| Year 3 | Fall     | ELEC 312    | Electronics II  | 3.50   | ELEC 311; ELEC 242 or 364  |              |
|        |          | ELEC 351    | Electromagnetic Waves and Guiding Structures          | 3.00   | ELEC 251, 365  |              |
|        |          | ELEC 367    | Introduction to Digital Communications                | 3.50   | ELEC 342 or 364; ENGR 371  |              |
|        |          | ELEC 372    | Fundamentals of Control Systems                       | 3.50   | ELEC 242 or 364  |              |
|        |          | ELEC 390    | Electrical Engineering Product Design Project         | 3.00   | Minimum of 45 credits in BEng (Electrical); COEN 244; ELEC 311; ENGR 290, 301  |              |
|        | \A/:1    | Mada Tarang |   |        |  |              |
|        | Winter   | Work Term 2 |   |        |  |              |
|        | Summer   | Work Term 3 |   |        |  |              |
|        |          |             |   |        |  |              |
| Year 4 | Fall     | ELEC 464    | Wireless communications                               | 3.00   | ELEC 367   |              |
|        |          | ELEC 463    | Telecommunication Networks                            | 3.50   | ELEC 244; ELEC 342 or 364; ENGR 371  |              |
|        |          | ELEC 490    | Capstone Electrical Engineering Design Project        | 4.00   | Minimum of 75 credits in BEng (Electrical) or permission of the Department; ENGR 371; COEN 311; ELEC342 or 364; ELEC 390 |              |
|        |          |             | Elective*   |        |  |              |
|        |          |             |   |        |  |              |
|        | Winter   | ELEC 490    | Capstone Electrical Engineering Design Project        |        | Minimum of 75 credits in BEng (Electrical) or permission of the Department; ENGR 371; COEN 311; ELEC342 or 364; ELEC 390 |              |
|        |          |             | Elective*   |        |  |              |
|        |          |             |   |        |  |              |

<sup>\*</sup> At least 9 of these 20.5 credits must be taken from the Telecommunications Option Electives list. The rest may be chosen from the Electrical Engineering Electives list. For more information, please consult section 71.30.1 of the 2017-2018 Undergraduate Calendar.

