

| SCHOOL OF ENGINEERING | | | |
|---|---|----------------------------------|--------------------------------|
| Degree: BACHELOR OF SCIENCE Credits: 128 | | CURRICULUM Since: August 2018 | |
| Program: ELECTRICAL ENGINEERING | | | |
| Description: The Electrical Engineering Program offers students an exciting curriculum covering diverse areas including power, electronics, computers, controls, communications, and signal processing. | | | |
| Course Code | Course Title | Credits | Prerequisites |
| General Education Courses | | | |
| SPAN 152 | Fundamentals of Reading and Writing | 3 | Placement Exam |
| SPAN 250 | Writing Techniques | 3 | SPAN 152 |
| ENGL 152 | Fundamentals of Reading and Writing | 3 | Placement Exam |
| ENGL 153 | Advanced Communicative English | 3 | ENGL 152 |
| ENGL 231 | Research and Writing | 3 | ENGL 153 |
| MATH 152 | Pre-Calculus II | 4 | Placement Exam |
| PHSC 215 | Physics for Engineering I (includes Lab) | 4 | MATH 221 |
| CHEM 203 | General Chemistry I | 4 | MATH 151 |
| HUMA 111 | Universal Culture and Civilization I | 3 | |
| SOSC 111 | Individual, Community, Government and Social Responsibility I | 3 | |
| SOSC 112 | Individual, Community, Government and Social Responsibility II | 3 | SOSC 111 |
| FSEN 105 | Introduction to Engineering | 3 | |
| MATH 221 | Calculus I | 4 | MATH 152 |
| MATH 222 | Calculus II | 4 | MATH 221 |
| MATH 223 | Calculus III | 4 | MATH 222 |
| MATH 395 | Differential Equations | 3 | MATH 222 |
| PHSC 216 | Physics for Engineering II (includes Lab) | 4 | PHSC 215 |
| | Free Elective ¹ (see note for Entrepreneurship & Innovation minor) | 3 | Depends on Elective |
| Core Courses | | | |
| ENGI 122 | Introduction to Computer Programming | 3 | MATH 152 |
| ENGI 223 | Intermediate Programming | 3 | ENGI 122 / MATH 221 |
| ELEN 301 | Electrical Networks I | 3 | MATH 221 |
| ELEN 302 | Electrical Networks I Laboratory | 1 | MATH 221 |
| ENGI 398 | Engineering Mathematics | 3 | MATH 222 / ENGI 122 |
| Concentration Courses | | | |
| ELEN 311 | Electrical Networks II | 3 | ELEN 301 & 302/ MATH 395 |
| ELEN 312 | Digital Logic Design I | 3 | ELEN 301 / ENGI 122 |
| ELEN 313 | Digital Logic Design I Laboratory | 1 | ELEN 302 / ENGI 122 |
| ELEN 330 | Electronics I | 3 | ELEN 301 & 302 |
| ELEN 332 | Electronics I Laboratory | 1 | ELEN 302 |
| ELEN 360 | Random Signals and Systems | 3 | MATH 222 / ELEN 301 |
| ELEN 370 | Electromagnetics | 3 | PHSC 216 / MATH 223 |
| ELEN 415 | Signals, Systems, and Control | 3 | ELEN 301 / MATH 395 / ENGI 398 |
| ELEN 417 | Systems Laboratory | 1 | ELEN 415 |
| ELEN 421 | Electromechanical Energy Conversion Laboratory | 1 | ELEN 302 |
| ELEN 422 | Electrical Machines | 3 | ELEN 311 |
| ELEN 431 | Electronics II | 3 | ELEN 330 |
| ELEN 433 | Electronics II Laboratory | 1 | ELEN 332 |

| Course Code | Course Title | Credits | Prerequisites |
|--|---|---------|---|
| Concentration Courses (continued) | | | |
| ELEN 442 | Microprocessors I | 3 | ELEN 312 |
| ELEN 447 | Microprocessors Laboratory | 1 | ELEN 313 |
| ELEN 474 | Communication Systems I | 3 | ELEN 360 / ELEN 415 |
| ELEN 480 | Power System Analysis I | 3 | ELEN 311 |
| ELEN 491 | Electrical Engineering Design Concepts | 3 | ELEN 311, 312 & 330 |
| ELEN 492 | Major Design Experience | 3 | ELEN 422, 431, 433, 442 & 493 / Last semester status |
| Selected Electives (Select a minimum of 9 credits from a single or combination of lists given below.) | | | |
| Departmental Electives (Courses at the 500-level or above count toward the MSEE or MSCpE degrees.) | | | |
| | Any COMP or CPEN course in the B.S. Computer Engineering curriculum | 3 | As required by CpE Program |
| ECEN 400 | Survey of Electrical and Computer Engineering Topics | 3 | Next to last semester status |
| ELEN 430 | Digital Electronics | 3 | ELEN 330 |
| ELEN 434 | Instrumentation | 3 | ELEN 431 / ELEN 433 |
| ELEN 436 | Power Electronics | 3 | ELEN 330 |
| ELEN 441 | Digital Logic Design II | 3 | ELEN 312 / ELEN 330 |
| ELEN 443 | Microprocessors II | 3 | ELEN 442 |
| ELEN 460 | Digital Signal Processing | 3 | ELEN 415 |
| ELEN 472 | Antennas and Transmission Lines | 3 | ELEN 370 |
| ELEN 475 | Communication Systems II | 3 | ELEN 474 |
| ELEN 478 | RF Design | 3 | ELEN 431 / ELEN 474 |
| ELEN 481 | Power System Analysis II | 3 | ELEN 480 |
| ELEN 484 | Power Transmission and Distribution | 3 | ELEN 480 |
| ELEN 488 | Power System Reliability | 3 | ELEN 480 |
| ELEN 497 | Special Topics | 3 | ECE Head's permission |
| ELEN 498 | Undergraduate Research I | 3 | ECE Head's permission |
| ELEN 499 | Undergraduate Research II | 3 | ELEN 498/ECE Head's permission |
| ENGY 103 | Electrical Energy: Basic Concepts | 1 | |
| ENGY 203 | Fundamentals of Electrical Energy Systems | 1 | [ENGY 103] Co-Req. |
| ENGY 303 | Energy and Electrical Power Systems | 1 | [ENGY 203] Co-Req. |
| ELEN 502 | Advanced Linear Systems | 3 | ELEN 415 or instructor consent |
| ELEN 503 | Solid State Electronics | 3 | ELEN 431 or instructor consent |
| ELEN 505 | Probability and Random Processes | 3 | ELEN 360 or instructor consent |
| ELEN 510 | Advanced Power System Analysis | 3 | ELEN 480 or instructor consent |
| ELEN 511 | Power System Dynamics and Control | 3 | ELEN 480 or instructor consent |
| ELEN 520 | Digital Control Systems | 3 | ELEN 415 or instructor consent |
| ELEN 550 | Digital Filters | 3 | ELEN 415 or instructor consent |
| CPEN 502 | Advanced Analysis & Design of Algorithms | 3 | COMP 315 or instructor consent |
| CPEN 503 | Computer and Network Security | 3 | CPEN 481 or instructor consent |
| CPEN 504 | Advanced Computer Architectures | 3 | CPEN 444 or instructor consent |
| CPEN 505 | Database Management Systems | 3 | CPEN 455 or instructor consent |
| CPEN 511 | Distributed Systems | 3 | CPEN 444 & 452, or instructor consent |
| CPEN 520 | Numerical Optimization | 3 | COMP 411 or instructor consent |
| CPEN 550 | Operating Systems Programming | 3 | CPEN 452 or instructor consent |
| CPEN 552 | Computer Graphics | 3 | ENGI 223 or instructor consent |
| CPEN 640 | Embedded Systems | 3 | ELEN 442 or instructor consent |
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| Course Code | Course Title | Credits | Prerequisites |
|--|---|---------|-----------------------------------|
| Non-Departmental and Non-Engineering Electives | | | |
| ENGI 210 | Engineering Economy | 3 | [MATH 221] Co-Req. |
| ENTR 360 | Entrepreneurship | 3 | Dean's permission |
| ENTR 401 | Identification and Evaluation of Entrepreneurial Opportunities | 3 | Dean's permission |
| IMEN 341 | Accounting and Finance for Engineers | 3 | [MATH 221] Co-Req. |
| IMEN 406 | Operations Research | 3 | MATH 350 or IME Head's permission |
| TCOM 503 | Introduction to TCP/IP | 3 | |
| TCOM 513 | IT Project Management | 3 | |
| TCOM 521 | Introduction to Networking | 3 | |
| Cybersecurity Option (Select a minimum of 9 credits from this list if pursuing this option; select all courses to earn a Certificate in Cybersecurity.) | | | |
| CYBR 501 | Network Security I | 3 | Fourth Year Status |
| CYBR 502 | Computer Security I | 3 | Fourth Year Status |
| CYBR 521 | Network Security II | 3 | CYBR 501 |
| CYBR 522 | Computer Security II | 3 | CYBR 502 |
| CYBR 600 | Cyber Forensics | 3 | CYBR 502 |
| Quality Assurance and Experimental Design Option (Select a minimum of 9 credits from this list if pursuing this option; select all courses to earn a minor.) | | | |
| IMEN 205* | Principles of Engineering Management | 3 | MATH 152 |
| IMEN 395 | Inferential Statistics for Engineers | 3 | IMEN 390 or ELEN 360 |
| IMEN 402 | Work Measurement | 3 | IMEN 390 or ELEN 360 |
| IMEN 405 | Statistical Quality Control | 3 | IMEN 390 / [IMEN 395] Co-Req. |
| IMEN 416 | Design of Industrial Experiments | 3 | IMEN 395 |
| * Accepted only if upgrading to a minor. | | | |
| Engineering Management Option (Select a minimum of 9 credits from this list if pursuing this option. These courses count toward the M.S. degree in Engineering Management.) | | | |
| IMEN 510 | Engineering Management | 3 | Fourth Year Status |
| IMEN 551* | Advanced Engineering Project Management* | 3 | Fourth Year Status |
| IMEN 610 | Statistics for Decision Modeling | 3 | Fourth Year Status |
| IMEN 620 | Advanced Enterprise Continuous Improvement | 3 | Fourth Year Status |
| IMEN 630 | Supply Chain Management for Engineers | 3 | Fourth Year Status |
| IMEN 635 | Logistics Methods and Strategies | 3 | Fourth Year Status |
| IMEN 640 | Design and Operation of Logistics Networks | 3 | IMEN 635 |
| IMEN 645 | Analytics for Decision Making | 3 | IMEN 610 |
| * TCOM 513 Information Technology Project Management may be used as a substitute for IMEN 551. | | | |
| Entrepreneurship and Innovation Minor (Including ELEN 494, select from the list below until a minimum of 12 credits is completed.)¹ | | | |
| INNO 300 | Sustainable Innovation (or ENTR 360) | 3 | Third Year Status |
| INNO 303 | Product Development, Prototyping, and Idea Validation (or ENTR 401) | 3 | INNO 300 |
| INNO 400 | Startup Internship | 3 | School's permission |
| MANA 204 | Mercantile Law and Corporate Ethics (or IMEN 341) | 3 | |
| ¹ Students pursuing the minor in Entrepreneurship and Innovation must take at least one course of the minor sequence outside the School of Engineering as a free elective course. | | | |

Minimum grade required: All courses in the program must be passed with a minimum grade of C.

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| SCHOOL OF ENGINEERING | | | |
|--------------------------------------|---|--------------------|--------------------------------|
| Degree: BACHELOR OF SCIENCE | | PLAN OF STUDY | |
| Credits: 128 | | Since: August 2018 | |
| Program: ELECTRICAL ENGINEERING | | | |
| Course Code | Course Title | Credits | Prerequisites |
| FIRST YEAR - FIRST SEMESTER | | | |
| FSEN 105 | Introduction to Engineering | 3 | |
| MATH 152 | Pre-Calculus II | 4 | Placement Exam |
| SOSC 111 | Individual, Community, Government and Social Responsibility I | 3 | |
| ENGL 152 | Fundamentals of Reading and Writing | 3 | Placement Exam |
| SPAN 152 | Fundamentals of Reading and Writing | 3 | Placement Exam |
| | | 16 | |
| FIRST YEAR - SECOND SEMESTER | | | |
| ENGI 122 | Introduction to Computer Programming | 3 | MATH 152 |
| MATH 221 | Calculus I | 4 | MATH 152 |
| CHEM 203 | General Chemistry I | 4 | MATH 151 |
| ENGL 153 | Advanced Communicative English | 3 | ENGL 152 |
| SPAN 250 | Writing Techniques | 3 | SPAN 152 |
| | | 17 | |
| SECOND YEAR – FIRST SEMESTER | | | |
| ENGI 223 | Intermediate Programming | 3 | ENGI 122 / MATH 221 |
| MATH 222 | Calculus II | 4 | MATH 221 |
| PHSC 215 | Physics for Engineering I | 4 | MATH 221 |
| ENGL 231 | Research and Writing | 3 | ENGL 153 |
| HUMA 111 | Universal Culture and Civilization I | 3 | |
| | | 17 | |
| SECOND YEAR - SECOND SEMESTER | | | |
| ELEN 301 | Electrical Networks I | 3 | MATH 221 |
| ELEN 302 | Electrical Networks I Laboratory | 1 | MATH 221 |
| MATH 223 | Calculus III | 4 | MATH 222 |
| MATH 395 | Differential Equations | 3 | MATH 222 |
| PHSC 216 | Physics for Engineering II | 4 | PHSC 215 |
| | | 15 | |
| THIRD YEAR - FIRST SEMESTER | | | |
| ELEN 311 | Electrical Networks II | 3 | ELEN 301 / ELEN 302 / MATH 395 |
| ELEN 330 | Electronics I | 3 | ELEN 301 / ELEN 302 |
| ELEN 332 | Electronics I Laboratory | 1 | ELEN 302 |
| ELEN 360 | Random signals and Systems | 3 | MATH 222 / ELEN 301 |
| ELEN 370 | Electromagnetics | 3 | PHSC 216 / MATH 223 |
| ELEN 421 | Electromechanical Energy Conversion Laboratory | 1 | ELEN 302 |
| ENGI 398 | Engineering Mathematics | 3 | MATH 222 / ENGI 122 |
| | | 17 | |

| THIRD YEAR - SECOND SEMESTER | | | |
|--------------------------------------|--|----------------|---|
| Course Code | Course Title | Credits | Prerequisites |
| ELEN 312 | Digital Logic Design I | 3 | ELEN 301 / ENGI 122 |
| ELEN 313 | Digital Logic Design I Laboratory | 1 | ELEN 302 / ENGI 122 |
| ELEN 415 | Signals, Systems, and Control | 3 | ELEN 301 / MATH 395 / ENGI 398 |
| ELEN 422 | Electrical Machines | 3 | ELEN 311 |
| ELEN 431 | Electronics II | 3 | ELEN 330 |
| ELEN 433 | Electronics II Laboratory | 1 | ELEN 332 |
| | Selected Elective I | 3 | Depends on Elective |
| | | 17 | |
| FOURTH YEAR - FIRST SEMESTER | | | |
| ELEN 417 | Systems Laboratory | 1 | ELEN 415 |
| ELEN 442 | Microprocessors I | 3 | ELEN 312 |
| ELEN 491 | Electrical Engineering Design Concepts | 3 | ELEN 311, 312 & 330 |
| SOSC 112 | Individual, Community, Government and Social Responsibility II | 3 | SOSC 111 |
| | Selected Elective II | 3 | Depends on Elective |
| | Free Elective | 3 | Depends on Elective |
| | | 16 | |
| FOURTH YEAR - SECOND SEMESTER | | | |
| ELEN 447 | Microprocessors Laboratory | 1 | ELEN 313 |
| ELEN 474 | Communication Systems I | 3 | ELEN 360 / ELEN 415 |
| ELEN 480 | Power System Analysis I | 3 | ELEN 311 |
| ELEN 492 | Major Design Experience | 3 | ELEN 422, 431, 433, 442 & 493 / Last semester status |
| | Selected Elective III | 3 | Depends on Elective |
| | | 13 | |

Minimum grade required: All courses in the program must be passed with a minimum grade of C.

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