Computer Engineering
Archived Curriculum Fall 2019 - Summer 2021

Accredited by the Engineering Accreditation Commission of ABET, www.abet.org

1. University Requirements: (23-24)
- Writing, Rhetoric and American Cultures (WRA) 4
- Integrative Studies in Humanities (IAH) 8
- IAH 201-210 and IAH 211 or >
- Integrative Studies in Social Sciences (ISS) 8
- ISS 2XX and ISS 3XX
- Bioscience (one of the following):
  - BS 161, ENT 205, IBIO 150, MMG 141, MMG 201, PLB 105, PSL 250 3-4

2. College Requirements: (32)
- *CEM 141 General Chemistry 4
- *CSE 231 Introduction to Programming I 4
- *EGR 100 Introduction to Engineering Design 2
- *MTH 132 Calculus I 3
- *MTH 133 Calculus II 4
- MTH 234 Multivariable Calculus 4
- MTH 235 Differential Equations 3
- *PHY 183 Physics for Scientists & Engineers I 4
- PHY 184 Physics for Scientists & Engineers II 4

*College Admission Requirement

3. Major Requirements: (65)

a. Complete one of the following courses: (1)
- CEM 161 Chemistry Laboratory I 1
- PHY 191 Physics Laboratory for Scientists I 1

b. All of the following courses: (39)
- CSE 232 Introduction to Programming II 4
- CSE 260 Discrete Structures in Computer Sci 4
- CSE 331 Algorithms and Data Structures 3
- CSE 325 Computer Systems 3
- ECE 201 Circuits and Systems I 3
- ECE 202 Circuits and Systems II 3
- ECE 203 Electronic Circuits and Systems Lab 1
- ECE 230 Digital Logic Fundamentals 3
- ECE 280 Electrical Engineering Analysis 3
- ECE 302 Electronic Circuits 3
- ECE 303 Electromagnetics Laboratory 1
- ECE 331 Microprocessors & Digital Systems 4
- ECE 366 Introduction to Signal Processing 3
- ECE 390 Ethics, Professionalism and Contemporary Issues 1

c. One of the following courses: (4)
- ECE 480 Senior Design (W) 4
- ECE 489 Independent Senior Design 4

d. Electives: (21)
- Complete 21 credits of electives as specified below.
- Take at least 15 credits from the Focus Tracks below including at least 6 credits from the Core track and at least one course with a lab (L). Additional credits to meet the 21 credit requirement may be taken from Focus Track courses, any 400-level Computer Science and Engineering (CSE) or Electrical and Computer Engineering (ECE) courses, or by completing an approved 3 or 4 credit experiential, out-of-classroom education experience obtained through engineering cooperative education or independent study.

Focus Tracks
a. Core

At least 6 credits from the following:
- CSE 335 Object-Oriented Software Design 4
- CSE 420 Computer Architecture 3
- ECE 430 Embedded Cyber Physical Sys (L) 4
- CSE 422 Computer Networks 3
- ECE 442 Intro to Communication Networks 3
- CSE 425 Intro to Computer Security 3
- ECE 456 Intro to Comm & Network Security 3

Both CSE 422 and ECE 442 may not be used to fulfill this requirement.
Both CSE 425 and ECE 456 may not be used to fulfill this requirement.

b. Hardware

- ECE 402 App of Analog Integ Circuits (L) 4
- ECE 410 VSL Design (L) 4
- ECE 411 Electronic Design Automation (L) 4
- ECE 431 Smart Sensor Systems (L) 3
- ECE 445 Biomedical Instrumentation 3

c. Software Systems

- CSE 410 Operating Systems 3
- CSE 415 Parallel Programming 3
- CSE 435 Software Engineering 3
- CSE 450 Translation of Prog Languages 3
- CSE 476 Mobile Applications Development 3

d. Intelligent Systems

- ECE 446 Biomedical Signal Processing 3
- ECE 466 Digital Signal Processing 3
- CSE 440 Introduction to Artificial Intelligence 3

e. Electrical Systems

- ECE 305 Electromagnetic Fields & Waves I 4
- ECE 313 Control Systems 3
- ECE 377 Principles of Electronic Devices 3
- ECE 404 Radio Frequency ELEC Circuits (L) 4
- ECE 417 Robotics (L) 4

Other Electives (Variable)

Total credits Required for Degree 128

Last revised April 2020
NOTES:

Biomedical Engineering Concentration: (15)
The department offers a concentration for students who plan to pursue graduate work in biomedical areas or seek employment in selected medical-related areas. The concentration is available to, but not required of, any student enrolled in the Bachelor of Science degree program in Computer Engineering. Courses completed to satisfy requirement 3. above may also be used to satisfy the requirements of the concentration. NOTE: Completing the Bachelor of Science degree in Computer Engineering with a concentration may require more than 128 credits. Upon completion of the required courses a concentration, certification will appear on the student’s official transcript.

To earn a Bachelor of Science degree in Computer Engineering with a biomedical engineering concentration, students must complete requirements 1., 2., and 3. above and the following:

1. Complete 6 credits from the following courses:
   - ANTR 350 Human Gross Anatomy for Pre-Health Professionals 3
   - BS 161 Cell and Molecular Biology 3
   - PSL 250 Introductory Physiology 4
   - PSL 310 Physiology for Pre-Health Professionals 4

2. Complete 9 credits from the following or one 3 or 4 credit ECE 490 or ECE 491 course with biomedical engineering content as approved by the student’s advisor.
   - BE 444 Biosensors for Medical Diagnostics 3
   - ECE 445 Biomedical Instrumentation 3
   - ECE 446 Biomedical Signal Processing 3
   - ECE 447 Introduction to Biomedical Imaging 3
   - ECE 448 Modeling and Analysis of Bioelectrical Systems 3
   - ECE 449 Fundamentals of Acoustics 3

The requirements listed apply to students admitted to the major of Computer Engineering beginning Fall, 2019. The Department of Electrical and Computer Engineering (ECE) constantly reviews program requirements and reserves the right to make changes as necessary. Students are encouraged to consult with their advisor to obtain assistance in planning an appropriate schedule. Students who have questions about Computer Engineering should contact the Electrical and Computer Engineering Department Advising Office, 2212 Engineering Building, phone (517) 355-5242.
Computer Engineering

Sample Program

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<th>Fall</th>
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<th>Spring</th>
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<td>CSE 231</td>
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<td>CEM 141</td>
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<td>MTH 133</td>
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<td>EGR 100</td>
<td>2</td>
<td>PHY 183</td>
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<td>3</td>
<td>ISS 2XX</td>
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<td>4</td>
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Program Educational Objectives

The bachelor's degree in electrical/computer engineering provides its graduates with a solid foundation on which they can build successful and sustainable careers in the ever-changing global work environment. The program prepares its graduates for a variety of career paths including engineering positions directly after program completion, entry to engineering graduate school, and entry to other professional graduate-level schools, and eventual leadership in technical, organizational, and entrepreneurial arenas.

Specifically, the electrical/computer engineering program prepares its graduates to become successful in:

- maintaining and increasing their technical and/or broad expertise through lifelong learning;
- using/applying their continual improving expertise in the practice of electrical/computer engineering or a related career; and
- sharing their expertise to the benefit of the larger community.

Last revised April 2011