Computer Engineering

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
   Integrative Studies in Social Sciences (ISS)     8
   Bioscience (one of the following):
      BS 161, ENT 205, IBIO 150, MMG 141,       3-4
      MMG 201, PLB 105, PSL 250

2. College Requirements: (28)
   CEM 141  General Chemistry                        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

3. Major Requirements: (69)

   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: (44)
      CSE 231  Introduction to Programming I            4
      CSE 232  Introduction to Programming II           4
      CSE 260  Discrete Structures in Computer Sci      4
      CSE 331  Algorithms and Data Structures           3
      CSE 410  Operating 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  Electronics Laboratory                    1
      ECE 331  Microprocessors & Digital Systems        4
      ECE 390  Ethics, Professions and Cont. Issues     1
      ECE 480  Senior Design (W)                         4

C. Major Electives: (24)
   Complete 24 credits of electives as specified below. At least
   18 credits must be from core and focus track electives
   combined, with at least one course with a laboratory.
   Additional credits to meet the 24 credit requirement may be
   taken from other courses listed below, 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.

   Core Electives: (6)
      At least 6 credits from the following:
      CSE 420  Computer Architecture                       3
      ECE 410  VLSI Design (L)                            4
      CSE 422*  Computer Networks                          3
      or
      ECE 442*  Introduction to Communication Networks     3
      *CSE 422 or ECE 442 can count towards your total Core Electives

      Focus Track Electives: (12)
      At least 12 credits from the following:
      Hardware:
         ECE 402  Appl of Analog Integrated Circuits (L)    4
      ECE 411  Electronic Design Automation (L)           4
      ECE 412  Intro to Mixed-Signal Circuits Design (L)  4
      ECE 445  Biomedical Instrumentation                 3
      Software:
         CSE 335  Object-oriented Software Design           4
      CSE 450  Translation of Programming Languages       3
      CSE 471  Media Processing & Multimedia              3
      Computing:
         ECE 366  Introduction to Signal Processing         3
      Recommended Electives:
         ECE 305  Electromagnetic Fields & Waves I          4
         ECE 313  Control Systems                           3
         ECE 404  Radio Frequency Electronic Circuits       4
         ECE 415  Computer Aided Manufacturing              3
         ECE 416  Digital Control                            3
         ECE 457  Communication Systems                     3
         ECE 458  Communication Systems Laboratory          1
         ECE 466  Digital Signal Processing & Filter Design 3
         ECE 474  Principles of Electronics Devices         3

   Other Electives (Variable)

Total Credits Required for Degree 128

The requirements listed above apply to students admitted to the major of Computer Engineering beginning Fall, 2013. 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.
Biomedical Engineering Concentration

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. The concentration will be noted on the student’s transcript.

Biomedical Engineering

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 6 credits from the following courses:**
   - 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

3. **Complete 3 credits from the following courses:**
   - BE 444 Biosensors for Medical Diagnostics 3
   - ME 494 Biofluid Mechanics and Heat Transfer 3
   - ME 495 Tissue Mechanics 3
   - MSE 425 Biomaterials and Biocompatibility 3

A 400-level listed above or other approved Electrical and Computer Engineering (ECE) courses with biomedical engineering content as approved by the student’s advisor. The course used to fulfill this requirement may not be used to fulfill concentration requirement 1. or 2.

Program 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.

Computer Engineering Sample Program

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<th>Spring</th>
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Last Revised: April 2011

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