Electrical Engineering
Accredited by the Engineering Accreditation Commission of ABET,
111 Market Place, Suite 1050, Baltimore, MD 21202-4012 - telephone (410) 347-7700

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 110, BS 111, ENT 205, MMG 201,
     MMG 301, PLB 105, PSL 250, ZOL 141 3-4

2. College Requirements: (30)
   CEM 141 General Chemistry 4
   EGR 100 Introduction to Engineering Design 2
   EGR 102 Introduction to Engineering Modeling 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: (44)
   A. Complete one of the following courses: (1)
      CEM 161 Chemistry Laboratory I 1
      PHY 191 Physics Laboratory for Scientists I 1
   B. Complete all of the following courses: (40)
      CSE 251 Programming in C 1
      ECE 201 Circuits and Systems I 3
      ECE 202 Circuits and Systems II 3
      ECE 203 Circuits and Systems Laboratory 1
      ECE 230 Digital Logic Fundamentals 3
      ECE 280 Electrical Engineering Analysis 3
      ECE 302 Electronic Circuits 3
      ECE 303 Electronics Laboratory 1
      ECE 305 Electromagnetic Fields & Waves I 4
      ECE 313 Control Systems 3
      ECE 320 Energy Conversion & Pwr Electronics 3
      ECE 331 Microprocessors & Digital Systems 4
      ECE 366 Introduction to Signal Processing 3
      ECE 390 Ethics, Profssnlism and Cont. Issues 1
      ECE 480 Senior Design 4
   C. Select one of the following courses: (3)
      CE 221 Statics 3
      ME 201 Thermodynamics 3
   D. Major Electives (18)
      A minimum of six courses totaling a minimum of 18 credits, of 3-
      or 4-credits each, selected from at least four different areas. A
      laboratory course ("L") must be included. Students may
      substitute, for one of the six required courses, a 3- or 4-credit
      experiential education experience obtained in a minimum of
      three out-of-classroom experiences through engineering
      cooperative education or independent study. Students interested
      in the experiential education experience must contact the
      department for approval.
      
      Electromagnetics
      ECE 405 Electromagnetic Fields and Waves II (L) 4
      ECE 407 Electromagnetic Compatibility (L) 4
      
      Power
      ECE 423 Power System Analysis & Lab 3
      
      Integrated Circuits / VLSI
      ECE 402 Applications of Analog Integrated Circuits (L) 4
      ECE 404 Radio Frequency Electronic Circuits 4
      ECE 410 VSI Design (L) 4
      ECE 411 Electronic Design Automation (L) 4
      ECE 412 Mixed-Signal Integrated Circuits (L) 4
      
      Solid-State Electronics / Electro-optics
      ECE 474 Principles of Electronic Devices 3
      ECE 476 Electro-Optics (L) 4
      ECE 477 Microelectronic Fabrication (L) 3
      
      Communications / Signal Processing
      ECE 442 Introduction to Communication Networks 3
      ECE 457 Communication Systems & Lab 3
      ECE 466 Digital Signal Processing and Filter Design 3
      
      Control / Robotics
      ECE 415 Computer Aided Manufacturing (L) 3
      ECE 416 Digital Control (L) 3
      
      Biomedical Engineering
      ECE 445 Biomedical Instrumentation (L) 3
      ECE 446 Biomedical Signal Processing 3
      ECE 447 Biomedical Imaging 3
      ECE 448 Modeling & Analys of Bioelectrical Systems 3
      
      Experiential Education Substitution
      Students may use registered "out of classroom" experiences to
      waive one 400-level requirement outside of the major elective
      requirement. This is a combination of 3 or more experiences
      documented by pre-approved EGR/ECE credits (EGR 393, ECE
      490/499).
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 Electrical 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 Concentration: (15)
To earn a Bachelor of Science degree in Electrical Engineering with a biomedical engineering concentration, students must complete requirements 1., 2., and 3. above and the following. Completion of courses in this concentration may also satisfy Major and Elective course requirements. Check with the academic adviser for guidance.

1. Complete 6 credits from the following: (6)
   ANTR 350  Human Gross Anatomy & Structural Biology  3
   BS 111  Cells and Molecules  3
   PSL 250  Introductory Physiology  4
   PSL 431  Human Physiology I  3
   PSL 432  Human Physiology II  3

2. Complete 6 credits from the following: (6)
   ECE 445  Biomedical Instrumentation  3
   ECE 446  Biomedical Signal Processing  3
   ECE 447  Biomedical Imaging  3
   ECE 448  Modeling & Anlys of Bioelectrical Systems  3

3. Complete at least 3 credits from 1) the list below or 2) any 400-level course listed above but not otherwise counted toward the concentration, or 3) other approved course such as ECE 490 or ECE 491 with biomedical engineering content. (3)
   ME 494  Biofluid Mechanics and Heat Transfer  3
   ME 495  Tissue Mechanics  3
   MSE 425  Biomaterials and Biocompatibility  3

Other Electives (Variable)

Total Credits Required for Degree  128

The requirements listed above apply to students admitted to the major of Electrical Engineering beginning Fall, 2008. 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.

Last revised May 2009
Electrical Engineering
Sample Program

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Program Objectives

The electrical engineering program provides its graduates with a solid foundation on which they can build successful and sustainable careers. Within the first several years following graduation, graduates of the electrical engineering program will:

1. **have accrued an understanding of the discipline**, built on an exposure to a broad range of electrical engineering topics including the latest and emerging techniques and technologies.
2. **have established expertise within the discipline** originating with in-depth study in selected curricular areas emphasizing the solution to engineering problems using proper tools, practical approaches, and creative problem solving.
3. **be engaged in lifelong learning** in electrical engineering, based on a strong foundation in the core sciences and mathematics.
4. **have an appreciation for the global and societal impact of the discipline** through an exposure to contemporary issues, and a knowledge and respect for ethical standards and professional responsibilities.
5. **have successfully utilized essential professional skills** such as teamwork and communications, both oral and written, within the context of engineering problem solving and design.

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