Electrical Engineering

**University Requirements (23-24)**
- Writing – Writing, Rhetoric, & American Thought (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

**College Requirements (30)**
- CEM 141 General Chemistry 4
- CSE 231 Introduction to Programming I 4
- 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

**Major Requirements (42)**
- CEM 161 Chemistry Laboratory I
  OR
- PHY 191 Physics Laboratory for Scientists I 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 Circuits and Systems Laboratory 1
- ECE 320 Energy Conversion and Power Electronics 3
- ECE 331 Microprocessors and Digital Systems 4
- ECE 366 Introduction to Signal Processing 3
- ECE 390 Ethics, Professionalism and Cont. Issues 1
- ECE 480 Senior Design 4
- ME 201 Thermodynamics
  OR
- CE 221 Statics 3

1 If PHY 231 is taken in place of PHY 183, PHY 233B must also be completed. If PHY 232 is taken in place of PHY 184, PHY 234B must also be completed.

The requirements listed above apply to students admitted to the major of Electrical Engineering beginning Fall, 2007. The Department of Electrical & Computer Engineering (ECE) constantly reviews program requirements and reserves the right to make changes as necessary. Students are encouraged to consult with an advisor to obtain assistance in planning an appropriate schedule. Students who have questions about Electrical Engineering should contact the Electrical and Computer Engineering Advising Office, 2212 Engineering Building, phone (517) 355-5242.

**Major Electives (18-24)**
- A minimum of six lecture courses totaling 18 to 24 credits, selected from at least four different areas. A minimum of one laboratory must be completed. (L) indicates a laboratory included in the course.

**Electromagnetics**
- ECE 405 Electromagnetic Fields and Waves II (L) 4
- ECE 407 Electromagnetic Compatibility (L) 4

**Power**
- ECE 423 / 420 Power System Analysis & Lab 3-4
  * Note: Lab Section is optional

**Integrated Circuits/VLSI**
- ECE 402 Applications of Analog Integrated Circuits (L) 4
- ECE 404 Radio Frequency Electronic Circuits (L) 4
- ECE 410 VLSI Design (L) 4
- ECE 411 Electronic Design Automation (L) 4
- ECE 412 Mixed-Signal Integrated Circuits 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 457 / 458 Communication Systems & Lab 3-4
  * Note: Lab Section is optional
- ECE 466 Digital Signal Processing & Filter Design 3

**Control/Robotics**
- ECE 415 Computer Aided Manufacturing (L) 3
- ECE 416 Digital Control (L) 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).

**Other Electives (Variable)**

**Total Credits Required for Degree** 128
### Electrical Engineering Sample Program

#### Freshman Year

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<td>CEM 141</td>
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<td>MTH 132</td>
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Total: 16/18

#### Sophomore Year

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Total: 14/16

#### 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.

The electrical engineering program is accredited by the Accreditation Board for Engineering and Technology (ABET)

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**Last revised May 2007**