# Electrical Engineering

## University Requirements (23-24)
- Writing – American Thought and Language (ATL) 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 205, 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
- 1PHY 183 Physics for Scientists & Engineers I 4
- 2PHY 184 Physics for Scientists & Engineers II 4

## Major Requirements (43-45)
- CEM 161 Chemistry Laboratory I
- OR
  - PHY 191 Physics Laboratory for Scientists I 1
  - ECE 200 Electric Circuits 4
  - ECE 230 Digital Logic Fundamentals 3
  - ECE 302 Electronic Circuits 3
  - ECE 303 Electromagnetic Laboratory 1
  - ECE 305 Electromagnetic Fields & Waves I 3
  - ECE 360 Signals and Linear Systems 4
  - ECE 480 Senior Design 5
  - ME 201 Thermodynamics
- OR
  - ME 221 Statics 3
  - STT 351 Probability and Statistics for Engineering 3

Choose four of the following courses:
- ECE 306 Electromagnetic Fields & Waves II 4
- ECE 313 Control Systems 3
- ECE 320 Energy Conversion & Power Electronics 3
- ECE 331 Microprocessors & Digital Systems 4
- ECE 474 Principles of Electronic Devices 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.

## Major Electives (9)
A minimum of 9 credits must be taken from the list below, including at least one lab (L) course:
- ECE 410 VLSI Design (L) 4
- ECE 411 Electronic Design Automation (L) 4
- ECE 418 Algorithms of Circuit Design 3
- ECE 421 Power System Analyses (L) 4
- ECE 435 Electromagnetic Waves & Applications (L) 4
- ECE 457 Communication Systems 3
- ECE 458 Communication Systems Laboratory 1
- ECE 466 Digital Signal Processing & Filter Design 3
- ECE 476 Electro-Optics (L) 3
- ECE 477 Microelectronic Fabrication (L) 3
- ECE 484 Applications of Analog Integrated Circuits (L) 4
- ECE 485 Digital Control & Robotics (L) 4

## Technical Electives (9)
An approved list of Technical Electives is available from the advisor.

## Other Electives (Variable)

## Total Credits Required for Degree
128

The requirements listed above apply to students admitted to the major of Electrical Engineering in the Department of Electrical and Computer Engineering beginning Spring, 2002. The Department of Electrical and Computer Engineering (ECE) constantly reviews program requirements and reserves the right to make changes as necessary. Consequently, each student is strongly encouraged to consult with his/her advisor to obtain assistance in planning an appropriate schedule of courses. Students who have questions about Electrical Engineering should contact the Electrical and Computer Engineering Department Advising Office, 2212 Engineering Building, phone (517)355-5242.

Some courses may have prerequisites, which are not otherwise required in the program. Students should check course descriptions to ensure they are aware of prerequisites.

_Last revised March, 2002_
Electrical Engineering
Sample Program

Freshman Year

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<thead>
<tr>
<th>Fall Credits</th>
<th>Spring Credits</th>
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<tr>
<td>ATL 1XX or ISS 2XX</td>
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</tr>
<tr>
<td>ISS 2XX</td>
<td>4</td>
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<tr>
<td>CEM 161</td>
<td>1</td>
</tr>
<tr>
<td>Bioscience (AT)</td>
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<tr>
<td>CEM 141</td>
<td>4</td>
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<td>MTH 132</td>
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Sophomore Year

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<td>ECE 200</td>
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<tr>
<td>IAH 20X</td>
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<td>ME 201/221</td>
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Junior Year

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<tr>
<td>Elective</td>
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<td>Technical Elec</td>
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Senior Year

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<tr>
<td>Design Elec/ Lab</td>
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Program Objectives

The undergraduate program in electrical engineering must assure that graduates are adequately prepared to enter and continue to practice in the field of electrical engineering. To achieve this, the program must provide a sufficiently broad base of mathematics, physical science, engineering science, computer experience, laboratory experience, and design experience in order that the students can learn to apply the fundamentals of electrical engineering principles in a reasonable and efficient manner. The structure of the curriculum must provide both breadth and depth across a range of electrical engineering topics. In addition, the program must demonstrate that graduates can apply probability, statistics, differential equations, and additional mathematics to the solution of engineering problems within the purview of electrical-engineering professionals. This educational experience must integrate knowledge and skills acquired in a diverse set of courses to achieve the following for graduates of the program:

(a) an ability to apply knowledge of mathematics, science and engineering;

(b) an ability to design and conduct experiments, as well as to analyze and interpret data;

(c) an ability to design a system, component, or process to meet desired needs;

(d) an ability to function on multi-disciplinary teams;

(e) an ability to identify, formulate, and solve engineering problems;

(f) an understanding of professional and ethical responsibility;

(g) an ability to communicate effectively;

(h) the broad education necessary to understand the impact of engineering solutions in a global/societal context;

(i) a recognition of the need for and the ability to engage in life-long learning;

(j) a knowledge of contemporary issues; and

(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

Last revised March, 2002