# Course Outline

**Course Title:** Intro to Solid State Electronics  
**Submitted By:** Scott Norcia  
**Semester Course Prefix and Number:** ECM 1233  
**Old Quarter Course Prefix and Number:**  
**Approval Date:**  
**Revision Date:** 8/31/16  

<table>
<thead>
<tr>
<th>Number of Credits:</th>
<th>4</th>
<th>Number of Lecture Credits:</th>
<th>1</th>
<th>Number of Lab Credits:</th>
<th>3</th>
<th>Number of Lab Hours:</th>
<th>6</th>
<th>Number of Studio/Demonstration/Internship Credits:</th>
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<tbody>
<tr>
<td><strong>Semester(s) Offered:</strong></td>
<td>Fall</td>
<td><strong>Class Size:</strong></td>
<td>24</td>
<td><strong>Negotiated by AASC on:</strong></td>
<td>(date)</td>
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**Course Purpose Code:**

- 0 – Developmental Courses
- 1 – Non-transferable
- 2 – Technical course related to career programs
- 3 – College course which has the primary goal of applying certain concepts (e.g. vocal ensemble)
- 4 – Other college course not considered a part of MNTC (e.g. computer science, health, physical education)
- 5 – Course which is intended to fulfill the Minnesota Transfer Curriculum (MNTC) requirements or intended for transfer.
- 9 – Continuing Education/Customized Training specialized credit course (not occurring in 0-5)

**Catalog Description:**
The course is a “Hybrid” or "Blended" course with the majority of the learning environment traditional in-class lectures and hands-on lab work which also includes Web-based learning activities to complement face-to-face work. This offering is designed as a foundational course for those entering electrical maintenance/engineering related fields. Basic solid state theory is studied with a focus on semiconductor materials, PN junction devices, discrete and integrated semiconductor applications, schematic symbols, device testing, and the mathematical and practical analysis of circuits from a troubleshooting perspective. Lab safety and the safe and proper use of tools and test equipment are emphasized.

**Prerequisites and/or recommended entry skills/knowledge:**

- **Course Prerequisite(s):** None
- **Reading Prerequisite:** None
- **Composition Prerequisite:** None
- **Mathematics Prerequisite:** None

**Career Programs and Transfer Majors Accessing this Course:**

- Electrical Controls and Maintenance Diploma
- Electrical Controls and Maintenance AAS

**Minnesota Transfer Curriculum Goal(s) partially met by this course if applicable:**

<table>
<thead>
<tr>
<th>Goal(s) Met by Course if Applicable</th>
<th>Notes: No more than two goals may be met by any one course. AASC review and the Chief Academic Officer's approval are required.</th>
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<tbody>
<tr>
<td>0. None</td>
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<tr>
<td>1. Communications</td>
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<td>2. Critical Thinking</td>
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<tr>
<td>3. Natural Sciences</td>
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<td>4. Mathematical/Logical Reasoning</td>
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<td>5. History and the Social and Behavioral Sciences</td>
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<td>6. The Humanities and Fine Arts</td>
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<td>7. Human Diversity</td>
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<td>8. Global Perspectives</td>
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<td>9. Ethical and Civic Responsibility</td>
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<td>10. People and the Environment</td>
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Learning Outcomes: (including any relevant competencies listed in the Minnesota Transfer Curriculum)

Upon completion of this course, the student will be able to:

1.) Explain semiconductor material construction.
2.) Explain depletion layer principles.
3.) Properly bias a PN junction.
4.) Construct and troubleshoot a filtered, regulated full wave bridge rectifier.
5.) Construct and troubleshoot a basic BJT amplifier.
6.) Apply thyristor principles to AC phase control.
7.) Properly use test equipment to measure voltage, current and resistance.
8.) Read a schematic.
9.) Identify basic electronic and electrical components and their schematic symbols.
10.) Observe proper safety procedures.
11.) Work cooperatively.
12.) Apply critical thinking skills.

Student Assessment Methods:

Lab assignments, worksheets, papers, and tests.

Use of Instructional Technology: (includes software, interactive video and other instructional technologies):

Power Point Software, videos, software based lab simulators.

Additional Special Information: (special fees, directives on hazardous materials, etc.)

Laptop Computer Lease and Required Tool List

Transfer Information: (Please list colleges/majors that accept this course in transfer.)

None

Affiliated Mesabi Range CollegeCourses and Programs:

Approvals:

<table>
<thead>
<tr>
<th>Body</th>
<th>Representative Signatures</th>
<th>Date</th>
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<tbody>
<tr>
<td>Faculty Association</td>
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<tr>
<td>Academic Affairs Standards Committee</td>
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<tr>
<td>Chief Academic Officer</td>
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Distribution: Original – Instructional Services
Copies: Transfer Specialist, Originating Faculty Member, Records
Revised: December 2012