

# MESABI RANGE COMMUNITY & TECHNICAL COLLEGE

## Course Outline

Course Title: Intro to Solid State Electronics  
Semester Course Prefix and Number: PAS 1233  
Old Quarter Course Prefix and Number:

Submitted By: Scott Norcia  
Approval Date:  
Revision Date: 11/23/11

Number of Credits: 4  
Semester(s) Offered: Fall  
Class Size: 24

Number of Lecture Credits: 1  
Number of Lab Credits: 3 Number of Lab Hours: 6  
Number of Studio/Demonstration/Internship Credits:

Negotiated by AASC on:  
(date)

### Course Purpose Code:

- 0 – Developmental Courses
- 1 – Non-transferable, General Education
- 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 general education (MNTEC) (e.g. computer science, health, physical education)
- 5 – Course which is intended to fulfill the Minnesota Transfer Curriculum (MNTEC) requirements or intended for transfer.
- 9 – Continuing Education/Customized Training specialized credit course (not occurring in 0-5)

### Catalog Description:

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 is 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:

Process Automation Systems Diploma  
Process Automation Systems AAS

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

(Notes: No more than two goals may be met by any one course. Curriculum Committee review and the Chief Academic Officer's approval are required.)

- |  |  |
|--|--|
| 0. <input checked="" type="checkbox"/> None                                | 6. <input type="checkbox"/> The Humanities and Fine Arts     |
| 1. <input type="checkbox"/> Communications                                 | 7. <input type="checkbox"/> Human Diversity                  |
| 2. <input type="checkbox"/> Critical Thinking                              | 8. <input type="checkbox"/> Global Perspectives              |
| 3. <input type="checkbox"/> Natural Sciences                               | 9. <input type="checkbox"/> Ethical and Civic Responsibility |
| 4. <input type="checkbox"/> Mathematical/Logical Reasoning                 | 10. <input type="checkbox"/> People and the Environment      |
| 5. <input type="checkbox"/> History and the Social and Behavioral Sciences |  |

**Learning Outcomes:** (including any relevant competencies listed in the Minnesota Transfer Curriculum)

Following the completion of this course the student will be able to demonstrate the ability 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.) Explain operational amplifier characteristics.
- 8.) Apply operational amplifiers to basic summing/differentiation circuits.
- 9.) Properly use test equipment to measure voltage, current and resistance.
- 10.) Read a schematic.
- 11.) Identify basic electronic and electrical components and their schematic symbols.
- 12.) Observe proper safety procedures.
- 13.) Work cooperatively.
- 14.) 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.

**Outline or Statement of Major Course Content:**

See "Learning Outcomes" above.

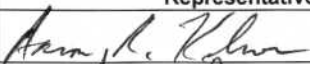
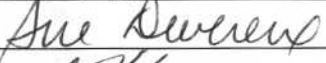
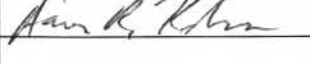
**Additional Special Information:** (special fees, directives on hazardous materials, etc.)

Laptop Computer Lease

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

None

**Approvals:**

Body	Representative Signatures	Date
Curriculum Committee		11-29-11
Faculty Association		12-5-11
Academic Affairs Standards Committee		11-29-11
Chief Academic Officer		

**Distribution:** Original – Administrative Office  
**Copies:** Curriculum Committee Chair, AASC Chair, Transfer Specialist, Originating Faculty Member, Scheduler, Records, Student Services, Learning Center, Library  
**Revised:** October 2006