

MESABI RANGE COMMUNITY & TECHNICAL COLLEGE

Course Outline

Course Title: Intro to Digital Electronics
Semester Course Prefix and Number: PAS 1243
Old Quarter Course Prefix and Number:

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

Number of Credits: 3
Semester(s) Offered: Fall
Class Size: 24

Number of Lecture Credits: 1
Number of Lab Credits: 2 Number of Lab Hours: 4
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 (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:

This offering is designed as a foundational course for those entering electrical maintenance/engineering related fields. Basic digital concepts are studied with a focus on basic logic gates, numbering systems, combinational logic circuits, circuit simplification, integrated logic circuits, 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
Wind Energy Technology 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.)

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|----------------------------------------------------------------------------|--------------------------------------------------------------|
| 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.) Differentiate between digital and analog circuits.
- 2.) Comprehend the numbering systems unique to digital electronics.
- 3.) Describe the functions of the seven basic logic gates.
- 4.) Utilize the seven basic logic gates in combinational logic circuits.
- 5.) Simplify combinational logic circuits using Karnaugh mapping and NAND logic.
- 6.) Comprehend memory circuits.
- 7.) Comprehend logic timing diagrams.
- 8.) Apply basic integrated digital circuits (encoders, decoders, data selectors).
- 9.) Properly use test equipment to measure digital logic levels.
- 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 | <i>Ann R. Kohn</i> | 11-29-11 |
| Faculty Association | <i>Sue Deveraux</i> | 12-5-11 |
| Academic Affairs Standards Committee | <i>Ann R. Kohn</i> | 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