Course Outline

Instructors
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Office Hours
• By appointment

Teaching Assistant
• TBD

Contact Hours
• 4 credit hours
• Lectures
  3 hours × 13 weeks = 39 hours
• Laboratories
  3 hours × 5 weeks = 15 hours

Prerequisites
• ENG 1450 Introduction to Electrical and Computer Engineering
• MATH 2132 Engineering Mathematical Analysis 2

Course Website
https://universityofmanitoba.desire2learn.com/

ECE 3010 – Elements of Electric Machines & Digital Systems
Winter 2015

Course Objectives
The objective of this course is to introduce elementary concepts in AC circuits, electric machines, and digital sub-systems. Topics include electrical impedance, capacitors, inductors, electric motors and generators, logic gates, decoders, multiplexing, flip flops, registers, microprocessor structures, I/O and data acquisition.

Course Content
The following topics will be covered:
• Introduction to digital devices.
• Digital systems: basic computer model; input and output; and microcontroller hardware and software.
• Basics of linear direct current circuits.
• DC machines.
• Basics of linear alternating current circuits.
• AC machines.

Textbook

Textbook
The 68HC11 Microcontroller, by J.D. Greenfield.
Digital Design by Morris Mano.
Electronics: Circuits & Devices by Ralph J. Smith.
(These reference texts will be available through Library Reserve.)

Requirements/Regulations
• Attendance at lectures and laboratories is essential for successful completion of this course. Students must satisfy each evaluation component in the course to receive a final grade.
• It is the responsibility of each student to contact the instructor in a timely manner if he or she is uncertain about his or her standing in the course and about his or her potential for receiving a failing grade. Students should also familiarize themselves with the University's General Academic Regulations, as well as Section 3 of the Faculty of Engineering Academic Regulations dealing with incomplete term work, deferred examinations, attendance and withdrawal.
• No programmable devices or systems (such as calculators, PDAs, iPods, iPads, cell phones, wireless communication or data storage devices) are allowed in examinations unless approved by the course instructor.

Important Dates
• Term Test
  March 10th, 2015, 6:00pm-8:00pm
• Voluntary Withdrawal Deadline
  March 19th, 2015
• Mid-term Break
  February 16–20, 2015
  No classes or examinations
• Good Friday
  April 3rd, 2015
  No classes or examinations
Accreditation Details

Accreditation Units
- Mathematics: 0%
- Natural Science: 0%
- Complementary Studies: 0%
- Engineering Science: 75%
- Engineering Design: 25%

Attributes
A1: A knowledge base for engineering
A2: Problem analysis
A3: Investigation
A4: Design
A5: Use of engineering tools
A6: Individual and team work
A7: Communication skills
A8: Professionalism
A9: Impact of engineering on society/environment
A10: Ethics and equity
A11: Economics and project management
A12: Life-long learning

Competency Levels
1 - Knowledge (Able to recall information)
2 - Comprehension (Ability to rephrase information)
3 - Application (Ability to apply knowledge in a new situation)
4 - Analysis (Able to break problem into its components and establish relationships)
5 - Synthesis (Ability to combine separate elements into a whole)
6 - Evaluation (Able to judge the worth of something)

Learning Outcomes
1. Understand the operation of basic digital circuits, and the ability to describe and design basic digital circuits.
2. Understanding how basic digital circuits can be combined into a programmable digital system, and the interfacing to and code execution of these systems.
3. Understanding the basic construction, operation and terminal analysis of a DC machine.
4. Understanding the basic construction, operation and terminal analysis of an AC machine.

Expected Competency Levels

<table>
<thead>
<tr>
<th>Outcome</th>
<th>A1</th>
<th>A2</th>
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<th>A4</th>
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<th>A6</th>
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Evaluation

Students must receive a minimum of 50% on the final examination in order to be eligible to receive a passing grade. Programmable calculators are not allowed in the mid-term test and final examination. Students must complete all laboratories to be eligible to receive a passing grade.

<table>
<thead>
<tr>
<th>Component</th>
<th>Value (%)</th>
<th>Method of Feedback</th>
<th>Learning Outcomes Evaluated</th>
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<tbody>
<tr>
<td>Assignments</td>
<td>2.5</td>
<td>F, S</td>
<td>1, 2, 3</td>
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<td>Quizzes</td>
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<td>1, 2, 3, 4</td>
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<tr>
<td>Laboratories</td>
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<td>F</td>
<td>1, 2, 3, 4</td>
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<td>F, S</td>
<td>1, 2</td>
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<tr>
<td>Final Examination</td>
<td>50</td>
<td>S</td>
<td>1, 2, 3, 4</td>
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</table>

* Method of Feedback: F - Formative (written comments and/or oral discussion), S - summative (numerical grade)

Academic Integrity

Students are expected to conduct themselves in accordance with the highest ethical standards of the Profession of Engineering and evince academic integrity in all their pursuits and activities at the university. As such, in accordance with the General Academic Regulations on Academic Integrity, students are reminded that plagiarism or any other form of cheating in examinations, term tests, assignments, projects, or laboratory reports is subject to serious academic penalty (e.g., suspension or expulsion from the faculty or university). A student found guilty of contributing to cheating by another student is also subject to serious academic penalty.

Updated: 05 January 2015