ECE 7440 – REAL-TIME INTERFACING
COURSE OUTLINE – FALL 2014

COURSE DESCRIPTION
This course presents real-time wired and wireless interfacing of microcontrollers, microprocessors, and microcomputers to the external world, including interfacing of I/O devices with minimum hardware and software, data acquisition with and without microprocessors, data communications, transmission and logging with embedded computers.

CONTACT HOURS
3 hours/week
Monday, Wednesday, Friday; 9:30 to 10:20 AM

COURSE OBJECTIVE
To master interfacing techniques of real time systems;
To understand bus architectures digital synchronization, signal conversions, data communications; and
To apply those techniques in engineering.

PRE-REQUISITES
Electronics (e.g., ECE 2160)
Microprocessing Systems (e.g., ECE 3610)

COURSE CONTENT
The following topics will be covered:
- Introduction on computing, architectures, processors, and technologies
- Bus architectures
- Digital I/O
- D/A and A/D signal conversions and converters
- Interfacing aspects in data communications
- Updates on new concepts, technologies, protocols, and software
  - Demos: Examples of bus architectures, modules, systems, and new devices.
  - Updates on new computer concepts, technologies, protocols, and software.

HOMEWORK
1. Assignments/MiniLabs: (Distributed in class. Reports required.)
2. Project (Select one or propose one (a sample list will be distributed in class). Completion of a project requires:
   (i) Submission of a project proposal three weeks after the commencement of this course;
   (ii) Submission of a written project report in the IEEE format (as used in The Proceedings of the IEEE main journal) one week before the end of this course; and
   (iii) Oral project presentation at the end of the course (date set in class).

TEXTBOOK
OTHER REFERENCES


EVALUATION

Your final course grade is determined by your performance in assignments, term test, and a final examination. The weighting of each of these components is as follows:

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>VALUE</th>
<th>DETAILS</th>
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</thead>
<tbody>
<tr>
<td>Homework</td>
<td>10</td>
<td>Four assignments and one mini-project</td>
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<tr>
<td>Project</td>
<td>40</td>
<td>One major project. Proposal in two weeks from commencement of course</td>
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<tr>
<td>Term Tests</td>
<td>20</td>
<td>Two midterms.</td>
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<tr>
<td>Final Examination</td>
<td>30</td>
<td>Closed book, two-hour exam.</td>
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INSTRUCTOR INFO

Name: W. Kinsner, PhD, PEng, FEIC, FEC  
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Email: witold.kinsner@umanitoba.ca  
Office Hours: After each lecture, or by appointment

VOLUNTARY WITHDRAW

November 12, 2014

REQUIREMENTS/REGULATIONS

- Student Responsibilities: It is the responsibility of each student to contact the instructor 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 Sections 4 and 6 of the Regulations dealing with incomplete term work, deferred examinations, and attendance and withdrawal.
  - Lectures: Attendance at lectures is essential for successful completion of this course. Students must satisfy each evaluation component in the course.

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 and Requirements of the University of Manitoba, Section 7.1, students are reminded that plagiarism* or any other form of cheating in examinations, assignments, laboratory reports or term tests is subject to serious academic penalty (e.g. suspension or expulsion from the faculty or university). A student found guilty of contributing to cheating in examinations or term assignments is also subject to serious academic penalty

*Plagiarism: to steal and pass off (the ideas or words of another) as one's own : use (another's production) without crediting the source