Course Outline

Instructor
- Prof. Ioan Ciric, P.Eng.
  E3-511 EITC
  (204) 474-9498
  Ioan.Ciric@umanitoba.ca

Office Hours
- Thursdays, 3pm – 5pm
  or by appointment

Teaching Assistant
- TBD

Contact Hours
- 4 credit hours
- Lectures
  3 hours × 13 weeks = 39 hours
- Tutorials
  3 hours × 6 weeks = 18 hours

Prerequisites:
- ECE 3590 Electromagnetic Theory

Important Dates
- Term Test
  February 24th, 2015 (in class)
- 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

Course Objectives
This course will cover various topics, including: plane, cylindrical and spherical waves, waveguides, field-matter interactions, and introduction to wave scattering and diffraction.

Course Content
The following topics will be covered:
- Fields in solid conductors
- Guided waves
- Interaction of fields and matter
- Basic radiating systems
- Elements of scattering and diffraction

Textbook
Course notes available from the instructor.

Other Resources

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.

Faculty of Engineering
Department of Electrical and Computer Engineering

ECE 4280 – Engineering Electromagnetics

Winter 2015
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 (Able to combine separate elements into a whole)
6 - Evaluation (Able to judge the worth of something)

Learning Outcomes
1. Application of Maxwell’s equations to specialized areas of engineering electromagnetics.
2. Modelling, formulation, and solution of engineering problems in unbounded and bounded regions with isotropic and anisotropic materials.
3. Derivation of specific equations and their application to the analysis of waveguides and the propagation of waves in a plasma and in ionosphere in the presence of Earth’s magnetic field.
4. Field equations solution and analysis of basic optical fibers and of classical scattering and diffraction configurations.
5. Application of the field problem solutions to the design of hollow single conductor waveguides, planar and circular dielectric waveguides, and of metallic devices operating in the plasma frequency range.

Expected Competency Levels

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<th>Outcome</th>
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Evaluation
The final course grade is determined by the student's performance on assignments and on examinations. Calculators are not allowed on the mid-term and final exam. Students must complete all the assignments in order to be eligible to receive a passing grade.

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<tr>
<th>Component</th>
<th>Value (%)</th>
<th>Method of Feedback</th>
<th>Learning Outcomes Evaluated</th>
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<td>Assignments</td>
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* 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.