ECE 7440 – Advanced Transmission Line Theory
COURSE OUTLINE – WINTER 2015

COURSE DESCRIPTION:
This course covers advanced topics in transmission line theory, analysis, and applications. It also provides an introduction to common software packages used in transmission line simulations.

COURSE OBJECTIVE:
Transmission lines have applications in a wide range of areas, from electronic circuits to power systems. The objective of this course is to provide the fundamental theory of multiconductor transmission lines (MTL), frequency-domain and time-domain solution of multiconductor transmission line equations, and practical applications. Further, classic numerical techniques are reviewed and their application in the simulation of transmission lines is presented.

PRE-REQUISITES:
ECE 3590 Electromagnetic Theory (or equivalent) and ECE 3720 Electric Power and Machines (or equivalent)

CONTACT HOURS:
3 lecture hours per week.
Time and day of the lectures will be decided on the first lecture.

COURSE CONTENT:
Part A: Transmission Line Theory
1. Review
2. The multiconductor transmission-line equation
3. The per-unit-length parameters
4. Frequency-domain analysis
5. Time-domain analysis
6. Incident-field excitation of the line

Part B: Review of Computational Electromagnetics
1. Finite difference techniques
2. Finite element method
3. Method of moments

Part C: Application of Numerical Techniques in the Analysis of Transmission Lines

HOMEWORK:
Bi-weekly assignments will be given.

TEXTBOOK:
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:

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<th>COMPONENT</th>
<th>NO</th>
<th>VALUE %</th>
<th>TOTAL VALUE</th>
<th>DETAILS / ADDITIONAL INFO</th>
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<tbody>
<tr>
<td>Seminars</td>
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<td>Homework/Assignments</td>
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<td>10%</td>
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<td>Project</td>
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<td>Final Examination</td>
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<td>TOTAL</td>
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INSTRUCTOR INFO:

Name: Prof. Behzad Kordi, Ph.D., P.Eng.
Office: SPC 308
Tel: (204) 474 7851
Email: Behzad.Kordi@umanitoba.ca

Office Hours: by appointment.

VOLUNTARY WITHDRAW:

Thursday, Mar. 19, 2015

REQUIREMENTS/REGULATIONS

- Student Responsibilities: It is the responsibility of each student to contact the instructor if he/she is uncertain about his/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 is subject to serious academic penalty (e.g. suspension or expulsion from the faculty or university) regardless of media.

- examinations
- assignments
- laboratory reports
- term exams

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.