COURSE CALENDAR DESCRIPTION

Introduces fundamental principles underlying design and analysis of digital communication systems. Develops mathematical/physical understanding from the information source through the transmitter, channel, receiver, and information sink. Topics include baseband transmission, matched filtering, modulation, channel coding, and spread spectrum. Prerequisites: cumulative GPA of 4.50 or better over all major EECS courses (without second digit "5"); LE/EECS 3213 3.00; One of SC/MATH 2030 3.00 or SC/MATH 2930 3.00; One of LE/EECS 3451 4.00, LE/EECS 3602 4.00, LE/ESSE 4020 3.00, SC/MATH 4830 3.00, SC/PHYS 4060 3.00 or SC/PHYS 4250 3.00. Previously offered as: LE/CSE 4214 4.00. PRIOR TO SUMMER 2013: course credit exclusion: SC/CSE 4214 4.00.

INSTRUCTOR(S)

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<tr>
<th>Name</th>
<th>Section / Format / Term</th>
<th>Contact Email</th>
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<tr>
<td>Sodagar, Amir</td>
<td>Sec. E / LECT / F</td>
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ADDITIONAL INFORMATION

Main Topics
Digital communications overview
Mathematical descriptions of deterministic signals
Mathematical descriptions of random signals
Linear systems
Analog-to-digital conversion
Pulse modulation
Baseband modulation & detection
Inter-symbol Interference
Equalization
Bandpass modulation & detection
Error performance
Codes & decoders

COURSE LEARNING OUTCOMES

After successful completion of the course, students are expected to be able to:
- Express and manipulate random signals in terms of probabilities and statistical averages.
- Understand and quantify the performance of key pulse code modulation systems.
- Understand and apply the theory of optimum detectors and filters for pulse amplitude modulation systems.
- Explain the operation of sequence detection methods.
• Describe the theory and operation of bandpass modulation and detection systems.
• Design and build system components capable of enabling optimum digital communication.

Grading Policy
25%: Labs
15%: Quizzes
20%: Midterm
40%: Final Exam

Textbook

Attendance
Class attendance is strongly encouraged. Each student is responsible for all assignments, announcements, and material covered in each class. Lectures will start promptly at the time announced for the course. Your punctuality is expected and greatly appreciated.

Reading Assignments
Reading assignments include sections of the textbook, supplementary notes, on-line material, etc. Students are responsible for both lecture material and reading assignments in all the exams.

Quizzes
There will be four open-book surprise quizzes in class. Each quiz takes 10 minutes sharp. See the grading policy table for the breakdown of marks. Please be informed that top 3 of your 4 quiz marks will be counted.

Midterm Exam
There will be a closed-book midterm exam in class. See the grading policy table for the breakdown of marks.

Final Exam
The final exam will be closed-book. See the grading policy table for the breakdown of marks.

Missed Exams
If you miss a midterm exam without a certified medical document or prior instructor approval, a zero will be averaged into your grade. Certified excuses and prior approval will be dealt with individually. Generally, the missed exam will be held at a designated time near the end of the semester and before the final exam. This means that there will be only one make-up test. To request an excused absence: 1- write a formal letter to me, dated and signed, stating your specific request and the reason you are asking for an excused absence; 2- provide documentation supporting your request; 3- bring this letter and the documentation to me in person before the requested date (if an absence is foreseeable) or within one week after the absence (if it is of unforeseeable nature), at the time your request will be discussed. Special cases will be dealt with individually.

If you miss a quiz, no compensation is envisioned. Please plan to attend classes and always be prepared for a quiz.

Labs
Students are strongly encouraged to attend all lab sessions, do the labs individually, and turn in the reports on time. There will be a mark penalty of 50% for the late submission of lab reports. Lab reports need to be in .pdf format, and the MATLAB source codes for each and every part/section of the lab need to be provided in the report (where applicable). The codes in your report should be complete in such a way that the TA can run them if needed.

ACADEMIC INTEGRITY LINKS
• Senate Policy on Academic Honesty - http://secretariat-policies.info.yorku.ca/policies/academic-honesty-senate-policy-on/
• Academic Integrity - http://lassonde.yorku.ca/academic-integrity
STUDENT LINKS

- Student Rights and Responsibilities - http://oscr.students.uit.yorku.ca/student-conduct
- Religious Observance - https://w2prod.sis.yorku.ca/Apps/WebObjects/cdm.woa/wa/regobs
- Counselling and Disability Services - http://cds.info.yorku.ca/
- York University’s Policies on Gender/LGBTQ*/Positive Space - http://rights.info.yorku.ca/lgbtq/

LAND ACKNOWLEDGEMENT

- We acknowledge our presence on the traditional territory of many Indigenous Nations. The area known as Tkaronto has been care taken by the Anishinabek Nation, the Haudenosaunee Confederacy, the Huron-Wendat, and the Mètis. It is now home to many Indigenous Peoples. We acknowledge the current treaty holders, the Mississaugas of the New Credit First Nation. This territory is subject of the Dish With One Spoon Wampum Belt Covenant, an agreement to peaceably share and care for the Great Lakes region.
- The Indigenous Framework for York University: A Guide to Action can be found here: http://indigenous.info.yorku.ca/
- Meaning of a land acknowledgement: http://healthydebate.ca/opinions/indigenous-land-acknowledgements

Many courses utilize Moodle, York University's course website system. If your course is using Moodle, click here to access it.

Moodle @ York University