ECE 7170: Queueing Theory for Telecommunications
COURSE OUTLINE – FALL 2014

COURSE DESCRIPTION:
Introduction to basic queueing theory for application to telecommunication network engineering problems

COURSE OBJECTIVE:
To give students enough background to be able to model and evaluate delay and loss problems in telecommunication networks.

PRE-REQUISITES:
At least a second year probability and statistics course and a numerical method course

CONTACT HOURS:
3 hours a week for lectures

COURSE CONTENT:
- Introduction to Markov chains
- Finite state Markov chains
- Infinite state Markov chains
- Birth-and-death and Quasi-birth-and-death processes, using matrix-geometric approach for the analysis
- The GI/M/1 type and the M/G/1 type Markov chains, using matrix-analytic approach for the analysis
- Transform methods for analyzing QBDs, GI/M/1 and M/G/1 systems
- Single node queues
- Arrival and service processes for queues
- Phase type distributions
- Parameter Estimation for arrival and service times distributions
- Queueing models for the Internet traffic
- Queueing models for mobile communications
- Queueing models for special classes of communication systems
HOMEWORK:
TBA

TEXTBOOK:
There is no compulsory text book, but the following books are helpful:


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>
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<td>Seminars</td>
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<td>Homework/Assignments</td>
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<td>Project</td>
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INSTRUCTOR INFO:
Attahiru S Alfa
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Email: attahiru.alfa@umanitoba.ca
Office Hours: TBA
VOLUNTARY WITHDRAW:

Wednesday, Nov. 12, 2014

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