

FALL 2021

ECE 7260 – Broadband Communication Networks

**COURSE DESCRIPTION:**

This course provides fundamentals for designing and analyzing broadband communication networks. The major content includes: structure and organization of broadband communication networks, underlying principles, typical protocols and technologies applied in broadband communication networks, mathematical network modeling and performance analysis.

**COURSE OBJECTIVE:**

The goal of this course is to provide a fundamental understanding of the principles of broadband communication networks, discuss the major protocols and technologies used, and the methods for performance analysis and modeling of these networks.

**PRE-REQUISITES:**

Undergraduate level Probability Theory & Random Processes

**CONTACT HOURS:**

3-hours per week

**COURSE CONTENT:**

The following topics will be discussed:

- Introduction and layered network architecture;
- Traffic characterization;
- Point-to-point protocols and links;
- Delay models;
- Multiaccess communication and call admission control;
- Routing, flow, and congestion control;
- Mobility management;
- Stochastic bounds and effective capacity.

Additional advanced research topics as determined by the instructor.

**HOMEWORK:**

Homework will consist of assignments, and/or preparation of a seminar on an assigned article from the research literature, and an individual research project.

**REFERENCE BOOKS:**

Mischa Schwartz, Telecommunication Networks: Protocols, Modeling, and Analysis, Addison-Wesley, 1988.  
Dimitri Bertsekas and Robert Gallager, Data Networks, 2nd Edition, Prentice-Hall, 1992.  
Mischa Schwartz, Broadband Integrated Networks, Prentice Hall, 2002.

**GRADE ANNOUNCEMENTS:**

Grades for this course will be announced by January 2022

#### EVALUATION:

Your final course grade is determined by your performance in the components list below in the Evaluation Table (seminar, assignments, project, mid-term, and a final examination. Students must receive a minimum of 50% on the final examination and must complete and pass all components in the course in order to be eligible to receive a passing grade.

Each component is weighted as follows:

COMPONENT	NO	VALUE %	TOTAL VALUE	DETAILS / ADDITIONAL INFO
Seminars	2	20%	20	
Project	1	30%	30	
Final	1	50%	50	
<b>TOTAL</b>			100	

#### GRADE SCALE:

LETTER	MARK	LETTER	MARK	LETTER	MARK	LETTER	MARK
A+	95-100	B+	80-84	C+	65-69	D	45-54
A	85-94	B	70-79	C	55-64	F	<45

#### INSTRUCTOR INFO:

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Office Hours:..... By appointment

#### VOLUNTARY WITHDRAW:

**TBD**

#### 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 his/her potential for receiving a failing grade. Students should also familiarize themselves with Sections 4 and 6 of the Regulations dealing with, among others, incomplete term work, deferred examinations, attendance and withdrawal, etc.

**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

Please refer any questions regarding Academic Integrity to your course instructor.

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