



FALL 2020

## ECE 8150 – Digital Signal Processing

### COURSE DESCRIPTION:

Fundamentals of discrete-time signals, systems and modern digital signal processing. The course will then serve as a fast review of basic concepts of signal processing to take on more advanced topics in digital signal processing such as time-varying filtering, and spectral estimation methods.

### COURSE OBJECTIVE:

The course covers fundamentals of discrete-time signals, systems and modern digital signal processing. Intended to be a first course on the topic at the graduate level to prepare students for subsequent courses such as Signal Theory and Image Processing

### PRE-REQUISITES:

Signal processing at the undergraduate level: ECE 3780

### CONTACT HOURS:

Two times a week, one and a half hours each

### COURSE CONTENT:

The following topics will be discussed:

- Introduction to Discrete-Time Signals and Systems
- The Z-Transform and its Application to the Analysis of LTI Systems
- Frequency Analysis of Signals
- Frequency Domain Analysis of LTI Systems
- The Discrete Fourier Transform
- Structures for FIR and IIR Systems
- Linear Prediction and Optimum Filters

Additional advanced research topics as determined by the instructor.

### HOMEWORK:

Homework will consist of assignments and Matlab based projects.

### TEXTBOOK:

Digital Signal Processing by Proakis and Manolakis, Prentice-Hall, Fourth Edition

### GRADE ANNOUNCEMENTS:

**TBA – Due to COVID-19, this date to be announced by the Registrar's Office**

## EVALUATION:

Your final course grade is determined by your performance in assignments, a research seminar, a course project, and a final examination. The weighting of each of these components is as follows:

COMPONENT	NO	VALUE %	TOTAL VALUE	DETAILS / ADDITIONAL INFO
Assignments	5	7 %	35	
Midterm exam	1	30%	30	
Final Examination	1	35%	35	
<b>TOTAL</b>			100	

## INSTRUCTOR INFO:

Name:..... Gabriel Thomas  
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Office Hours: ..... By appointment

## VOLUNTARY WITHDRAW:

**November 23, 2020**

## 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