



FALL 2017

## ECE 7190 – Micromachining and MEMS

### COURSE DESCRIPTION:

Introduces students to micromachining and micro-electro-mechanical systems (MEMS). Topics include microfabrication technologies, microactuators, and microsensors. Applications to optical, electrical, mechanical, chemical, and biological systems are discussed.

### CONTACT HOURS:

3-hours per week

### COURSE CONTENT:

The following topics will be discussed:

- A. Introduction and overview
- B. Microelectronic fabrication technologies
- C. Micromachining techniques
- D. Mechanical transducers
- E. Optical transducers
- F. Thermal transducers, flow sensors
- G. Magnetic sensors, actuators, electromagnetic devices
- H. Chemical and biological transducers
- I. Microfluidic devices, sensors, pumps, valves

Additional advanced research topics in embedded computing as determined by the instructor.

### HOMEWORK:

Two written projects, to be presented in class.

### TEXTBOOK:

TBD

### EVALUATION:

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

COMPONENT	NO	VALUE %	TOTAL VALUE	DETAILS / ADDITIONAL INFO
Homework/Assignments				
Project/Seminar	2	25%	50	
Final Examination	1	50%	50	
<b>TOTAL</b>			100	

## INSTRUCTOR INFO:

Name: ..... Cyrus Shafai  
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Email: ..... Cyrus.Shafai@umanitoba.ca

Office Hours: ..... By appointment

## VOLUNTARY WITHDRAW:

**Friday, 17 November 2017**

## 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