UNIVERSITY OF TORONTO
DEPARTMENT OF MECHANICAL AND INDUSTRIAL ENGINEERING

MIE1080 ***Introduction to Healthcare Robotics*** ***Winter, 2021***

SYLLABUS

Instructor:

Prof. Yu Sun & guest lecturers
E-mail: sun@mie.utoronto.ca
Tel: 416-946-0549
Office: MC419

Time: 2:00-5:00pm, Mondays

Course Description:

This course provides students with knowledge on healthcare robotics including surgical, assistive, and rehabilitation robots. Specific topics include medical imaging-guided surgery; minimally-invasive surgery through miniaturization, novel actuation and sensing; robotic surgery at tissue and cell levels; autonomous robotic systems to assist with daily living activities; multi-modal robot interfaces; robotics-based rehabilitation technologies; upper limb rehabilitation robots; wearable exoskeletons and sensors; implanted neural interfaces. Students are provided with state-of-the-art advances in healthcare robotics.

Grading:

During the semester,

- Surgical Robotics
  - 10% - submit a report on Surgical Robotic Systems (10 pages)
  - 5% - student presentation
- Rehabilitation Robotics
  - 10% - submit a report on Rehabilitation Robotic Systems (10 pages)
  - 5% - student presentation
- Assistive Robotics
  - 10% - submit a report on Assistive Robotic Systems (10 pages)
  - 5% - student presentation

At the end of the semester,

- 55% - submit a term paper (15 pages)

Required Textbook:

- None.

Schedule: (subject to changes during semester)

Week 1	Introduction of healthcare robotics (Yu Sun)
Week 2	Surgical robotics (guest lecturer)
Week 3	Surgical robotics (guest lecturer)
Week 4	Surgical robotics (guest lecturer)
Week 5	student presentations and discussion on surgical robotic systems (Yu Sun)
Week 6	Rehabilitation robotics (guest lecturer)
Week 7	Rehabilitation robotics (guest lecturer)
Week 8	Rehabilitation robotics (guest lecturer)
Week 9	student presentations and discussion on rehabilitation robotic systems (Yu Sun)
Week 10	Assistive robotics (guest lecturer)
Week 11	Assistive robotics (guest lecturer)
Week 12	Assistive robotics (guest lecturer)
Week 13	student presentations and discussion on assistive robotic systems (Yu Sun)