Summer 2017 -2018
INSE 691: Systems Modeling and Simulation
(4 credits)

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Course Timings:

Days	Timings	Room	Location
Monday, Friday	17:45-20:15 pm	MB 5.265	SGW

Office Hours: Fridays, 12:00 pm - 2:00 pm

Prerequisite: None

Course Description:
This course aims to provide theoretical and practical knowledge on advanced systems modeling and simulation to graduate students. The topics include, fundamentals of systems simulation, what is a system, what is simulation, steps in constructing a simulation model, when to use simulation, process mapping, modeling of discrete and continuous systems, discrete event simulation, system dynamics simulation, uncertainty modeling, monte carlo simulation, agent based simulation, simulation based optimization, and large scale systems simulation. The course project will allow the students to apply the various tools and techniques taught in the course for addressing real-life problems in product- and service-oriented systems.

Textbook: None. Course Handouts will be used as primary reference.

Other References:
- Modeling and Simulation Fundamentals: Theoretical underpinnings and practical domains by John A. Sokolowski, Catherine M. Banks, Wiley Publications, 2010.
- Simulation for supply chain management by Caroline Thierry, Andre Thomas, Gerard Bel, Wiley Publications, 2008.
- Winter simulation conference archive, http://informs-sim.org/
- Simulation modeling and Arena by Manuel D. Rossetti, Wiley Publications, 2010.
- Arena, https://www.arenasimulation.com/academic/students
- Netlogo, https://ccl.northwestern.edu/netlogo/
- Vensim, http://vensim.com/

Course Schedule:

Week	Topics
Lecture 1: July 3	Introduction to simulation Statistical and queuing models
Lecture 2: July 7	Input modelling
Lecture 3: July 10	Conceptual model design and development
Lecture 4: July 14	*Selection of project topics, July 14* Output analysis Evaluating alternative configurations
Lecture 5: July 17	*Assignment 1, July 17, Lectures 1-4* Model verification and validation
Lecture 6: July 21	*Midterm (Lectures 1-5)* Tools for simulation
Lecture 7:July 24	Discrete Event Simulation
Lecture 8:July 28	Monte Carlo Simulation
Lecture 9:July 31	System Dynamics Simulation
Lecture 10:August 4	Agent based Simulation
Lecture 11:August 7	*Assignment 2, Aug 7, Lectures 5-10* Simulation based optimisation Large scale systems simulation
Project Report , August 9, 12-2 pm	
Final Exam (Lectures 1-11), TBD by Exams Office	

Course website: INSE 691 on Moodle, Accessible through myconcordia portal

Grade Composition

Homeworks (2)	10%
Project	20%
Midterm Exam	30%
Final Exam	40%

Note:
1. There is no direct mapping between numerical percentage grades and final letter grades for the course.

2. The projects are to be done in groups of 3-5 students. Project reports should be submitted at the time of presentations.
3. There are two homework assignments. Assignments are to be done in groups of 3-5 students and submitted both in paper form and online via the electronic assignment submission system (https://fis.encs.concordia.ca/eas/) before the due dates. Late submissions will be penalized.
4. **The students should be present on the dates of project presentations, midterm and final exam**. Alternate date requests will not be entertained other than in health related emergency cases.

Student expectations

Students are expected to attend every class. Some material may only be covered in class and not made available on the course website. You are expected to read the assigned material and actively participate in class discussions. You are expected to be respectful of other people's opinions and to express your views in a calm and reasonable way. Disruptive behaviour will not be tolerated. The Code of Rights and Responsibilities is available at: http://rights.concordia.ca

If you cannot attend class for any reason, unforeseen or not, you are required to come and talk or write to me as soon as possible.

Academic code of conduct

Any form of cheating, plagiarism, personation, falsification of a document as well as any other form of dishonest behaviour related to the obtention of academic gain or the avoidance of evaluative exercises committed by a student is an academic offence under the Academic Code of Conduct and **may lead to severe penalties up to and including suspension and expulsion.** For **e**xample, you are not permitted to:
- Copy from anywhere without indicating where it came from
- Let another student copy your work and then submit it as his/her own
- Hand in the same assignment in more than one class
- Have unauthorized material or devices in an exam. Note that you do not have to be caught using them – just having them is an offence
- Copy from someone's else exam
- Communicate with another student during an exam
- Add or remove pages from an examination booklet or take the booklet out of an exam room
- Acquire exam or assignment answers or questions
- Write an exam for someone else or have someone write an exam for you
- Submit false documents such as medical notes or student records
- Falsify data or research results

You are subject to the Academic Code of Conduct. Take the time to learn more at http://provost.concordia.ca/academicintegrity/

Student Services

To know about the student services offered at Concordia University, visit the following links:

- **Concordia Counselling and Development** offers career services, psychological services, student learning services, etc.
  http://cdev.concordia.ca
- **The Concordia Library Citation and Cycle Guides:**
  http://library.concordia.ca/help/howto/citations.html
- **Advocacy and Support Services:**
  http://supportservices.concordia.ca
- **Student Transition Centre:**
  http://stc.concordia.ca
- **New Student Program:**
  http://newstudent.concordia.ca
- **Office for Students with Disabilities:**
  http://supportservices.concordia.ca/disabilities/
- **The Academic Integrity Website:**
  http://provost.concordia.ca/academicintegrity/

Disclaimer

In the event of extraordinary circumstances beyond the University's control, the content and/or evaluation scheme in this course is subject to change.