TERM YEAR
Fall 2021

ECE 7650 – Agent Based Modeling

COURSE DESCRIPTION:

Project based course on agent based modeling. Agent based modeling is a modeling and simulation paradigm as an alternative to discrete event modeling and simulation or system dynamics. The prevalence of this type of modeling and its utility has been made apparent during the pandemic.

COURSE OBJECTIVE:

Develop and discuss agent based models, with emphasis on real data inclusion and model verification and validation.

PRE-REQUISITES:

Programming skills. Some data analytics background is helpful.

CONTACT HOURS:

3/2 hours per week spanning both terms

COURSE CONTENT:

- Develop and discuss agent based models across a variety of application examples ranging from dynamical physical to those that include agents with agency of behavior.

Additional advanced research topics as determined by the instructor.

HOMEWORK:

Develop a framework for simple ABM during the first month, possibly extending an existing ABM. Develop one's own ABM for the remainder of the course. Two class presentations and participation during guest lectures. Ideally development of each student's ABM should be oriented to their area of interest.

TEXTBOOK:

An Introduction to Agent-Based Modeling: Modeling Natural, Social, and Engineered Complex Systems with NetLogo. By Uri Wilensky and William Rand. Several cornerstone ABM papers posted as required reading/studying. These are available on umLearn.

GRADE ANNOUNCEMENTS:

Grades for this course will be announced by May 2022

EVALUATION:

The final course grade is determined by your performance in the assignments, and the major project. Ideally the student project will target a publication like report, whether actually published or submitted is not material. This includes addressing the major concerns of ABM models, their verification and validation.

COMPONENT	NO	VALUE %	TOTAL VALUE	DETAILS / ADDITIONAL INFO
Seminars (Attendence)	1-2			Given by others doing ABM related research
Homework/Assignments	1	10%	10	Simple difference equation model to ABM
Small ABM Extension	1	30%	30	Presentation (proposal and model).
Project	1	70%	70	Presentation (proposal), model, and paper.
TOTAL			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:

Name   Bob McLeod
Office: E3 416 (Lab)
Tel: 474 7360
Email: mcleod@ee.umanitoba.ca

Office Hours: Any time.

VOLUNTARY WITHDRAW:

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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