

MODELLING AND SIMULATION

Applied Mathematics 3911/9570

An Introduction to Mathematical Modelling and Simulation.

Instructor:

Allan MacIsaac

Middlesex College Room 285

allanb@uwo.ca, ext. 88772

Text: (Don't buy book use online access)

“An Introduction to Computer Simulation Methods”, 3rd Edition, H. Gould and J. Tobochnik, Addison-Wesley Publishers, 1996, ISBN 0-201-50604-1

See below for draft version of text:

<http://www.opensourcephysics.org/items/detail.cfm?ID=7375&Attached=1>

I may introduce other books and papers as topics arise.

Evaluation:

up to 6 assignments: 60%

Major Project Write-up: 30%

Major Project Class presentation: 10%

Note: This course is offered as an undergraduate course (AM3911) with shared lectures. The assignments for AM9570 will include additional questions beyond those set for AM3911.

If you miss an assignment with permission (see below) then I will re-weight the remaining assignments.

Class: Tuesday 2:30- 5:30 WSC 240

Office hours: (tentative)

Thursday 10:00am 12:00 noon

Any other time you can find me is also fine, if I'm not busy. Please make an appointment by email.

Some topics/methods we **may** cover:

1. Random Number Generators
2. Monte Carlo Integration: Hit/Miss Integration
3. Random Walks (RW)
4. Solving Laplace's Equation (and other DE's) using RW
5. Percolation and modelling of Forest Fires
6. Cellular Automata: Lattice Gas, Kauffman Model
7. Monte Carlo Simulation: Ising Model
8. Damage spreading, Fractals, Chaos
9. Molecular Dynamics: Hard Spheres and more
10. Other interesting things I like.

Addendum to all Applied Mathematics Course Outlines:

If you are unable to meet a course requirement due to illness or other serious circumstances, you must provide valid medical or other supporting documentation to your faculty's Dean's Office as soon as possible and contact your instructor immediately. It is the student's responsibility to make alternative arrangements with their instructor once the accommodation has been approved and the instructor has been informed. In the event of a missed final exam, a "Recommendation of Special Examination" form must be obtained from your faculty's Dean's Office immediately.

For further information please see: <http://studentservices.uwo.ca/secure/index.cfm>

A student requiring academic accommodation due to illness, should use the Student Medical Certificate when visiting an off-campus medical facility or request a Records Release Form (located in the Dean's Office) for visits to Student Health Services. The form can be found here:

https://studentservices.uwo.ca/secure/medical_document.pdf

Mental Health Statement:

Students who are in emotional/mental distress should refer to Mental Health@Western <http://www.uwo.ca/uwocom/mentalhealth/> for a complete list of options about how to obtain help.

Accessibility:

Please contact the course instructor if you require lecture or printed material in an alternate format or if any other arrangements can make this course more accessible to you. You may also wish to contact Services for Students with Disabilities (SSD) at 661-2111 ext. 82147 if you have questions regarding accommodation.

Support Services:

Learning-skills counselors at the Student Development Centre (<http://www.sdc.uwo.ca>) are ready to help you improve your learning skills. They offer presentations on strategies for improving time management, multiple-choice exam preparation/writing, textbook reading, and more. Individual support is offered throughout the Fall/Winter terms in the drop-in Learning Help Centre, and year-round through individual counseling.

Additional student-run support services are offered by the USC, <http://westernusc.ca/services>.

The website for Registrarial Services is <http://www.registrar.uwo.ca>.