

INSTRUCTOR: J. Sirker (Allen 515), Email: sirker@physics.umanitoba.ca

TEXTBOOKS:

There is no required textbook for this course. Course notes and assignments will be published online. However, you might want to consult some of the textbooks listed below for certain parts of the course:

- 1) Stephen Wolfram, *A new kind of Science* (Wolfram Media 2002).
- 2) JL Schiff, *Cellular Automata: A discrete view of the world* (John Wiley & Sons, 2011)

PROGRAMMING:

We will use Python 2/3. Programs can be written in a simple text editor, however, it is often more convenient to use a development environment such as Spyder or test programs in Jupyter notebooks.

COURSE OUTLINE:

1. COURSE OBJECTIVES
2. BUILDING A MODEL
3. BRIEF INTRODUCTION TO PROGRAMMING
4. SIMULATION OF RANDOM PROCESSES
5. SIMULATION OF SIMPLE DYNAMICAL SYSTEMS
6. CELLULAR AUTOMATA
7. AGENT-BASED MODELS