

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

**TEXTBOOKS:**

There is no required textbook for this course. Course notes and assignments will be published online on the course webpage [drop.physics.umanitoba.ca/~jsirker](http://drop.physics.umanitoba.ca/~jsirker). 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