

Physics 342 – Computational Modeling and Analysis

Fall 2017

Course website <http://coursespaces.uvic.ca> Assignments and other material will be posted and completed assignments are to be uploaded to this website.

Instructor Dean Karlen office: Elliott 217 karlen@uvic.ca (250) 721-6585
office hours: Drop in or by appointment

Class schedule Lectures: Monday, Thursday 8:30-9:50 CLE C109
Labs: Tuesday 2:30-3:50 ECS 108

Textbooks Required: Coursepack for this course is available at the bookstore
Optional: Any reference textbooks on Java and Python

Course objectives This course introduces students to the use of computers in physical science research. Behaviours of simple and complex physical systems are simulated by applying numerical methods to solve ordinary differential equations. Complex systems with a degree of unpredictability are treated using the concept of probability. Much of the course is devoted to statistical methods used to deal with uncertainties present in experimental measurements. Students will use Java and Python for coursework and need to have experience with at least one of these programming languages.

Topics Numerical solutions to ordinary differential equations, probability theory, Monte Carlo methods, testing hypotheses, parameter estimation, errors and confidence intervals

Grading There are weekly lab assignments/exams, short online quizzes, in-class questions, and three written exams, including an in-class final exam on November 30. The final grade is determined as follows:

Online quizzes	5%	In-class questions	5%
Lab assignments	30%	Midterm exams (2)	30%
Lab exams (3)	15%	Final exam	15%

The letter grades are obtained by converting the numerical scores as follows:

F	D	C	C+	B-	B	B+	A-	A	A+
0-49	50-59	60-64	65-69	70-72	73-76	77-79	80-84	85-89	90-100

Computer Students need a reliable portable personal computer capable of running Java that also has wireless networking for use in class, in the lab sessions, and for the lab exams.

Calculator For the in-class and final exams, the departmental policy will be followed: For all examinations the only acceptable calculator is the Sharp EL-510R. This calculator can be bought in the Bookstore for about \$10.

Course experience Near the end of term you will be invited to complete an anonymous survey regarding your learning experience. The survey site is: <http://ces.uvic.ca>