Physics 342 – Computational Modeling and Analysis Fall 2025

Course website https://bright.uvic.ca Assignments and other material will be posted and completed assignments are to be uploaded to this website.

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Office hours: In-person or via zoom: drop-by or by appointment.

Class schedule Lectures: Monday, Thursday 8:30-9:50 (CLE C108)
Labs: Thursday 2:30-3:50 (DSB C128)

Textbook Purchase the coursepack from the bookstore as a reference for lab and written exams.

Course objectives The course introduces students to the use of computers in the physical sciences. 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 short online quizzes, weekly lab assignments, and three written exams and lab exams, including a final exam on the last class session, December 2. The final grade is determined and converted to a letter grade as follows:

Online quizzes	5%		
Lab assignments	25%	Midterm exams (2)	30%
Lab exams (3)	25%	Final exam	15%

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 and Python with wireless networking for use in class, lab sessions, and for the lab exams.

Generative AI In this course I welcome the use of generative AI tools such as ChatGPT to help learn course material and complete lab assignments. Please note that you can opt for not using generative AI at all. In the case you opt to use generative AI for assignments, you must provide proper citation of the tools you used and describe how you used it. The written exams are held in class during the term, without computer access, and only the coursepack is allowed as a reference. The lab exams are done in lab without AI tools.

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