PHYSICS 420
Computational Physics

PHYSICS 580
Advanced Topics in Computational Physics

Instructor:	Dr. Kevin Beach	**Phone:**	492-7176
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Course objectives:

The goal of this course is to introduce computing as a tool for numerical problem solving in physics and to familiarize students with a variety of important methods and algorithms. We will consider problems drawn from classical and quantum mechanics, statistical physics, condensed matter physics, astrophysics, fluid dynamics, and medical physics. A detailed list of topics is available from the class website.

Undergraduate Prerequisites:

PHYS 234, 244, 381, MATH 337 or equivalent are required. PHYS 343, 311, 372, 472, 481 and familiarity with a modern system programming language (e.g., C) are recommended.

Lectures:	CCIS 4-285, Monday, Wednesday, Friday, 13:00 – 13:50
Lab:	CCIS L1-207, Thursday, 14:00 – 16:50
Office hours:	Just drop by or email me to make an appointment

Textbook: There is no required text. A list of recommended reading will be provided.

Examination schedule:

Final exam: Wednesday, December 14, 14:00 – 17:00

For study purposes, students may find it helpful to look over examinations, assignments, and labs from previous years. These are available from a link at the top of the class website.

Grading schemes:

Scheme A—undergraduate students and graduate students who elect not to undertake a project:

Assignments (5):	60%
Final exam:	40%

Scheme B—graduate students who turn in a term project:

Term project:	70%	proposal:	5%
		oral presentation:	15%
		code submission and written report:	50%
Assignments (3):	30%		

A curve appropriate to the class will be applied at the end of the term. The average mark is expected to be in the B+ range. This might be revised depending on the performance of the class as a whole.

Assignments:

Assignments will be set roughly every second week and will consist of a small computational project. The necessary instructions and computer code will be posted on the class website. Assignments are to be submitted electronically for grading.

Students may work co-operatively at the level of discussing algorithms and general approaches, but each student should implement his or her own, independent solution.

Weekly labs:

Attendance at weekly labs is not mandatory, and performance in the labs will not count towards the final grade. Nonetheless, students are strongly encouraged to take this part of the course seriously. Labs are the best opportunity students will have to develop their programming skills and to get hands-on experience in the computing environment where the final exam will take place.

Term project:

The project must be defined early on. Students should discuss potential topics with the instructor and submit a detailed outline within the first two weeks of class. It is important to select a project that can be carried out within the time frame of the course. Students are free to choose a project that is related to their thesis research area. Students whose project proposal is not deemed acceptable will revert to the non-project grading scheme.

The schedule for the project is as follows.

proposal:	September 19
oral presentation:	November 21, 23, or 25
final report:	December 7

Detailed guidelines for each element of the term project will be provided on the class website.

University policy regarding academic offences:

"The University of Alberta is committed to the highest standards of academic integrity and honesty. Students are expected to be familiar with these standards regarding academic honesty and to uphold the policies of the University in this respect. Students are particularly urged to familiarize themselves with the provisions of the Code of Student Behaviour (online at http://www.uofaweb.ualberta.ca/governance/studentappeals.cfm) and to avoid any behaviour which could potentially result in suspicions of cheating, plagiarism, misrepresentation of facts and/or participation in an offence. Academic dishonesty is a serious offence and can result in suspension or expulsion from the University."

Students are warned that passing off code from other sources as their own constitutes plagiarism.