UNIVERSITY OF CALGARY
DEPARTMENT OF PHYSICS AND ASTRONOMY
COURSE INFORMATION SHEET

Course: Physics 481, Computational Physics II

Lecture/Time/Session(s): L01: TR 17:00 - 19:00, ST 026, Fall 2009

Instructor(s): Dr. D. Hobill

Office: SB 539, 403-220-6965
Email: hobill@phas.ucalgary.ca
Office hours: MW, 13:30-15:00

Main PHAS Office: SB 605, 403-220-5385

Prerequisite: Physics 381, 455,
Prerequisite or Corequisite: Physics 443 or Chemistry 373

Note: *The Faculty of Science policy on pre- and co-requisite checking is outlined on page 203 columns 2 and 3, of the 2009-2100 Calendar. A student may not register in a course unless a grade of at least "C-" has been obtained in each pre-requisite course; it is the responsibility of students to ensure that their registrations are in order.*

Grading: The University policy on grading and related matters is described on pages 41-53 of the 2009-2010 Calendar. In determining the final grade in the course, the following weights will be used:

Assignments	40%
Mid Term Exam	15%
Final Exam	35%
Term Project	10%

Missed components of term work: The regulations of the Faculty of Science pertaining to this matter are outlined on pages 204, column 1, of the 2009-2010 Calendar. It is the student's responsibility to familiarize himself/herself with these regulations.

Textbook: **Instructor's notes will be used, no textbook required**

Department approval _____ Date: _____

SAFEWALK: *Campus Security will escort individuals day or night. Call 403-220-5333 for assistance. Use any campus phone, emergency phone or the yellow phones located at most parking lot pay booths.*

Academic misconduct *(cheating, plagiarism, or any other form) is a very serious offense that will be dealt with rigorously in all cases. A single offense may lead to disciplinary probation or suspension or expulsion. The Faculty of Science follows a zero tolerance policy regarding dishonesty. Please read the sections of the University Calendar under the heading "Student Misconduct" (pages 49-53 for 2009-2010).*

FOIP: *This course will be conducted in accordance with the Freedom of Information and Protection of Privacy Act (FOIP). As one consequence, students should identify themselves on all written work by placing their name on the front page and their ID number on each subsequent page.*

STUDENT UNION INFORMATION:

VP Academic: ***Phone:*** *403-220-3911,* ***Email:*** suvpaca@ucalgary.ca

SU Faculty Rep: ***Phone:*** *403-220-3913,* ***Email:*** sciencerep@su.ucalgary.ca

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The course will cover the tools and techniques that are used in solving problems that occur in different areas of physics. Both the computational and the numerical methods introduced will be applied to specific physical problems in order to demonstrate how they are to be used.

Course Content

1. Introduction to Linux

(a) basic commands

(b) file structure and manipulation

(c) utilities

2. LaTeX document preparation

(a) basic structures

(b) mathematical notation

(c) embedded graphics

3. Basic programming languages and methods

(a) C/C++

(b) FORTRAN 90/95

(c) procedural programming

(d) object-oriented programming

4. Basic Data analysis

(a) Graphical methods (GNUPlot X-Grace, etc)

(b) data manipulation (vectors, arrays of higher-dimension)

5. Programme and Shell control

(a) Shell scripts

(b) Make utility

6. Numerical Methods

(a) Root finding

(b) Matrix manipulation

(c) Numerical Differentiation

(d) Numerical Integration

(e) Differential Equations