

Computer Simulation in Science (PHYC 2050)

Department of Physics and Atmospheric Science, Winter 2010
Monday, Wednesday and Friday @ 9:35 - 10:25 in Dunn 302

Lecturer: Prof. Thomas J. Duck, Dunn 128
Office Hours: 3:30–4:30 PM on Mondays and Tuesdays

Web: <http://aolab.phys.dal.ca/~tomduck/classes/phyc2050/>

Computer Lab: Dunn 208

Overview: *Computer Simulation in Science* explores computer programming for the purpose of numeric computations. This class provides an introduction to the python programming language, and shows how to obtain solutions to differential equations using finite difference techniques.

Required background:

1. Basic computer usage (word processing, Internet, etc)
2. Differentiation and integration
3. Taylor series expansions
4. Differential equations

Topics:

1. The python programming language
2. Interpolatory differentiation
3. Numerical precision
4. Solutions to differential equations
5. Optimization problems
6. Advanced programming techniques

FOS grading scheme:

A+	90-100%
A	85-89.9%
A-	80-84.9%
B+	75-79.9%
B	70-74.9%
B-	65-69.9%
C+	62-64.9%
C	58-61.9%
C-	55-57.9%
D	50-54.9%
F	< 50%

Test dates:

Test I	January 25
Midterm	February 19
Test II	March 19
Final	to be scheduled

Grading:

Test I	10%
Midterm	25%
Test II	10%
Assignments ..	25%
Final	30%

continued on reverse

References:

There is no textbook for this course; however, the following online references may prove helpful.

- * **Introduction to Unix**, <http://www.doc.ic.ac.uk/~wjk/UnixIntro/>
- * **Unix Command Summary**,
<http://www.math.utah.edu/lab/unix/unix-commands.html>
- * **The Python Tutorial**, <http://docs.python.org/tutorial/>
- * **Numpy/SciPy Documentation**, <http://numpy.scipy.org/>
- * **A Guided Tour of Emacs**, <http://www.gnu.org/software/emacs/tour/>

UNIVERSITY REGULATIONS: Students should refer to the sections on University Regulations (<http://ug.cal.dal.ca/UREG.htm>) and Academic Regulations (<http://ug.cal.dal.ca/acrg.htm>) in the Dalhousie Academic Calendar (<http://ug.cal.dal.ca/index.html>).

CLASS POLICY ON COLLABORATION: Students are allowed to discuss assignments, but students must hand in their own work. Evidence of copying between students on assignment problems will result in a score of zero on the assignment for both students.

CLASS POLICY ON LATE ASSIGNMENTS: Assignments will not be accepted after the due date without prior approval by the lecturer.

CLASS POLICY ON MISSED TESTS: Alternative arrangements for completing missed tests will be made given the submission of appropriate documentation, as per Dalhousie's Academic Regulations.