# PHY407F Computational Physics

# Lab Assignments Policy

## Collaboration and lab groups policy

For lab collaboration, there are two options:

1. *No collaboration:* You work by yourself and do not partner with anyone.
2. *Lab partner, one lab handed in (highly recommended):* work with a lab partner, and one of you hands in a single lab report on behalf of both of you. The report must list both partners, and indicate what each partner's contribution was. You need to ensure that each partner contributes approximately equally to the work; you can share the load across different assignments.

**THE MOST IMPORTANT POINT ABOUT SUCCESS IN THIS COURSE: To save yourself work, do all your labs with a partner. You can only pair up; you can't form larger groups. You can switch who you pair up with from lab to lab. If you don't have a lab partner, you will be basically doing twice as much work as you really need to.**

Discussion of lab questions and ideas on how to approach the problems and checking that you got the same answer with other students are the types of collaboration that are allowed and encouraged in this class. However, **do not copy solutions found from any source**, e.g. other students (aside from your lab partner), websites, textbooks, etc. This is **plagiarism** and is a **serious academic offence** and we will take appropriate measures. If you do use previous material from a reference, you must cite that reference.

## Submitting your work

All labs will be posted and submitted using the *Assignments* tab on Quercus. If you upload your submission early, catch a mistake, and re-upload a new version, we will only mark the latest version. If you work with lab partner, only one of you makes a submission.

Each lab will be explicit about what needs to be handed in. You **must** hand in your assignments in two parts using the following naming conventions and formats.

1. python scripts (.py files).
   - **One .py file per question**. Combine the scripts for different parts of a question (e.g. parts a and b and c of a Question 2), into a single file. Do not combine questions (e.g. Questions 1 and 2) into a single file.
   - The **name of the file** must be in the following **format**:
     Lab<lab number>_Q<question number>.py
     - Correct example: Lab02_Q1.py
     - Incorrect examples: Lab101abc.py [Lab10? Lab1?], L08.py [which Question?], sort.py [which lab?]
   - Each python program should have a **header**, indicating what the program does, and the **author(s)** listed at the **top**. If you collaborated with a lab partner, please indicate in the header **who wrote which part(s)** of the code.
   - You can include your "pseudocode" in the form of comments in the .py files, or in the main report file (#3 below). If pseudocode is in the .py file, say so in the pdf so that your marker knows.
   - If pieces of code were given for you to use as part of the lab question, these pieces must be included in your .py file (the markers won't add them on to your code).
   - Unless otherwise indicated in the question, the code should not import any libraries besides numpy, scipy, and matplotlib.
2. Any input files required for the above python scripts to run properly. Even if the input files were given out as part of the lab question, they must still be submitted.
3. Everything else, in a **single** main report file.
   - This is the file that the markers will look at first. It must be **.pdf or .doc(x) format**. It contains explanatory notes, pseudocodes (if you wish to put them here), figures, analysis.
   - At the **top** of the file include your **name**, the name of your partner (if any), and **who did which work**.
   - Solutions should be typed, unless there are numerous math expressions, in which case you can write those out by hand and submit a readable scan of those equations embedded in your pdf rather than type them out.

**All the code must run from the command line.** This means:

- **NO JUPYTER NOTEBOOKS** (.ipynb files). If you want to use Jupyter notebooks while working on your labs, you can always export them: as .py scripts for the code (remember to split them up, one file per question, rather than one big code file for the entire lab) and a .pdf for the report.
- **No interactive components** (e.g. don't require the user to enter input from the keyboard).

## Evaluation

Typical labs consist of three questions, where each question may have multiple parts. Each group submits one report and set of python scripts. Evaluation will consider correctness of solutions and the quality of solutions.

It is expected that lab solution is clear enough that another person can quickly and easily understand the problem being solved, the solution approach, and the solution itself. Thus:

- Solutions should be complete and well documented, with background and solution procedure. They should also be as concise as possible.
- Plots should be clear, well labelled, and well described.
- Codes provided should also have a clear logical structure, be set up to perform efficiently (although we don't expect you to know how to optimize performance), and be well documented.
- The grader should be able to run the code on their computer, on a reasonably recent version of python 3 (minimum python 3.6) with the Anaconda distribution, and reproduce your solution.
- **Even if your solution is correct, but not clear enough for the marker to understand quickly, the marker will remove some marks. Unreadable code or explanations are worthless, in physics as well as in any discipline!**

**Remarks on commenting your code:**

Code submitted for grading should be well commented so that someone unfamiliar with the specific question (but familiar with programming) can understand how the program works. Here are examples of helpful comments to include:

- At the beginning of your code: explain the purpose of the code, if it requires any external function calls and what the output is (e.g. a single value, graph of what?, output file with what data...)
- Use comments to explain your variable names and specify units of physical quantities.
- Comment the purpose of any user-defined functions
- Comment any long lines of mathematical operations with what they are calculating
- If you are using specific numerical methods, include those in comments where they are utilized.

**Lab grading rubric:** We will usually use a basic 10-point evaluation rubric for each question, with fractional points permitted. There are two cases, depending on whether your programs are included in the grading. (Please note that even if you are required to hand in your programs, they will not always be graded.) The rubric below is only indicative of a typical lab question.

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| **Case 1: Student is not required to hand in computer program with solution.** | Correctness (6/10) | Solution is missing/completely incorrect (0) or complete/perfect (6). |
| | Presentation (4/10) Solution is of very poor quality (0) or very well presented (4). | • Problem restated concisely in student's words.<br>• Solution procedure outlined, including pseudocode if required. (Pseudocode can contribute to a good solution, even if it is not required.)<br>• Text output is clearly presented (column format), plots are high quality (title, labels, captions, legends, clarity of graphics contribute to this). |
| **Case 2: Student is required to hand in computer program with solution.** | Correctness (6/10) | Solution is missing/completely incorrect (0) or complete/perfect (6). |
| | Presentation (2/10) Solution is of very poor quality (0) or very well presented (2). | • Problem restated concisely in student's words.<br>• Solution procedure outlined, including pseudocode if required. (Pseudocode can contribute to a good solution, even if it is not required.)<br>• Text output clearly presented (column format), plots are high quality (title, labels, captions, legends, clarity of graphics contribute to this). |
| | Computer program (2/10) Code provided is of very poor quality (0) or of excellent quality (2) | • Program is well structured, logic is easy for someone to understand.<br>• Program is well documented with comments and easy to understand variable names.<br>• Test of program is successful (occasionally used at instructor's discretion). |

**Regrade Requests:** If you feel a mistake was made in the grading of your assignment (e.g. addition of marks error, or you believe your solution is right even if it was marked wrong) then you may request a regrade of a specific question. In order to do so, you must send an email to a lab TA, specifically explaining what you would like looked at. You may only do so within 2 weeks of the date your assignment is graded. You may not request a regrade after this time.

## Late Policy and Extensions:

Submissions must be made online by Fridays at 5:00 PM for the assigned lab from that week. Labs will be made available on the Friday of the previous week. It is highly recommended that you start the lab BEFORE the lab time (Wed 9:00-12:00) so that you can spend the lab time talking to instructors and peers about issues that are confusing you.

Late labs will be accepted with a late penalty of 10% of the total lab grade per 24-hour period. Labs submitted after the following Monday at 5:00 PM will not be marked, since your penalty will have accumulated to 100%. Since submission is online, Saturdays and Sundays count as regular days and you can hand in late work on those days.

Non-penalized extensions to pre-lectures or labs are given only under exceptional circumstances (e.g. health issue). Circumstances such as extra-curricular activities (including University-sponsored activities) or other problem sets, and tests will not be considered as a valid excuse. If you need an extension, contact the instructor as soon as possible. If you have a medical excuse, please provide a copy of a doctor's note.

## Writing help:

Perhaps surprisingly, this course will involve some writing for you. Everyone could use help with writing; fortunately, UofT offers quite a lot:

- For general information about writing resources at U of T, you can start at the home page of the site Writing at The University of Toronto: https://writing.utoronto.ca.
- The FAS Writing Centres are listed at https://writing.utoronto.ca/writing-centres/arts-and-science.
- More than 60 Advice files on all aspects of academic writing are available from http://advice.writing.utoronto.ca. Printable PDF versions are listed at http://advice.writing.utoronto.ca/student-pdfs. In particular, see "How Not to Plagiarize" and other advice on documentation format and methods of integrating sources. These pages are all listed at http://advice.writing.utoronto.ca/using-sources.
- For group instruction on writing and study skills, check out the Writing Plus workshop series, described at http://writing.utoronto.ca/writing-plus.
- Information about the English Language Learning program (ELL) is available on the ELL website at http://www.artsci.utoronto.ca/current/advising/ell. You might want to engage in Reading eWriting, a free activity designed to boost scholarly reading and academic writing skills.

## Academic offences:

The following regulations are quoted from Section B of the University of Toronto Code of Behaviour on Academic Matters:

> B.i. 1. It shall be an offence for a student knowingly:
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> (b) to use or possess an unauthorized aid or aids or obtain unauthorized assistance in any academic examination or term test or in connection with any other form of academic work.
> (d) to represent as one's own any idea or expression of an idea or work of another in any academic examination or term test or in connection with any other form of academic work, i.e. to commit plagiarism.
>
> Wherever in this Code an offence is described as depending on "knowing", the offence shall likewise be deemed to have been committed if the person ought reasonably to have known.

In response to these regulations, we enforce the following policy:

**Student computational lab reports (both past and present) are unauthorized aids for the final exam, and making use of them *in any way* on the exam constitutes an academic offence.**

**An academic offence *in any computer lab report* could potentially lead to a mark of zero for three labs in the course.**