COURSE OUTLINE: PHYSICS 3MM3

Fall 2015

Instructor: Dr. Duncan O'Dell, ABB 320, Ext. 23189, dodell@mcmaster.ca

Teaching Assistants: Peter Hayman (ABB 327B, Ext. 21086, haymanpf@mcmaster.ca), and Jared Enns (ABB 327B, Ext. 21086, ennsjj@mcmaster.ca)

Text: D.J. Griffiths, *Introduction to Quantum Mechanics*, 2nd Edition.

The first meeting of this class will be Wednesday, September 9, 2015

Class times and Room: Mondays (11:30am-12:20pm), Wednesdays (11:30am-12:20pm), and Fridays (13:30-14:20), in ABB 136.

A prerequisite for this course is PHYS 2C03 *Modern Physics* (or its equivalent) and you are expected to already have some understanding of quantum mechanics at the **conceptual** level. The main purpose of this course is to begin to teach you how to do **calculations**.

We will be covering the first four chapters of the textbook (the rest will be covered in the 4th year.) A *tentative* schedule is as follows:

Week	Book	Topic
1	1.1—1.4	Schrödinger Eqn., Stat. Interpretation, Probability, Normalization
2	1.5—2.2	Momentum, Uncertainty, Stationary States, Infinite S.W.
3	2.3	Harmonic Oscillator
4	2.4	Free Particle
5	2.5	Delta Function Potential
6		*READING WEEK*
7	2.6—3.2	Finite S.W., Hilbert Space, Observables
8	3.1—3.5	Hermitian Operators & Eigenfunctions, Gen. Stat. Interpretation, Uncertainty Principle
9	3.6	Dirac Notation/Matrix Mechanics
10	4.1	Schrödinger Eqn. in Spherical Coords.
11	4.2	Hydrogen Atom
12	4.3	Angular Momentum
13	4.4	Spin

Please read the corresponding part of the book ***before*** we cover the subject in class so that **you** can ask useful questions. Although **all** the material in the first four chapters is examinable, we will not have time to go through all of it in class. Rather, I will use the book as a launching point, and will only highlight/discuss/build upon what I consider to be the key topics.

The course grade will be based on: Assignments+iclicker (35%), Mid-Term (25%) and Final (40%).

iClicker quizzes:

There will be iClicker quizzes in this course! If you have not used your iClicker in a while you should replace the batteries. Please make sure you have registered your iClicker this year. For details see:
https://campusstore.mcmaster.ca/information/faq/iclicker-faq.html or
https://www.physics.mcmaster.ca/phys1d03/iclicker_registration.html

Homework assignments:

Please show **all** your working and explain your logic and steps using words as necessary. Failure to do so makes your solutions hard to follow and the TAs will assume you have copied your answer from someone else, give you zero, and notify me. All integrals should be done by hand unless you are specifically told you may use a computer. For certain homework problems you will be asked to use Maple/Mathematica/Matlab or some equivalent. Please include a printout of the code you wrote so that it can be marked. Your homework should be submitted to me in class on the due date specified on the course website. If there are **exceptional one off** circumstances that cause you to miss a deadline please contact me immediately.

Policy on McMaster Student Absence Forms (MSAF):

My policy is to grant an accommodation of one week, e.g. if you miss a problem sheet I will grant you one extra week to submit it. All problem sheets contain learning and the exam questions are based upon them. It is therefore important that you complete them all. Remember, it is your responsibility to send me a separate email *within two working days of submitting your MSAF* so that we can communicate about the details of your accommodation.

Academic Ethics and Collaboration:

Academic dishonesty consists of misrepresentation by deception or by other fraudulent means and can result in serious consequences, e.g. the grade of zero on an assignment, loss of credit with a notation on the transcript (notation reads "Grade of F assigned for academic dishonesty"), and/or suspension or expulsion from the university.

It is your responsibility to understand what constitutes academic dishonesty. For information on the various kinds of academic dishonesty please refer to the Academic Integrity Policy, specifically Appendix 3, located at
http://www.mcmaster.ca/policy/Students-AcademicStudies/

The following illustrates only three forms of academic dishonesty:

1. Copying solutions for problems sheets from others or from the internet.
2. Plagiarism, e.g. the submission of work that is not one's own or for which credit has been obtained.
3. Improper collaboration in group work.
4. Copying or using unauthorized aids in tests and examinations.

DISCLAIMER: The instructor and university reserve the right to modify elements of the course during the term. The university may change the dates and deadlines for any or all courses in extreme circumstances. If either type of modification becomes necessary, reasonable notice and communication with the students will be given with explanation and the opportunity to comment on changes. It is the responsibility of the student to check their McMaster email and course websites weekly during the term and to note any changes.