Arts and Science 2D06: Course Outline for 2012/13

Instructor: Prof. Alan Chen, Department of Physics and Astronomy

E-mail: chenal@mcmaster.ca **Office:** ABB-260A

Office Hours: Mondays, 1:30-3:30pm

Required material:

• **Textbook:** Giancoli, Physics for Scientists and Engineers with Modern Physics, 4th Edition

• **Calculator:** McMaster standard calculator (CASIO fx991) – to be used for all quizzes and exams. Available in the campus bookstore.

A **website** will be used throughout the term for posting schedules, information, suggested problem sets from the textbook, last year's quizzes, historical links, etc. Here's the link:

http://www.physics.mcmaster.ca/~chenal/2D06/

Bookmark it and check it out weekly.

The website also contains links to other websites for readings on the history of physics and the development of ideas. These are required reading and will be mentioned at appropriate times during the course.

Marking scheme:

25% April exam
24% December exam
20% In-class quizzes (best 6 of 7 scheduled quizzes; 3.5% each for total of 21%)
21% Laboratory work (2 major projects, one each term, and one class presentation)
10% Participation in inquiry problems and project presentation days
The December and April exams and all laboratory work must be completed to pass the course.

The final percentage grade will be converted by the standard McMaster conversion scale:

12 = 90 – 100%	11 = 85 – 89%	10 = 80 – 84%
9 = 77 – 79%	8 = 73 – 76%	7 = 70 – 72%
6 = 67 – 69%	5 = 63 – 66%	4 = 60 – 62%
3 = 57 – 59%	2 = 53 – 56%	1 = 50 – 52%
0 = 49% or less		

Students must decide for themselves whether to seek and provide documentation to support requests for special consideration. This applies to any missed work, absences planned or unplanned, or any rescheduling of coursework. Students should keep a copy of anything handed in for marking (such as a project report).

Outline of Curriculum and Objectives

Course Objectives:

• To identify and discuss the underlying ideas, principles, and natural laws that describes a wide range of phenomena in the outside physical world: motion, forces, gravity, waves, fluids, light, space and time, quantum mechanics.

• To probe how scientific thinking and the progress of science is built on the twin principles of measurement and modeling.

• To study the historical development of the 'great ideas' in physics as developed by Archimedes, Galileo, Newton, Einstein, Bohr, de Broglie, Schrödinger, Heisenberg, and others; and to see how these ideas have influenced Western cultural history.

Outline for Term I:

• Newtonian Mechanics: Motion (kinematics) in one and two dimensions. Forces and Newton's three laws of mechanics. Friction, circular motion. Work, kinetic energy, potential energy, conservation of energy. Momentum and collisions. Rotational motion.

• Special Relativity: The speed of light, time dilation, length contraction, simultaneity, the Lorentz transformation. Momentum and energy in special relativity.

Outline for Term II:

• Fluid mechanics, hydrostatics, Archimedes' principle, Bernoulli's principle.

• Simple harmonic motion, wave motion, interference and diffraction of light.

• Quantum mechanics: early atomic theory, waves and probability, the uncertainty principle, the Schrödinger equation.

• General Relativity: the equivalence principle, curved space, black holes.

Academic Integrity Statement

McMaster Policy on Academic Integrity:

You are expected to exhibit honesty and use ethical behaviour in all aspects of the learning process. Academic credentials you earn are rooted in principles of honesty and academic integrity. Academic dishonesty is to

knowingly act or fail to act in a way that results or could result in unearned academic credit or advantage. This behaviour 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 types of academic dishonesty, please refer to the Academic Integrity Policy, located at:

http://www.mcmaster.ca/academicintegrity

The following illustrates only three forms of academic dishonesty: 1) Plagiarism—e.g., the submission of work that is not one's own or for which other credit has been obtained. 2) Improper collaboration in group work. 3) Copying or using unauthorized aids in tests and examinations.

MSAF Statement

McMaster Student Absence Form (MSAF):

This is an on-line, self-reporting tool for **students** to report absences that last up to 5 days and to request accommodation for any missed academic work that is worth less than 30% of the final grade. Please note that this tool cannot be used during any final examination period. It is the prerogative of the instructor to determine the appropriate relief for missed term work. You may submit a maximum of one request per term. The form should be filled out immediately when you are about to return to class after your absence. It is your responsibility to follow up with me immediately (within two working days) about the nature of the accommodation.
If you are absent for more than 5 days, have missed academic work worth 30% or more, or exceed one request per term, you must see Shelley Anderson in the Arts & Science Program office (C-105). You will be required to provide supporting documentation.

Email Contact and Student Responsibility Statement [Sample]

Please Note:

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 students to check their McMaster email and course websites weekly during the term and to note any changes. I will make announcements in class and by using the course e-mail distribution list.