ASTRONOMY 1F03

Course Outline Fall 2016

Dr. H. Couchman, ABB-317A   
Phone: 525-9140 x 27860   
email: *couchman@mcmaster.ca*

Teaching Assistants:  
Matthew Alessi ABB-253, alessimj@mcmaster.ca   
Samantha Benincasa ABB-253, benincsm@mcmaster.ca   
Fraser Evans ABB-244, evansfa@mcmaster.ca   
Corey Howard ABB-253, howardcs@mcmaster.ca   
Gandhali Joshi ABB-269C, joshigd@mcmaster.ca   
Angus Mok ABB-245C, mokakf@mcmaster.ca

Astronomy 1F03 is a one-term survey of astronomy and astrophysics, primarily for students in science or engineering programs but also for students with astronomy interests. Only limited mathematical or science knowledge is required.

The aim of the course is to present the major themes in present-day astronomy and astrophysics, and to show how they have evolved historically from our earliest concepts about the universe. Minor changes in course content, or order, from the following outline may occur, depending on the time available and the needs of the class. The course will combine a conceptual understanding with problem-based explorations of astronomy and astrophysics. In-class labs and demonstrations will be used to assist understanding. There will be outdoor observing sessions and planetarium shows offered as mandatory parts of the course. A component of the grade will result from using clickers.

**Topics**

* *The Sky:*Constellations, the celestial sphere, the seasons, phases of the Moon, eclipses of Sun and Moon.
* *The Foundations of Astronomy:*Historical development including the geocentric versus heliocentric models; the contributions of Copernicus, Kepler, Galileo, Newton, and others. Light and Matter; Telescopes.
* *The Solar System:*Modern survey of the solar system: the terrestrial planets, the giant planets and their satellites, comets, the Sun, the evolution and origin of the solar system. Planets around other stars. Life on other worlds.
* *Observing stars:*Motions and spectra of stars; the Doppler shift. Sizes and types of stars. Distribution of stars. The Interstellar Medium.
* *Stellar evolution:*The HR Diagram and its interpretation. Nuclear energy and fusion within stars; the basic ideas of stellar structure. The lives of stars: formation from interstellar gas, the main sequence, advance stages of evolution; end states including white dwarfs, neutron stars, and black holes.
* *Galaxies and Cosmology:*The Milky Way and galactic structure. Distance measurement to other galaxies; discovery of the expansion of the universe. Peculiar galaxies; quasars; clusters of galaxies. Cosmological models. The cosmic background radiation and the Big Bang. A history of the universe. Life in the universe.

Text: *Astronomy: A Beginner's Guide to the Universe*Chaisson & McMillan (Publisher: Pearson)

*Assessment:*  
25% Term work (in-class labs, approx. 6; problem sets, approx. 4)   
15% Participation (observing; planetarium; clickers)   
20% Mid-Term   
40% Final Exam

**Academic Dishonesty**

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, located at <http://www.mcmaster.ca/academicintegrity/>

The following illustrates only three forms of academic dishonesty:

* Plagiarism, e.g. the submission of work that is not one's own or for which other credit has been obtained. *Providing, requesting or using solutions, either in person or on-line via forums on avenue or elsewhere is not allowed. Do not ask others for answers to homework questions.*
* Improper collaboration in group work. *Note that discussion of homework with other students is ok. For in-class labs, students are encouraged to work together in groups but each student must submit their own lab paper for grading.*
* Copying or using unauthorized aids in tests and examinations.