PHYSICS & ASTRONOMY
SYLLABUS: SCI 238 – INTRODUCTORY ASTRONOMY
Winter 2016
Tue & Thur 4:00-5:20
DC 1351

CONTACT INFORMATION:

• Instructor:
  o Mike Hudson
  o Email: mjudson@uwaterloo.ca (put SCI 238 in subject line)
  o Office hours: Wed 3:30-4:30 in PHYS 252 or email for appointment
• TAs:
  o Britton Jeter bjeter@uwaterloo.ca
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COURSE DESCRIPTION:

A survey course in astronomy intended for Mathematics, Engineering and Science students. The solar system, the Sun and planets, stars, the Milky Way, galaxies and cosmology.

[Note: Students with a strong background in Physics and Mathematics should consider PHYS 175 instead of SCI 238. Offered: W,S]

Antireq: PHYS 175, SCI 237

PREREQUISITES:

• Some background in basic Physics (e.g. High School or PHYS 1xx level course at UWaterloo).
  o Students with weak background in Physics should consider SCI 237.

LEARNING OBJECTIVES:

• Conceptual and quantitative understanding of the major components of the Universe, their evolution and interactions.
• Application of basic principles of Physics to the above.
• Understanding how we know what we know about the Universe.
RESOURCES:

- **Textbook:**
  - Cosmic Perspective **Fundamentals** (2nd Edition) by J. Bennett, *et al.*
    - This is a shorter version of Cosmic Perspective (also by Bennett, *et al.*)
    - The first edition of Cosmic Perspective Fundamentals should contain most but possibly not all of the material. Editions of the (full) Cosmic Perspective contain more material than “Fundamentals”. These may also have different chapter and problem numbering. If you use any of these other editions, you are responsible for any missing material.
  - One copy of the 2nd edition of Fundamentals will be held on one-hour reserve in the Davis Library, call number UWD 1530.
  - We will **NOT** be using the online *Mastering Astronomy* for credit.

- **Clickers:**
  - This class will use clickers for in-class questions

- **Calculators:**
  - Only “Blue goggle”, “Pink tie” or “Yellow hardhat” calculators will be permitted for midterm and final exams.

TOPICS:

1. Introduction to the Universe (2 lectures)
2. Naked-eye astronomy: Motions of the earth, moon and planets; the historical development of astronomy (3 lectures)
3. The Solar System (3 lectures)
4. Extra-solar planets (1 lecture)
5. Stars: the Sun, observational properties, the structure of a star, stellar evolution (3 lectures)
6. Death of stars: supernovae and black holes (2 lectures)
7. Our Galaxy, the Milky Way: structure, the interstellar medium, star formation, dark matter halo (2 lectures)
8. Beyond our Galaxy: galaxies, quasars, etc. (2 lectures)
9. Cosmology: theories of the Universe (the Big Bang) (3 lectures)
10. Extraterrestrial life (1 lecture, if time permits)

ASSESSMENT:

- **Reading Assignments and Quizzes:**
  - There will be weekly reading assignments from the course textbook. These assignments and deadlines will be posted on the SCI 238 LEARN page as we go along, and assessed by multiple-choice quizzes conducted within LEARN. Note that many of the multiple-choice questions will be “recycled” in the midterm and final exams. By the end of the course, these reading assignments will have covered most of the textbook.

- **“Clicker” questions:**
  - In most lectures, there will be clicker questions, based on the reading assignments or concepts presented in class.

- **Films:**
There will be some films shown in this course. Material presented in films is part of the course and there WILL be questions asked in in-class quizzes and on the exams on this material.

- **Assignments:**
  - There will be several problem sets to do over the course of the term. [More info on assignment standards](#).

- **Observing Project:**
  - Optional (see grading schemes below).

- **Observing the Night Sky:**
  - I will arrange for observing sessions using the telescopes on the roof of the Physics building. At present, it is intended that these sessions will be optional. Note that there are also public observing nights.

### Grading scheme

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<tr>
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<th>Scheme 1</th>
<th>Scheme 2</th>
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<tbody>
<tr>
<td>Clicker/in class</td>
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<tr>
<td>Online quizzes</td>
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<td>Assignments</td>
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<tr>
<td>Observing Project</td>
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<td>15</td>
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<tr>
<td>Midterm</td>
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<td>Final</td>
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- **Late submission:** Penalty for assignments up to 1 day late: 25% of the maximum possible grade. No credit for assignments later than a day.

- **Missed assignments, midterms or exams:** Bring Verification of Illness Forms (VIF) within 48 hours of the end of illness to Science Undergraduate Office (SUO) for verification and filing. The SUO will then notify me automatically.

- **Assignments will be returned in class.** Assignments not picked up in class will be left for collection outside PHY 252 for two weeks. If you do not wish your uncollected assignment(s) left for collection, please contact me in advance.
ACADEMIC INTEGRITY:

- **Academic Integrity**: In order to maintain a culture of academic integrity, members of the University of Waterloo community are expected to promote honesty, trust, fairness, respect and responsibility. The Office of Academic Integrity provides relevant information for students, faculty and staff. Students are expected to know what constitutes academic integrity, to avoid committing academic offences, and to take responsibility for their actions. Completion of the Orientation to Academic Integrity Tutorial is encouraged and familiarity with Policy #71, (Student Discipline) is expected. Students who are unsure whether an action constitutes an offence, or need help in learning how to avoid offences (e.g., plagiarism, cheating) or understand ‘rules’ for group work/collaboration should seek guidance from their course instructor, academic advisor, or the Associate Dean of Science for Undergraduate Studies. For information on typical Policy 71 penalties, students should check Guidelines for the Assessment of Penalties.

- **Grievance**: Students, who believe that a decision affecting some aspect of their university life has been unfair or unreasonable, may have grounds for initiating a grievance. Students should read Policy #70, Student Petitions and Grievances, Section 4. When in doubt, students must contact the departmental/school administrative assistant who will provide further assistance.

- **Appeals**: A decision or penalty imposed under Policy 33 (Ethical Behavior), grievances under Policy #70 (Student Petitions and Grievances) or Policy #71 (Student Discipline) may be appealed, if there is a ground. Petitions may not be appealed. Students who believe they have a ground for an appeal should refer to Policy #72 (Student Appeals).

COURSE RULES/CONSIDERATIONS:

- **Exam Period Travel**:
  - The exam period is April 8 through April 23. The exact SCI238 exam date will be announced in mid-February.
  - Note that student travel plans are not considered acceptable grounds for granting an alternative examination time.

- **Students with Disabilities**:
  - AccessAbility Services, located in Needles Hall, Room 1132, collaborates with all academic departments to arrange appropriate accommodations for students with disabilities without compromising the academic integrity of the curriculum. If students require academic accommodations to lessen the impact of their disability, they should register with AccessAbility Services at the beginning of each academic term.

- **Changes to Course Outlines**:
  - Revised course outlines will be posted/provided, if course details change (e.g., topics covered, emphasis on certain topics, etc.)
  - Course elements that will not change are the:
    - Grading schemes
    - Course elements related to evaluation