AST 105: Introduction to the Solar System

Syllabus

Fall 2015

Lecture: Tuesdays and Thursdays, 10:00 AM - 11:20 PM Room: Javits 101

Instructor: Prof. Fred Walter (ESS 459; 632-8232; frederick.walter at stonybrook.edu)
Office Hours: MWF 9-10, or by appointment

TA: DW Han (Dongwan.Han at stonybrook.edu)
Office Hours: TBD

Syllabus revised 12 August 2015

Lecture Schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topics</th>
<th>Reading</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Aug 25</td>
<td>Introduction; Scales of Space and Time; The sky</td>
<td>B 1, 2, S1</td>
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<td></td>
<td>Aug 27</td>
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<td>2</td>
<td>Sep 1</td>
<td>The Beginnings of Astronomy Physics I: the Universe in Motion</td>
<td>B 3</td>
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<td></td>
<td>Sep 3</td>
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<td>B 4</td>
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<td>3</td>
<td>Sep 10</td>
<td>Physics II: Matter and Light</td>
<td>B 5</td>
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<td>4</td>
<td>Sep 15</td>
<td>My, what big eyes you have! Overview of the Solar System</td>
<td>B 6</td>
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<td></td>
<td>Sep 17</td>
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<td>B 7</td>
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<tr>
<td>5</td>
<td>Sep 22</td>
<td>The Sun</td>
<td>B 14</td>
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<td>5</td>
<td>Sep 24</td>
<td>Midterm 1</td>
<td>B 1 - 7</td>
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<td>6</td>
<td>Sep 29</td>
<td>Formation of the Solar System</td>
<td>B 8</td>
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<td>Oct 1</td>
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<td>7</td>
<td>Oct 6</td>
<td>The Earth</td>
<td>B 9</td>
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<td>Oct 8</td>
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<td>8</td>
<td>Oct 13</td>
<td>Terrestrial Planets</td>
<td>B 10</td>
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<td></td>
<td>Oct 15</td>
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<td>Week</td>
<td>Dates</td>
<td>Barsoom</td>
<td>B 10</td>
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<td>9</td>
<td>Oct 20</td>
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<tr>
<td>9</td>
<td>Oct 22</td>
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<td>B 8 – 10, 14 (plus 1-7)</td>
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<td>10</td>
<td>Oct 27</td>
<td>Midterm 2</td>
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<td>Oct 29</td>
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<td>B 11</td>
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<td>11</td>
<td>Nov 3</td>
<td>Jovian Planets</td>
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<td>Nov 5</td>
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<td>B 11</td>
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<td>12</td>
<td>Nov 10</td>
<td>Asteroids</td>
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<td>Nov 12</td>
<td>The Icy Moons</td>
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<td>Pluto</td>
<td>B 12</td>
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<td>B 12</td>
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<td>13</td>
<td>Nov 17</td>
<td>Exoplanets</td>
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<td>Nov 19</td>
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<td>B 13</td>
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<td>14</td>
<td>Nov 24</td>
<td>Exoplanets</td>
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<td>B 13</td>
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<td>15</td>
<td>Dec 1</td>
<td>Life in the Universe</td>
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<td>Dec 3</td>
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<td>B 24</td>
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<td>Final Exam</td>
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<td></td>
<td>Dec 11</td>
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<td>B 1-14, 24, S1</td>
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*** note: this plan is subject to change ***

**Readings**

Readings from the [textbook](#) should be done **BEFORE** the lecture. That way the lecture can be used to clarify, and not just introduce, concepts.

**B** refers to chapters in Bennett's *The Cosmic Perspective*.

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AST 105: General Information
Fall 2015
TuTh 10:00 - 11:20
Javits 101

Instructor: Prof. Frederick M. Walter (ESS 459; 632-8232; frederick.walter at stonybrook.edu).
Office Hours: most Mondays, Wednesdays and Fridays 9:00-10:00; or by appointment.

Teaching Assistant: DW Han (dongwan.han at stonybrook.edu). Office Hours: TBD

Astronomy 105 is an introduction to the solar system for non-science majors. We will cover the
major aspects of modern astronomy and astrophysics relevant to planetary science, the Sun and
its effects on the Earth, astrobiology, and other solar systems. An emphasis will be placed how
the astronomer deduces the physical nature of the constituent parts of the solar system from
observations, rather than from theory.

Prerequisites: None. This course is designed for the student with little or no training in science.
We will use some mathematical reasoning, using algebra and trigonometry, and will introduce
physical principles as they are needed.

Expectations: This is a rigorous science course at the college level. Students are expected to do
all assigned readings prior to lecture, and to participate in class. Students should expect to spend
6-9 hours per week outside of class reading the material and doing the homework. Astronomy is
a quantitative science; students in this course will be expected to be able to solve problems and
answer quantitative questions.

Learning Objectives: Mastery of this course does not mean remembering facts. It means
knowing how to think scientifically. A student who masters Astronomy will be able to think
critically about data (observations), and synthesize disparate facts to reach a conclusion in almost
any area where the data can be quantified. More specifics can be found here.

If passed, this course satisfies DEC E or SBC "study the natural world" requirements.

Course Description: This is a lecture course.

Although we will use the text, we will not follow it exactly. Students are strongly urged to attend
the lectures. Astronomy is advancing far more rapidly than any printed text can keep up with,
and we will use the latest results from the Hubble Space Telescope and various planetary science
missions (including the New Horizons mission to Pluto) in this class. Students are responsible
for all the material presented in lecture and in the assigned readings. Lecture synopses will be
posted on this site, but these are not lecture notes, and do not substitute for the assigned readings.

Observing Sessions: We will have occasional optional observing sessions using the 14"
telescope on the roof of the ESS building. Observing sessions will be announced in class
and here.
Other sources of information Students are encouraged to use the world-wide-web to explore topics covered in this course, but the web must be explored with caution. I've compiled a list of some reputable astronomical web sites here.

Textbook: The Cosmic Perspective: The Solar System by J. Bennett, M. Donahue, N. Schneider, and M. Voit, published by Addison Wesley Pearson. This book is required. The current edition is the Seventh; you may use earlier editions, with the understanding that astronomy is advancing rapidly, and the most recent results will not be in the older editions.

You may also use the full length version, The Cosmic Perspective, which includes additional chapters on stars, galaxies, and cosmology. Note: older editions of the text may different chapter enumeration, and may have different questions numbers too. You are responsible for the material as assigned in the current edition.

Grading: Grades will be based on:

- Two midterm examinations. Midterms will be given in class on Thursday September 24 and Thursday October 22. The midterms are each worth 20% of your grade.
- A cumulative final examination, worth 20% of your grade. The final will be on Friday December 11 from 11:15 AM to 1:45 PM.
- Quizzes. There will about 10 quizzes, one per week, except for the weeks of the midterm examinations and the last week. The lowest two quiz grades will be dropped. The quizzes will account for 10% of your grade. Quizzes will be based on the lecture material and the assigned readings for that week, including assigned homework problems.
- Practical observing activities will account for 20% of your grade. These are due in class on November 10 (part I) and December 1 (parts II and III); activities handed in late will not be graded.
- An investigation of the role of Astronomy in culture, worth 10% of your grade. This project is due in class on Tuesday November 24.

The test and quiz scores (70% of your grade) will be curved such that the top grade is 100% and the median is the greater of 70% or the actual grade. The 30% of your grade that comes from the observational activities and role of Astronomy in Culture essay is not curved. The raw and curved grades will be available on the web.

Lecture Decorum:
Students attending lectures are asked to exhibit common courtesy.

- If you arrive early, please take a seat near the center of the lecture hall. Otherwise late-coming students will be forced to crawl over you.
- Please do not arrive late. This is discourteous and disruptive, and you may miss important announcements.
- Please do not leave early. This is discourteous and disruptive.
- Please do not carry on conversations with your friends during lecture.
• Please turn off cell phones and pagers during lecture. If you must use the phone, please leave the room.
• Students who are disruptive will be asked to leave.

Students are encouraged to ask questions at any time during the lectures. Lecture notes will not be available, although lecture synopses may be posted to the course website. You are responsible for taking notes.

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**Attendance Policy:**

Students who know in advance that they will miss a class or a test because of university-related activities (including athletics) or civic obligations (e.g., jury duty) should contact the instructor as soon as possible in advance of the date of absence. Students so-engaged, who inform the instructor in advance, will not be penalized, and will be allowed to make up any work missed.

If you choose to miss a test for personal reasons you will not be allowed to make it up.

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**Testing Policy:**

Testing is an important way of assessing whether or not you are learning anything from this class. The exams are cumulative. All exams are closed-book. However, each student is allowed to bring one sheet of paper, no larger than 8 1/2 x 11 inches in size, containing whatever information the student deems useful, to the exams.

During an examination:

• All books and other material, except the one crib sheet described above, must be placed under your seat.
• No one is allowed to wear a cap with a bill.
• Sunglasses are not allowed.
• Headphones are not allowed.
• No electronic devices are allowed, including calculators, cell phones, and pagers.
• For your protection, do not sit near your friends during exams. Try to avoid even the appearance of impropriety.

No electronic devices of any kind are allowed during examinations. Cell phones and pagers must be turned off. Students who disrupt the examination because of an audible phone or pager, or by answering a call, will be asked to leave and will have their exam confiscated. Students who may have a legitimate need to be on-call during an examination should discuss this with the instructor in advance.

Students are responsible for coming to the tests prepared. The instructor does not supply pens, pencils or answers. Tests should be completed in pen (any color except red).
Attendance policy for midterms and final: Students will not be permitted to leave for the first 30 minutes (midterms) or the first hour (final). No students will be admitted after anyone leaves. Students should have a picture ID to present upon handing in their exams.

Students who leave a test or exam for whatever reason will not be allowed to return.

Makeup Policy: Midterm and final examinations may be made up only with a valid medical excuse and a doctor's note attesting that the student could not take the exam (a note merely showing a visit to the doctor's is not acceptable). Students seeking a makeup must contact the instructor as soon as possible.

Make-up policy for quizzes: In general quizzes cannot be made up, because the lowest two quizzes are dropped. Students who must miss quizzes because of documented university-related activities or civic obligations will be accommodated.

Requests for extra credit assignments will not be entertained.

Homework: Homework problems will be assigned weekly, but will be neither collected nor graded. Students will be responsible for the assigned homework on quizzes and tests.

Academic Dishonesty:

Students suspected of cheating in exams, of plagiarizing their writing assignments, or of any other form of academic dishonesty, will be assigned an F grade for the course and will be reported to the academic judiciary.

Students who suspect others of cheating are encouraged to report them. Reports will be kept confidential. Dishonest students make things that much harder for the majority of students, who are honest.

Americans with Disability Act:

If you have a physical, psychological, medical, or learning disability that may impact on your ability to carry out assigned course work, the university urges that you contact the staff in the Disabled Student Services (DSS) office, Room 133 Humanities, 632-6748/TDD. DSS will review your concerns and determine, with you, what accommodations are necessary and appropriate. All information and documentation of disability is confidential.