Teaching Staff

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<tr>
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<th>Instructor</th>
<th>Teaching Assistant</th>
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<tbody>
<tr>
<td>Name</td>
<td>Prof. Tony Wong</td>
<td>Mr. Aaron Miguel Holgado</td>
</tr>
<tr>
<td>Office</td>
<td>227 Astronomy</td>
<td>133 Astronomy</td>
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<tr>
<td>Phone</td>
<td>244-4207</td>
<td>333-3090</td>
</tr>
<tr>
<td>Office Hours</td>
<td>Tue 2-3, Thu 3:30-4:30</td>
<td>Mon 10-11, Tue 11-12</td>
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Class Schedule (subject to change)

Course Information

Credit: 3 credit hours.

Prerequisites: Credit in PHYS 212 (University Physics: E&M). Credit or concurrent registration in PHYS 213 (Thermal Physics) and 214 (Quantum Physics) is strongly recommended. Some prior knowledge of astronomy is assumed.

Course Web Page: Located on https://learn.illinois.edu/ (College of LAS Moodle)

Course Goals

Astronomy 405 is an in-depth survey of the Solar System and the interstellar medium. We will review our current knowledge of our planetary system (and how it was obtained), studies of extrasolar planetary systems, and observations and theory of the gas and dust between the stars. Topics include: solar system dynamics; planetary atmospheres, surfaces, and interiors; characterization of extrasolar planets; star and planet formation; components of the ISM; ionization and recombination; heating and cooling processes; and characteristics of interstellar dust. ASTR 405 is intended for advanced undergraduates with an interest in astronomy and a strong background in physics; it is also suitable for beginning graduate students. The course is highly quantitative, and is intended to provide a flavor of where the current research frontiers in these subjects lie. Upon completion of this course, students should be ready to undertake graduate-level research and coursework in these subjects.

Textbooks

Highly Recommended Texts (first two are available at bookstore and on reserve at Grainger Library):
  **Textbook website**
  This new textbook covers planetary science at an advanced undergraduate level. An e-book version is also available from the website above. Free access to the e-book is available through the University Library [at this URL](#).

  **Textbook website**
  A graduate-level textbook with good coverage of spectral line astrophysics. You can lease the e-book for $40 at [this URL](#).

- **Interstellar and Intergalactic Medium** by Barbara Ryden & Richard Pogge (2015).
  This digital textbook is an excellent companion for this class and only $10. Unfortunately, it is only available on Apple devices.

Additional book excerpts or articles from the scientific literature will be assigned, particularly for the ISM topics. These will be available for download from the Moodle website.

**Supplementary Readings (also on reserve at Grainger Library):**

  A graduate-level textbook with particular strength in PAH's and PDR's.

  This huge text provides a broad survey of astrophysics, although with relatively poor coverage of the interstellar medium. Still, it is an important reference book for all of the 400-level astronomy courses.

**Grading**

<table>
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<th>Component</th>
<th>Points</th>
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<tbody>
<tr>
<td>Homeworks (best 11 of 12)</td>
<td>330 (30 pts each)</td>
</tr>
<tr>
<td>Online Quizzes (best 12 of 13)</td>
<td>120 (10 pts each)</td>
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<tr>
<td>Clicker Score</td>
<td>50</td>
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<tr>
<td>Midterm Hour Exam</td>
<td>200</td>
</tr>
<tr>
<td>Final Exam</td>
<td>300</td>
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<tr>
<td><strong>Total Points</strong></td>
<td><strong>1000</strong></td>
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There are 42 lectures in total, and you must attend 40 of these to get full clicker points (unless otherwise announced). For excused absences the clicker score may be pro-rated. For a typical lecture you will receive 1.5 clicker points for responding to >75% of the questions and an additional 1 point for providing a correct response to at least one of the questions. The total clicker score (40*2.5) will then be halved to give a point score out of 50.

The course point total will be converted to a percentage, with A's corresponding to 90-100%, B's corresponding to 80-89%, C's corresponding to 70-79%, and D's corresponding to 60-69%. Pluses and
minuses will be used.

Assignments

Regular assignments are an important part of the course, helping to reinforce concepts covered in the lectures and textbook.

1. **Homework assignments** (accessed through the course web page). These will consist of about 4-5 problems each, and are due in class on Wednesdays. Handwritten solutions are acceptable, but should be legible. Occasionally exercises will need to be completed on a computer. Credit will only be given to well-explained answers, and all important steps in a calculation must be shown.

2. **Keep a copy of your work.** You are strongly urged to make a scan or photocopy of anything you hand in (or keep a copy of any electronic file). This is to protect you in case a situation arises in which there is disagreement about whether or not an assignment has been submitted.

3. **Online Quizzes.** These will be short writing exercises to be completed online before each Monday's lecture. You will be asked to explain or summarize a topic from the readings and/or lectures, and comment on which topics you found confusing. You should finish the quiz by midnight before class so the instructor is able to review the responses before class.

Rules of Etiquette

For the benefit of your fellow students and your instructor, you are expected to follow these basic rules of decorum.

- Show up for class on time. If you must be late on a regular basis, please inform the instructor.
- Silence your cell phone before class begins.
- Computing devices can only be used in class under special circumstances or with the instructor's permission. These can distract you or others.
- Do not leave class early, and do not rustle papers or pack up bags in preparation for leaving before class time is up.
- Be attentive in class. Do not use headphones, read newspapers, or prop your feet up on other chairs or desks.
- Be respectful in your interactions with your fellow students and your teachers, whether in person or in cyberspace.

Class Policies

- **General:** This course will follow all policies in the *Student Code* ([http://studentcode.illinois.edu](http://studentcode.illinois.edu)).

- **Class Participation:** Regular attendance is important, and there will be frequent i-clicker questions and in-class exercises to test your knowledge and prepare for upcoming homeworks. If you miss too many classes your grade will begin to suffer. You are also encouraged to volunteer or ask questions in class and come to office hours; this is a good way to develop familiarity with the instructor (which might come in handy if you choose to apply for graduate school...).

- **Working With Others:** Discussing course material with your classmates is encouraged, but each student is expected to do his or her own work. You are allowed to work together on homework...
problems, but each student should write up an individual description of the solution. Some activities may allow you to work together in gathering data. Each student who participated in a joint measurement may make use of that jointly acquired data, but each student should prepare an individual report. If you are in any doubt about whether something is allowed or not, ask the instructor or TA.

- **Late Assignments:** Assignments have due dates as posted on the course website. Work turned in late will be assessed a 10% penalty per calendar day it is late. For a well-documented excuse (such as illness) the penalty may be waived at the instructor's discretion. No work will be accepted more than a week after the due date, regardless of medical excuse, since solutions will be released. In general, late assignments can only be submitted during official class meeting times, posted office hours, or by e-mail to the TA. Department mailboxes are not secure and should NOT be used.

- **Make-up exams** will be offered in well-justified circumstances, in accordance with sections 1-501, 1-502, and 3-201 of the *Student Code*. Advance notice is **required** for approved school events (e.g., athletic events), religious observances, and other planned absences. Sudden illness requires documentation from McKinley Health Center or the Emergency Dean. The Emergency Dean must be contacted in other cases of unforeseen circumstances (e.g., death in the family). The format of the make-up may differ from the standard exam. In all cases, the make-up will be scheduled *after* the main exam.

- **Special accommodations:** To insure that concerns are properly addressed from the beginning, students who require reasonable accommodations to participate in this class are asked to see the instructor as soon as possible. All accommodations will follow the procedures as stated in sections 1-107 and 1-110 of the *Student Code*.

- **Academic Integrity:** Any instance of academic dishonesty (including cheating and plagiarism) will result in a grade of 0 for that component and be documented in the student's academic file. This includes copying written material from the Internet without proper attribution. Please refer to sections 1-401 to 1-406 of the *Student Code*.

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This page last updated 15 Jan 2016