Astronomy 210 Syllabus
Spring 2015 Section 1

About this course

Astronomy 210 is a one-semester introduction to astronomy and astrophysics. We will learn about the development of astronomy, the quest for understanding the universe in terms of physical laws, and where the limits of our knowledge currently are. We will begin by studying the basic components of our galaxy — planets, stars, and interstellar gas — then move on to talk about the galaxies themselves, and then the Universe as a whole. We will learn about such diverse phenomena as neutron stars, black holes, and dark energy, and try to develop some intuitive understanding of them.

Unlike “Astronomy 101,” this is a class which emphasizes quantitative calculation. We will frequently use mathematics to describe what we’re seeing. This enables us to make detailed predictions, essential for the practice of science. Our goal is not just to observe and learn about what scientists do; it is place ourselves squarely in their shoes. Much of the required physics will be reviewed, but students are expected to have completed the first semester of university physics (Mechanics) and be taking or have completed the second semester (Electricity & Magnetism). If you plan to take higher level (400 series) astronomy courses, this should be your first course in astronomy. Regardless of whether or not you pursue a career in science, you should come away with an appreciation of how science, though never immune to the human failings of its practitioners, can be a self-correcting enterprise.

Instructors

**Professor**  
Paul Ricker

**Office**  
201 Astronomy

**Hours**  
Wed 2-4

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132 Astronomy

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The course Moodle web site, https://learn.illinois.edu/course/view.php?id=9890, will be used for all class assignments and announcements. You should be enrolled automatically in the course on Moodle if you have registered for it. If you are not automatically enrolled, please speak with the instructor.

**Textbook**

The textbook for this course is Ryden and Peterson, *Foundations of Astrophysics* (ISBN-10: 0321595580). This book has been placed on reserve in Grainger Engineering Library.

**Evaluation**

Evaluation of assignments and exams will be done on a point system as follows. Scores are tabulated to the nearest point.

<table>
<thead>
<tr>
<th>Total</th>
<th>1000 points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homework (best 10 of 11)</td>
<td>10 x 50 points each = 500 points</td>
</tr>
<tr>
<td>Computational project</td>
<td>50 points</td>
</tr>
<tr>
<td>Observational project</td>
<td>50 points</td>
</tr>
<tr>
<td>iClicker/class participation</td>
<td>50 points</td>
</tr>
<tr>
<td>Midterm exams</td>
<td>2 x 100 points each = 200 points</td>
</tr>
<tr>
<td>Final exam</td>
<td>150 points</td>
</tr>
</tbody>
</table>

Letter grades will be assigned only for the final course grade using the following scale. Ranges indicate total points for each grade.
<table>
<thead>
<tr>
<th>Letter grade</th>
<th>Point range</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>900 - 1000</td>
</tr>
<tr>
<td>B</td>
<td>800 - 899</td>
</tr>
<tr>
<td>C</td>
<td>700 - 799</td>
</tr>
<tr>
<td>D</td>
<td>600 - 699</td>
</tr>
<tr>
<td>F</td>
<td>0 - 599</td>
</tr>
</tbody>
</table>

Plus and minus grades will be given. The lower limit for each grade interval is subject to downward adjustment for the class if, in the instructor's judgment, the difficulty of the course work was too high. However, lower limits for each interval will not be increased.

**Homework**

Eleven homework assignments will be posted and submitted via the course web site. They will be due online by 5:00 pm on the due dates specified in the schedule. **Late assignments will be penalized 10 points per day** (and thus will not be accepted after 5:00 pm five days after the due date). Homework submission time will be determined by the course web server's clock. To avoid misunderstandings due to differences in clocks, you should not wait until the last minute to submit your homework. **Your lowest score will be dropped from your final grade.**

Homework assignments can be uploaded to the course web site in any of several different formats. Portable Document Format (PDF) is **greatly preferred**; however, we can also deal with plain text, HTML, Postscript, Microsoft Word or Powerpoint, and OpenOffice/LibreOffice formats. Other formats will not be accepted. If you prefer to write out your assignments longhand, you may submit them in this form provided that you scan them into one of the accepted formats (most scanners come with programs that make this relatively painless). Smartphone software such as CamScanner (for Android [https://play.google.com/store/apps/details?id=com.intsig.camscanner]) or Windows Phone (http://www.windowsphone.com/en-
Computational project

Computers are essential tools for modern astrophysics, and you will undertake a project that requires data analysis on a computer. The computational project will explore class topics in greater depth and make use of the same data that astronomers typically obtain. You will have the choice of completing either a simulation project (which requires programming) or a data analysis project (which does not). Projects will be submitted via the course website and are subject to the same late policy as for homeworks.

Observational project

The observing project is a night-time telescope viewing session at the Campus Observatory (https://maps.google.com/maps?q=to:901+South+Mathews+Avenue+Urbana+IL&ll=40.105269,-88.2260). The list of possible dates will be announced a few weeks in advance. You will make sketches of your observations and complete a short writeup on the activity, to be submitted via the course website and subject to the same late policy as for homeworks. Since the weather is unpredictable, and some sessions may be clouded out, try to attend one of the earlier sessions.

iClicker

Each student should bring their own iClicker (http://www.iclicker.com) personal response device to lecture. This can be purchased from campus bookstores (either the original iClicker or the 2nd generation version are fine). You will use the iClicker to answer multiple-choice questions posed by the instructor during class. Each class will include several such questions, some of which will have a "correct" answer and some of which will be more of a survey nature. Full credit will be given for correct answers or responses to survey questions, and half credit will be given for incorrect answers. Answers that are none of the choices given will receive zero credit. Each class meeting's iClicker credit will be scaled to the range 0 to 2 points. We will start tallying
iClicker scores with the February 2 class. If you occasionally forget to bring your iClicker, don't worry; only the top 25 (out of the last 36) sessions are included in the final course grade.

You are responsible for ensuring that your iClicker points are properly credited in the Moodle gradebook. If you believe that you have not received proper credit for your iClicker responses, you must send an email detailing your situation to the TA within 48 hours of the time the grades are posted. No adjustments will be made to iClicker grades after 48 hours.

In order to receive credit for your iClicker responses, you must register your iClicker, even if you have done so in a prior semester. You must have come to class at least once and voted on at least one question in order to complete this registration properly. Once you have responded to a question with your iClicke, visit the course Moodle page and click on the "iClicker Registration" link. Enter your iClicker remote ID in the required field and click Submit.

If you lose or break your iClicker, you will need to purchase another one. If this happens, please email the instructor with your new remote ID so that he can manually register your new iClicker.

If you have questions about iClickers, please visit www.iclicker.com (http://www.iclicker.com) or ask the instructor or TA.

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**Exams**

Two in-class midterms will be given. Each will cover new material up through the Friday class prior to each exam date (see schedule for dates). A comprehensive final exam (https://learn.illinois.edu/mod/assign/view.php?id=828198) will be given Tuesday, May 12 from 7:00 - 10:00 pm in the class meeting room.

Make-up exams will be offered in well-justified circumstances, in accordance with sections 1-501 (http://admin.illinois.edu/policy/code/article1_part5_1-501.html), 1-502 (http://admin.illinois.edu/policy/code/article1_part5_1-502.html), and 3-201 (http://admin.illinois.edu/policy/code/article3_part2_3-201.html) of the Student Code (http://admin.illinois.edu/policy/code/index.html). 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.

**Attendance**

You are expected to attend class regularly. The lectures will include
material that is not in the textbook, and this supplementary material will be
included in homework assignments and exams. Class participation is a part
of your final grade and is measured using your iClicker responses.

**Honesty**

Academic integrity lies at the core of the University's education and
research missions; accordingly, you are expected to internalize the spirit as
well as the letter of the University's rules on academic integrity
(http://www.library.illinois.edu/learn/research/academicintegrity.html).
Infractions of these rules — including but not limited to cheating,
plagiarism, falsification of data, and grade alteration — will be penalized as
provided for by Article 1, Part 4 (http://admin.illinois.edu/policy/code/article1_part4_1-401.html) of the
*Student Code* (http://admin.illinois.edu/policy/code/index.html). Bringing
a fellow student's iClicker to class or having another student bring your
iClicker to class and respond on your behalf is cheating and will be dealt
with accordingly.

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.

**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.
• Turn off or silence your cell phone before class begins.
• Laptops are not permitted. You may use a tablet to take notes only. If there are abuses of this policy, tablets may be banned also.
• Do not leave class early, and do not rustle papers or pack up bags in preparation for leaving before class is dismissed.
• 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.

Accessibility statement

To insure that disability-related concerns are properly addressed from the beginning, students with disabilities 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 given in sections 1-107 (http://admin.illinois.edu/policy/code/article1_part1_1-107.html) and 1-110 (http://admin.illinois.edu/policy/code/article1_part1_1-110.html) of the Student Code (http://admin.illinois.edu/policy/code/index.html).