

Syllabus for Astronomy 127: Naked-Eye Astronomy — University of Michigan

Semester: Fall 2016 (second 7 weeks)

Section: Astro 127.004 (lecture)

Dates: October 24, 2016, through December 12, 2016

Times: Monday and Wednesday, 2:00-3:00 PM (lecture begins at 2:10 PM)

Location: Angell Hall Planetarium, room 3118 (Angell Hall is located at 435 S. State St.)

Credit: 1 credit (has *NS* and *BS* designations)

Prerequisites: None

Instructor: Dr. Ian U. Roederer

Email: iur@umich.edu

Phone: 734-615-7374

Office: West Hall 306D (West Hall is located at 1085 S. University Ave.)

Office hours: Tuesday 2:00-3:30 PM, Wednesday 9:15-10:30 AM, or by appointment

Required text: *National Audubon Society Field Guide to the Night Sky* by M. Chartrand. Alfred A. Knopf, any edition. ISBN-13: 978-0-679-40852-9. (The text has changed little, and page numbers have not changed at all, so any edition from 1991 to 2013 is fine.) A copy of this book is kept on reserve in the Shapiro Undergraduate Library.

Optional item: a red flashlight, red filter for a flashlight, or even a red bicycle light. You may find this helpful when reading instructions or star charts at night. (A red filter for a smart phone screen is better than nothing, but the red light emitted by your phone does include traces of other colors of the spectrum that can negatively affect your night vision.)

Basic philosophy of this class: Astronomy is one of the oldest activities known to civilization. When you look at the night sky, you—*you!*—participate in a tradition that spans uncounted generations across continents and millennia. This course will help you develop the skills and experience to join that tradition, assign a physical understanding to your observations, and equip you with the language to communicate with stargazers around the globe.

Learning objectives: By the end of the course, you should be able to

- (1) name and identify the brightest planets, stars, and constellations visible from the northern hemisphere;
- (2) recognize and name the phases of the Moon and predict its location in the sky for a given time and phase;
- (3) discuss the relationships between Earth and other astronomical objects responsible for the apparent motion of the sky and the objects and phenomena observed there;
- (4) predict how the night sky changes over the course of the night and over the course of the year; and
- (5) assess the impact of humans on the appearance of the sky and the objects observed there.

Astronomy 127 schedule (subject to change)

Class	Date	Topic	Reading to have completed before class today	Handouts, Assignments, Etc.
1	Monday, October 24	Introduction		Syllabus distributed. Observation #1 assigned.
2	Wednesday, October 26	In-class practice observing session	Course syllabus Dickinson-darkadapt.pdf (Canvas) FGNS, 89-96	Observations #2 to #5 assigned. Download and begin playing with a copy of the Stellarium software (www.stellarium.org).
3	Monday, October 31	The Earth-Sun system	Observing assignment instructions Dickinson-distance.pdf (Canvas) Dickinson-ecliptic.pdf (Canvas) FGNS, 47-51	
4	Wednesday, November 2	Celestial motions	FGNS, 59-72	Observation #1 due. Sign up for a time slot for the oral exams.
5	Monday, November 7	Seasonal stars	Peterson-constellations.pdf (Canvas) FGNS, 73-80, 405-408	
6	Wednesday, November 9	Planets	FGNS, 641-669	
7	Monday, November 14	The Moon, part 1	FGNS, 55-58, 625-640	Observation #2 due.
8	Wednesday, November 16	The Moon, part 2		
9	Monday, November 21	Is it a UFO?	Dickinson-satellites.pdf (Canvas) FGNS, 630-631, 669-680	
10	Wednesday, November 23	OPTIONAL CLASS: practice observing session		
11	Monday, November 28	Who owns the asteroids?	SpaceMining.pdf (Canvas)	
12	Wednesday, November 30	Stars	Dickinson-names.pdf (Canvas) Peterson-magnitudes.pdf (Canvas) FGNS, 19-34	
13	Monday, December 5	Light pollution	LightPollution.pdf (Canvas)	Observations #3, #4, #5 due.
14	Wednesday, December 7	NO CLASS		Oral exams take place on other days this week.
15	Monday, December 12	The Milky Way and deep space	Dickinson-milkyway.pdf (Canvas) Peterson-milkyway.pdf (Canvas) FGNS, 13-19, 427-428	

FGNS = *National Audubon Society Field Guide to the Night Sky*.

All other items in the reading list are posted in the “Files > Readings” tabs on the Canvas site; most are not more than a few pages long.

Credit: This is a half-term mini-course. It counts for one credit hour, but remember that this one credit is averaged over the entire semester (including the part of the term that you're *not* in this course). For the half-term you are here, this course is effectively a two-credit course. I will expect a commensurate level of out-of-class effort (i.e., up to 4 hours per week) on your part.

Drop/add: This is a half-term class, so the LSA rules stipulate that only the first *two* weeks of the course qualify for the “free” drop/add period. November 7 is the official drop/add deadline.

Attendance and in-class writing summaries: I will follow the established LSA attendance policy (<http://lsa.umich.edu/lsa/academics/degrees-requirements/academic-policies/class-attendance.html>) regarding religious holidays, illnesses, representation of the University, etc. Other personal reasons not covered explicitly by this policy should be discussed with me well in advance (two weeks or more) of the absence. Documentation (e.g., doctor's note from U.H.S.) may be requested in accordance with this policy to count as an excused absence.

We will use the unique projection capabilities of this planetarium on a daily basis, and your participation in class discussions and activities provides an opportunity to engage with the material that cannot be duplicated out of class time. A total of 16.5% of your final grade will be based on short in-class writing summaries that will be completed during the last five minutes of each class period (except Oct. 24 and Nov. 23). I will post a couple of questions or prompts and ask you to respond to these, but I will only check for completeness. Each day's in-class writing summary is worth 1.5 points, and you need to submit 11 of these over the course of the term to receive full credit.

Night-sky observations: Your assignments will consist of making observations of celestial objects outside of class time. The goal of these assignments is to guide you in making observations of the night sky. Past experience shows that these assignments provide a reasonable assessment of students' abilities to navigate the night sky (learning objectives 1 and 2).

Detailed instructions for these assignments will be provided elsewhere. Collaboration with classmates is allowed and even encouraged, including collaborations with students enrolled in other sections of Astro 127, but each student must complete and submit a log of observations to receive credit. The average fraction of nights that are cloudy increases during the fall in Michigan. I advise you not to procrastinate. Be vigilant about the weather and be ready to make an observation at a moment's notice if the sky is mostly clear. *Poor weather will not be accepted as an excuse for not completing these assignments.*

All assignments must be submitted to me in hard-copy form (i.e., paper) at the beginning of the lecture section on the due date unless approved by me in advance. No late assignments will be accepted without prior approval by me for exceptions as permitted by the LSA's attendance policy. Any assignment may be submitted early. If you wish to contest a grade on an assignment, you must register your intent to contest this grade with me within 72 hours of the assignment being returned to you.

Exam: One oral exam will take place near the end of the seven-week session. (There will be no written exam.) The goal of the exam is to provide an opportunity for you to demonstrate your ability to recognize and identify objects in the sky, explain their motions, and make predictions (learning objectives 1, 2, 3, and 4). Many students who have taken this course in previous years have expressed that one of their main reasons for taking it was to be able to recognize stars, planets, and constellations in the sky, and this kind of exam is really the best way for you to demonstrate that you can do this. The spirit of the exam will be that of a collaborative conversation—my goal is not to try to stump you! You will know exactly the form and content of the exam weeks in advance.

The exam will take place in another building on campus (UM Museum of Natural History, in their planetarium) during normal business hours but outside of the normal 2-3PM MW schedule for this course. You will be able to sign up for a 20-minute time slot that fits your schedule.

Note that there will be no exam during the scheduled exam period for Astro 127.004. After our last class meeting on December 12, you will have completed this course.

Grades: I use high standards to evaluate your work in this course. I do so because I believe that each of you is capable of meeting those standards. Grades will be calculated by summing scores on the five observing assignments (worth 8.5, 10, 10, 10, and 15 points, accounting for 53.5% of the total course grade), in-class writing summaries (11 worth 1.5 points each, accounting for 16.5%), and the oral exam (worth 30 points, accounting for 30%). Grades will be assigned to the point score as follows:

99+: A+	87-90: B+	77-80: C+	67-70: D+	0-60: E
93-99: A	83-87: B	73-77: C	63-67: D	
90-93: A-	80-83: B-	70-73: C-	60-63: D-	

I reserve the right to lower the cutoffs for each letter grade, but I will not raise the cutoff marks (e.g., under no circumstances would 90 points receive a B+ or below).

Extra credit: No extra credit will be allowed. However, you are permitted to erase a low grade on observations #2, 3, 4, and/or 5 by repeating that observation at a later date and submitting it on or before December 5.

Academic integrity: The LSA community, like all communities, functions best when its members treat one another with honesty, fairness, respect, and trust. The “LSA Community Standards of Academic Integrity” statement (<http://www.lsa.umich.edu/academicintegrity>) outlines the principles we will follow in this class, and the “LSA Procedures for Resolving Academic Misconduct” (<http://www.lsa.umich.edu/academicintegrity/procedures>) will be used to resolve any issues that arise. Graded material deemed, after due process, to be plagiarized will receive a zero.

Devices in the classroom: Cell phones and other devices are allowed in my class if they are used responsibly and do not pose a distraction to me, you, or your neighbor. These devices must remain silent. In the interest of common courtesy, if you find yourself in need of your phone

(perhaps in the case of an emergency), please quietly excuse yourself from class and do what you need to do in the hallway. Many of our class activities will involve using a darkened planetarium; the warm, alluring glow of these devices can be an impediment to achieving dark-adapted eyesight by you or your neighbor. During these dark planetarium sessions I will request that phones or other devices be turned off or put away. If these devices become a persistent distraction, I reserve the right to ban them altogether.

Safety: Your education and safety are the highest priorities in this course. Because the planetarium will be dark at times, additional policies are in place to protect your safety here. Please remain seated while the planetarium is in operation. The planetarium is delicate, expensive, and time-consuming to repair. Please do not touch the planetarium equipment. To avoid any costly or embarrassing situations, food, drinks, and smoking are prohibited in the planetarium. This policy is not subject to my discretion. Safety is also a concern for the observing assignments. Be aware of your surroundings, and observe in groups if possible.

Contacting me: Email is the best way to contact me. Please write “Astro 127” in the subject line. Typically I will respond to email only during normal business hours. The phone number given is a desk phone that cannot receive text messages, and it is only answered during normal business hours. As a matter of policy, I decline facebook messages or friend requests from students. I am happy to discuss course material or other matters with you during my office hours, via email, before or after class, or at other times by appointment.

Office hours: Office hours will be held on Tuesdays from 2:00-3:30 PM and Wednesdays from 9:15-10:30 AM, or by appointment. My office is room 306D in West Hall.

Other sections of Astro 127: There are two other sections of Astro 127 running parallel to this one. Those sections are taught independently by a different instructor. Some of the material covered may be similar, but there is no guarantee that the assignments, exams, or grading schemes will be identical. Enrollment in each section of Astro 127 is limited by the number of seats in the Angell Hall Planetarium, so please only attend the section in which you are enrolled.

Practice, practice, practice: In past years, every student who has made a reasonable effort to complete the observing assignments has learned to identify stars, planets, and constellations in the night sky. I am confident that, with practice, each of you can achieve a similar level of comfort and familiarity with the night sky. The course activities are designed to help develop your intuition about models of the systems you are observing. Simply noticing the changes in the sky from night to night and season to season will go a long way. The best advice I can give you is to practice, work together, and try to have fun.



This course is taught by a member of the Lecturers' Employee Organization, AFT Michigan Local 6244, AFL-CIO.