

Astronomy 101
Introductory Astronomy:
The Solar System and the Search for Life Beyond Earth

This course presents an introduction to astronomy and astrophysics with an emphasis on the solar system and the possibility of life beyond Earth. The first third of the course deals with understanding the history of astronomy, orbits, gravitation, optics and the properties of light and matter. The second third of the course investigates the properties, origin, and evolution of the major planets, asteroids, comets, the Sun and other components of the Solar System with particular emphasis on comparative aspects with respect to the Earth. Recent discoveries of extrasolar planets and the intensifying search for life on Mars will be highlighted in the last third of the course when we explore the developing field of Astrobiology, the study of the origins, evolution, distribution, and future of life in the universe. This course is intended for non-science concentrators with a basic high school math and science background. Astronomy 101 has a one hour discussion section every week. Course requirements include assigned reading, section meetings, homework, observations, quizzes, and exams. Telescope viewing is also incorporated into the class.

Locations and Times

Lectures in Room 182 Dennison (DENN); Discussions in 5180B Angell Hall (AH)

Lectures MWF, 1-2 or 2-3 PM; also every student has a discussion section (discussion sections do not meet the first week of classes). Students can attend either lecture section.

Website: <http://ctools.umich.edu>

Books and Materials

A special textbook was compiled for this class and it is available in the bookstores: *Introduction to Astronomy: The Solar System and the Search for Life Beyond Earth* (ISBN0536469962). This is a combination of select chapters from two books: 1) *The Solar System: The Cosmic Perspective, Fourth Edition*; by Bennett, Donahue, Schneider, and Voit; 2) *Life in the Universe, Second Edition*; by Bennett, Shostak, and Jakosky.

Professors

Lee Hartmann	Room 955 Dennison	lhartm@umich.edu	936-7781
Dipankar Maitra	Room 913 Dennison	dmaitra@umich.edu	615-1583

This class will be taught in team format, with the schedule given in the syllabus.

Office hours: Wed, 10 AM - 12 PM, and by appointment.

Phone of main Astronomy office: 764-3440

Grading

Discussion section: 34% of your course grade, including a visit to the Angell Hall Telescope.

Exams: 20% each (3 total, exams are not cumulative)

The last exam will be during finals period (see schedule). There is no cumulative final exam.

Participation: 6% (of this 50% is based on attendance, 50% on answering in-class questions. Both are based on the use of electronic response devices; you can miss up to 6 classes without attendance penalty).

No extra credit.

Observing in Angell Hall and other observatories

All students will be required to attend at least one observing session in Angell Hall or any open house at the Detroit Observatory or elsewhere, using the telescopes to view the sky. Note that this telescope observing assignment is worth 10% of your section grade and it will be important to attend an observing opportunity when there is clear weather. See the ctools site for further details.

Participation

Participation grade is based equally on attending lecture and answering in-class questions. Attendance will be taken in this class through use of the electronic response devices (see “iclicker information” below). As noted in “Grading,” the attendance represents 3% of your final grade and we begin taking attendance on Sep. 12. We allow you to miss up to 6 classes for any reason without penalty, and we will not grant excuses for personal emergencies since they factor into your six allowed absences. During each lecture, there will be a few questions posed that can be answered only through the electronic response devices. Correct answers throughout the semester are worth a cumulative 3% of final grade.

Homework

Homework will be posted on ctools on Fridays and must be handed in at the beginning of class the following Friday (or Monday if no Friday class). **YOU MUST PUT YOUR NAME AND SECTION NUMBER ON YOUR HOMEWORK OR IT MIGHT NOT BE GRADED.** Late homework *will* be accepted but only *before* the start of the following lecture period, with a 25% score penalty.

Chat Rooms

Through Course Tools (<http://ctools.umich.edu>) there will be a dedicated chat room for this class. This will be used for online office hours by the GSIs (see Discussion Section Syllabus for details regarding GSI office hours).

i>clicker Information

This course requires the i>clicker student response device for use in lectures. These are available at the U-M Computer Showcase in the basement of the student union for ~\$33 (used ~\$23). **SAVE YOUR RECEIPT.** Your receipt is required if you decide to sell back your device at the end of this course. **YOU MUST REGISTER YOUR CLICKER ON THE CTOOLS WEBSITE TO HAVE YOUR SCORES RECORDED.** See <http://showcase.its.umich.edu/remotes/> under products for further information.

Academic Integrity

A useful collection of resources on Academic Integrity at the University of Michigan can be found at: <http://www.lib.umich.edu/acadintegrity/>. Any incidents of plagiarism, cheating, or homework copying will be reported to Academic Affairs.

Important Dates

There are no classes on October 15, during fall break, nor on 23 November, Thanksgiving break.

Graduate Student Instructors

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Christina Burns	ceburns@umich.edu
Beth McBride	bethmcbr@umich.edu

Syllabus and Approximate Schedule

The following table contains a detailed syllabus. This schedule is subject to change during the semester – please check CourseTools website (ctools.umich.edu) regularly for updates.

In the table we have used a few abbreviations. For instructors, **LH** = Lee Hartmann, **DM** = Dipankar Maitra. Our “special textbook” consists of sections from two other textbooks. The assigned reading below specifies which section to read. The first part is from “The Solar System: The Cosmic Perspective” (**SS**), and the second part is from “Life in the Universe” (**LU**).

Dates	Instructor	Book Section	Chapter Title
Sep 5	LH,DM	SS	1. Our Place in the Universe
Sep 7	LH	LU	1. A Universe of Life?
Sep 10,12,14	DM	SS	2. Discovering the Universe for Yourself
Sep 14,17,19	DM	SS	3. The Science of Astronomy
Sep 21,24,26	DM	SS	4. Making Sense of the Universe: Motion, Energy, Gravity
Sep 28, Oct 1,3	DM	SS	5. Light and Matter: Reading Messages from the Cosmos
Oct 5 (Fri): EXAM I			
Oct 8,10	DM	SS	7. Our Planetary System
Oct 12,17	LH	SS	8. Formation of the Solar System
<i>Study break Oct. 15</i>			
Oct 19,22	DM	SS	9. Planetary Geology: Earth & the Other Terrestrial Worlds
Oct 24,26	DM	SS	10. Planetary Atmospheres: Earth & the Other Terrestrial Worlds
Oct 29,31	DM	SS	11. Jovian Planet Systems
Nov 2,5	LH	SS	12. Remnants of Rock and Ice: Asteroids, Comets (and Pluto)
Nov 7 (Wed): EXAM II			
Nov 9,12	LH	LU	4. The Habitability of Earth
Nov 14,16	LH	LU	5. The Nature of Life on Earth
Nov 19,21	LH	LU	6. The Origin and Evolution of Life on Earth
<i>Thanksgiving recess</i>			
Nov 26	LH	LU	7. Searching for Life in Our Solar System
Nov 28	LH	LU	8. Mars
Nov 30	LH	LU	9. Life on the Jovian Moons
Dec 3	LH	LU	10. The Nature and Evolution of Habitability
Dec 5,7	LH	LU	11. Habitability Outside the Solar System
Dec 9	LH	LU	Review
EXAM III: Dec. 18 1:30p (2pm lecture); Dec 20 1:30pm (1pm lecture)			