Astronomy 100 Syllabus

Basic Concepts of Astronomy

Fall 2024, M, W, TH, 11:30 AM-12:20 PM

Professor Ying-Chih Chen

Department of Physics and Astronomy

Room, 1238 HN

Office Hours: Monday 12:20-1:30 PM

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3 Credits, 3 Hrs Lecture

Description

This is an introductory, one-semester astronomy course designed for non-science majors. The approach in this course is to emphasize the ideas of Astronomy and a qualitative understanding of the physical processes that shape the Universe. It minimizes the use of mathematics. The course meets three hours per week. This course satisfies the science plus laboratory General Education Requirement.

Textbook **:**
Modified Mastering Astronomy for The Cosmic Perspective, 10th Edition, Pearson Publisher.
Author(s): Bennett, Jeffrey | Donahue, Megan | Schneider, Nicholas | Voit, Mark
Textbook ISBN-13: 9780135328170
See page 7 for registration instructions.

Lecture

- Observational features of the night sky and discussion of the motions of celestial objects observable with the naked eye. The ancient roots of Astronomy, the scientific method, the Copernican revolution, Kepler's laws of planetary motion. Aplications of the fundamental physical laws and their applications to astronomical phenomena.
- Properties of light – the cosmic messenger interaction with and matter, telescopes
- Origin and formation of the Solar System.
- The origin, properties, and evolution of the Sun and other stars, including giants, dwarfs, supernovae, neutron stars, and black holes.
- Star clusters and galaxies, clusters of galaxies. Dark Matter and Dark Energy are discussed. The large scale structure of the Universe concluding with theories of the origin and evolution of the universe or cosmology. Hubble's Law and the expanding universe, from the Big Bang to the present.

Online Assignment

Weekly online homework will be assigned. Every assignment is due by the midterm or final examination day.

Learning Outcomes

After completing this course, students should be able to:

- Describe the various spatial ranges and time scales related to astronomical objects
- Have some understanding of the scientific method and why it is successful
- Perform elementary quantitative and physical reasoning
- Explain the motion of celestial objects and describe properties of astronomical objects.
- Discuss the origin and evolution of astronomical objects and describe the processes using physical laws
- Discuss the current theory of the origin of the universe and possible future evolution

Requirements and Grading

This is a rigorous course that requires continuous participation in lectures and the regular submission of assignment solutions.

Course grade

There are three midterm examinations and a comprehensive final examination.[1,2,3,4,5,6]. All midterms and the final will be closed-book and closed notes.

Midterm 1 (Best midterm)	25%
Midterm 2 (Second best midterm)	15%
Pop Quizzes （discounting lowest two scores）	15 %
Homework	15%
Final Examination	30%
Total	**100%**

The midterm examinations will be held on Monday, September 30, 2024, Wednesday, October 30, 2024 and Monday, December 2, 2024. The Final Examination will be held on Monday, December 16, 2024 from 11:30 am – 1:30 pm.

1) The examination and quiz questions consist of multiple choice and multiple answer questions, and will be conducted in-person through Blackboard. Certain test delivery procedures such as no backtracking may be used.
2) Students are expected to bring their own computers, laptops, or tablets to the class to do the problems on Blackboard in the classroom at assigned seats. Make sure that the computers are fully charged and preferably with a backup battery. Also bring a photo ID. No personal notes are allowed during examinations.
3) The lowest midterm score or a missed midterm will be dropped to accommodate sickness or emergencies including being tested positive for COVID.
4) There will be N pop quizzes. The scores of the best N-3 will be counted.
5) The instructor will make an effort to accommodate any conflicts with religious practices by adjusting the dates for midterm examinations for the entire class. However, it is imperative for students to promptly inform the instructor of such conflicts within a week after the first day of classes. Following this deadline, the examination dates will be finalized, and there will be no provision for makeup exams for midterms missed due to any circumstances.

6) The final letter grade will be based on students' relative standing in the class. Curving may be done for the overall scores if the instructor finds it necessary. No curving will be done for individual tests.

7) There will be NO MAKEUP for any of the quizzes and midterm examinations. If you miss the final exam for a valid reason, e.g. for a serious medical condition and you present a proof of your condition, then, you will receive a grade of incomplete (IN). In this case, to complete your course requirements you must take a written makeup exam on the scheduled makeup exam day in the following semester.

8) Attendance at all lectures is required in this course. The instructor has the right to drop you from a course for excessive absence, and to treat lateness as equivalent to absence. No distinction is made between excused and unexcused absences. A student absent more than 15% of the class hours may be given a WU grade.

The Test Security and Fairness Policies

These policies are crafted to ensure a standardized, impartial, and just environment for all students, preventing any undue advantage during examinations. They align with the standards commonly adopted by major nationwide testing services.

- Bring the following items: your Hunter ID card, and a laptop or tablet computer with a charger or backup battery. Sharing or borrowing these tools during the examination is strictly prohibited.
- Late Arrival: Candidates arriving more than five minutes late may be denied the opportunity to take the test.
- Seat Reassignment: Your instructor may reassign seats as necessary.
- No Communication with neighboring Students: Maintaining silence and refraining from any form of communication with neighboring students during the examination is imperative. Violations may result in expulsion from the examination room and a zero score for the test.
- For online tests conducted through Blackboard, accessing other websites or Apps is strictly forbidden.
- No Restroom Trips: Plan not to use the restroom throughout the entire examination duration. Please use the restroom before the examination begins. If you have a medical need to use the restroom, submit a doctor's note in advance so that special arrangements with a designated proctor can be made for you.

Academic Integrity

Hunter College regards acts of academic dishonesty (e.g., plagiarism, cheating on examinations, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty. The college is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Academic Integrity Procedures.

Accessibility

"In compliance with the CUNY Policy on Sexual Misconduct, Hunter College reaffirms the prohibition of any sexual misconduct, which includes sexual violence, sexual harassment, and gender-based harassment retaliation against students, employees, or visitors, as well as certain intimate relationships. Students who have experienced any form of sexual violence on or off-campus (including CUNY-sponsored trips and events) are entitled to the rights outlined in the Bill of Rights for Hunter College.
a.Sexual Violence: Students are strongly encouraged to immediately report the incident by calling 911, contacting NYPD Special Victims Division Hotline (646-610-7272) or their local police precinct, or contacting the College's Public Safety Office (212-772-4444).
b.All Other Forms of Sexual Misconduct: Students are also encouraged to contact the College's Title IX Campus Coordinator, Dean John Rose (jtrose@hunter.cuny.edu or 212-650-3262) or Colleen Barry (colleen.barry@hunter.cuny.edu or 212-772-4534) and seek complementary services through the Counseling and Wellness Services Office, Hunter East 1123.

CUNY Policy on Sexual Misconduct
Link: http://www.cuny.edu/about/administration/offices/la/Policy-on-Sexual-Misconduct-12-1-14-with-links.pdf

Tentative Lecture Schedule

Week	**Lecture Topic**	**Chapters**
1	Introduction: Our Place in the Universe, Modern view of the Universe, Big Bang developing perspective.	1
2	Discovering The Universe: Celestial Sphere, Constellations, Seasons, The Moon, Eclipses, The Ancient Mystery of the Planets	2
3	The Science of Astronomy: Early Astronomy, The Copernican Revolution. Kepler, Galileo,. The Scientific Method.	3
4	Making Sense of the Universe:Understanding Motion, Energy, and Gravity Midterm 1	4
5	Light and Telescope: Properties of Light, Properties of Matter,	5,6

Week	Lecture Topic	Chapters
	Phases of Matter, Light The Cosmic Messenger: Atomic Structure and Spectra, Learning from Spectra. Doppler Effect	
6	Formation of the Solar System, The Nebular Theory	7,8
7	Earth and the Terrestrial World	9
8	Our Star: Why Does the Sun Shine? Structure of The Sun. Midterm 2	14
9	Surverying the Stars: Stellar Luminosity, Stellar Surface Temperature, Stellar Masses, The Hertzsprung-Russell Diagram, Star Clusters.	15
10	Star Stuff: Life as a High-Mass Star, The Lives of Close Binary Stars, Mass Exchange.	16,17
11	The Bizarre Stellar Graveyard: A Star's Final Battle, White Dwarfs, Neutron Stars, Black Holes: Gravity's Ultimate Victory, The Mystery of Gamma-Ray Bursts Midterm 3	18
12	Our Galaxy	19
13	A Universe of Galaxies: Galaxies and Cosmology: Island of Stars, Types of Galaxies, Galactic Distances. Hubble's Law, Age of the Universe, Expansion of the Universe.	20, 21
14	The Birth of Universe: Beginning of Time, The Big Bang and Evidence of The Big Bang, Evolution of the Universe and Inflation, Open questions in cosmology	22

Course ID : chen33106

Pearson | Mastering | Astronomy

Student Registration Instructions

To register for Basic Concepts of Astronomy:

1. Go to https://mlm.pearson.com/enrollment/chen33106
2. Sign in with your Pearson student account or create your account.

   For Instructors creating a Student account, do not use your instructor credentials.
3. Select any available access option, if asked.
   - » Enter a prepaid access code that came with your textbook or from the bookstore.
   - » Buy instant access using a credit card or PayPal.
   - » Select **Get temporary access without payment**.
4. Select **Go to my course**.
5. Select **Basic Concepts of Astronomy** from My Courses.

If you contact Pearson Support, give them the course ID: chen33106

To sign in later:

1. Go to https://mlm.pearson.com
2. Sign in with the same Pearson account you used before.
3. Select **Basic Concepts of Astronomy** from My Courses.

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