



Exploring Astronomy: Special Topics

Course Number:	AST 102	Term:	Summer, 2021
Instructor:	TBA	Email:	
Contact Hours:	48	Meeting Times:	TBA
Credits:	3.0		

Course Description:

This is a companion course to the AST 101 Introduction to Astronomy survey course. In this course, students will explore in greater depth the topics covered in AST 101. They will go beyond fundamental knowledge and continue evaluating and critiquing the astronomical evidence behind theories presented in AST 101. Special emphasis will be placed on activities and homework that allow students to make and analyze astronomical observations firsthand. Students will also be exposed to and debate contemporary and controversial topics in modern astronomy today.

Learning Objectives:

Upon successful completion of this course, students will be prepared to:

1. Analyze findings from firsthand astronomical observations
2. Evaluate theories on the formation of stars and planets
3. Analyze properties of various astronomical objects
4. Evaluate evidence supporting major cosmological theories
5. Critique arguments in contemporary debates in astronomy

Required Textbook and Course Materials:

Textbook: Astronomy

Authors: Andrew Fraknoi; David Morrison; Sidney C. Wolff

Edition: 2016 or later

ISBN-13: 978-1938168284

Supplementary readings will be assigned by the professor.

Language of Instruction:

This course is taught entirely in English, including lectures, homework, assignments and examinations. Teaching assistants will be fluent in both English and Mandarin.

Course Prerequisites:

AST 101 Introduction to Astronomy or equivalent (pre- or co-requisite)

University Policies

Class Format

In Person. Course activities, discussions, assignments and resources will be made available at the start of and during the course.

Attendance, Participation and Deliverables

Courses are very intensive and in order to be successful, students need to attend every class. Attendance is required for all lectures and class activities. Class participation is expected from every student and form a significant portion of the final course grade

All course deliverables (homework assignments and tests) are due on time as assigned. This course includes *no* make-ups, postponements or additional assignments, except for verified medical emergencies. If you miss an exam/assignment due to a non-sanctioned absence, your score on that exam/assignment will be zero.

Academic Dishonesty

All cases of academic dishonesty will be diligently pursued. Academic dishonesty includes representing the work of another as one's own work or cheating by any means. Academic dishonesty also includes aiding, abetting, concealing or attempting such activity. The penalty is automatic failure of the course and possible suspension from the university.

Grading Scale

Grading Scale (%)

97 – 100	A+	77 – 79	C+
93 – 96	A	73 – 76	C
90 – 92	A-	70 – 72	C-
87 – 89	B+	67 – 69	D+
83 – 86	B	63 – 66	D
80 – 82	B-	60 – 62	D-
		0 - 59	F

Professor- and Course-Specific Policies (*Tentative*)

Reading

Reading the sections of the textbook corresponding to the class lectures and assigned homework exercises is considered part of the homework assignment. You are expected to read the assigned material in advance of the lecture.

Homework

You are encouraged to discuss general problem-solving methods with other students, but the solutions you hand in must be uniquely your own. Do not copy your colleague's work because you will not learn the material if you do.

Grade Components:

Attendance	10%
Homework	20%
Quizzes	20%
Exams	50%
Total	100%

Course Schedule (*Tentative*)

Note: The course schedule runs concurrently with AST 101. As outlined with examples below, AST 102 supplements AST 101 topics by going into further depth on them with additional assignments and activities, exploring them from other lenses, critiquing and debating them, and exploring additional related topics.

Module	Topics
1	<p>Science and the Universe: A Brief Tour</p> <p>Observing the Sky: The Birth of Astronomy</p> <ul style="list-style-type: none"> • Special topics assignment: Studying astronomy as the ancients did <p>Orbits and Gravity</p> <ul style="list-style-type: none"> • Special topics assignment: Connection to physics <p>Earth, Moon, and Sky</p> <ul style="list-style-type: none"> • Special topics debate: What do we gain by visiting the moon? Should we return? <p>Radiation and Spectra</p> <p>Astronomical Instruments</p> <ul style="list-style-type: none"> • Special topics debate: How can we know if our astronomical observations are accurate? <p>Special Topic: Astronomers throughout History</p> <p>Special Topics assignment: Explaining recent astronomy news to an astronomer from the past</p>
2	<p>Other Worlds: An Introduction to the Solar System</p> <p>Earth as a Planet</p> <ul style="list-style-type: none"> • Special topics debate: How unique is Earth? <p>Cratered Worlds</p> <p>Earthlike Planets: Venus and Mars</p> <ul style="list-style-type: none"> • Special topics debate: Will humans ever live on Mars? <p>The Giant Planets</p> <ul style="list-style-type: none"> • Special topics assignment: <p>Rings, Moons, and Pluto</p> <ul style="list-style-type: none"> • Special topics debate: Why would we care about Pluto's change in planetary status? <p>Special topic: The Possibility of Extraterrestrial Life</p> <p>Special topics assignment: Presenting evidence of life on another planet</p>

3	<p>Comets and Asteroids: Debris of the Solar System</p> <p>Cosmic Samples and the Origin of the Solar System</p> <ul style="list-style-type: none"> • Special topics assignment: Findings from samples <p>The Sun: A Garden-Variety Star</p> <ul style="list-style-type: none"> • Special topics assignment: Nighttime observation and measurement <p>The Sun: A Nuclear Powerhouse</p> <p>Analyzing Starlight</p> <ul style="list-style-type: none"> • Special topics assignment: Nighttime observation and measurement <p>The Stars: A Celestial Census</p> <p>Special Topic: Existential Threats to Earth from Space</p> <p>Special topics assignment: Preparing for and responding to a threat from space</p>
4	<p>Celestial Distances</p> <ul style="list-style-type: none"> • Special topics assignment: Measuring distance <p>Between the Stars: Gas and Dust in Space</p> <p>The Birth of Stars and the Discovery of Planets outside the Solar System</p> <p>Stars from Adolescence to Old Age</p> <ul style="list-style-type: none"> • Special topics assignment: Tracking the life cycle of a star <p>The Death of Stars</p> <p>Black Holes and Curved Spacetime</p> <ul style="list-style-type: none"> • Special topics debate: Could wormholes be real? <p>Special Topic: Time Travel—Science or Science Fiction?</p> <p>Special topics assignment: The physics of time travel</p>
5	<p>The Milky Way Galaxy</p> <p>Galaxies</p> <ul style="list-style-type: none"> • Special topics debate: <ul style="list-style-type: none"> ○ Will humans ever visit other galaxies? <p>Active Galaxies, Quasars, and Supermassive Black Holes</p> <p>The Evolution and Distribution of Galaxies</p> <p>The Big Bang</p> <ul style="list-style-type: none"> • Special topics debate: <ul style="list-style-type: none"> ○ What was before the Big Bang?

	<p>Life in the Universe</p> <p>Special topic: Dark Matter and Dark Energy</p> <p>Special topic: Contemporary Debates in Modern Astronomy</p> <p>Special topics assignment: Defend a position in a contemporary astronomy debate</p> <p>Final Exam</p>
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