

Syllabus for AST 4402 Galaxies and Cosmology Fall 2021

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Office: 211A Bryant Space Science Center
Office Hours: WF 11:45-12:45
Class Periods: MWF4 (10:40-11:30)

Special Note: For at least the first few weeks of the semester, there will be a HyFlex option for students who wish to join remotely. The link can be found under "Zoom Conferences" in the left menu within Canvas. All exams will still be in class and cannot be taken remotely.

Online Course Information: Handouts and assignments will be posted on Canvas.

Pre-requisites and Co-requisites: AST 3018, AST 3019, and a working knowledge of calculus.

Credits: 3

Textbooks: No required text, but the following two are suggested for reference.
Introduction to Cosmology, Barbara Ryden
Extragalactic Astronomy and Cosmology, Peter Schneider

Course Content

This course is intended to provide an in-depth look at the foundations of our current understanding of the Universe on the largest scales. The course is designed for science majors, and as such a good working knowledge of mathematics up through calculus is assumed. To best complement AST 4211 and AST4300, the course will be largely focused upon cosmology, with the broad factors driving galaxy evolution presented within this framework.

Course & Grading Information

Your grade for the course will be based on the following:

Assignments and Participation	35%
Student-led discussions/lectures	15%
Exams (Sep 17, Oct 25, Dec 8)	50%

Details regarding UF grading policies can be found at:
<https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

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The following grade scale is guaranteed. Your actual final grade will be no lower than on this scale, which may be curved based upon the overall performance of the class.

A	>90	B-	77-79	D+	65-67
A-	86-89	C+	74-76	D	62-64
B+	83-85	C	71-73	D-	59-61
B	80-82	C-	68-70	E	<59

Homework

Homework assignments must be submitted on time (at the beginning of class) to receive full credit. For late assignments there will be a deduction of 33% per day. No homework extensions will be granted unless the extension is approved in advance of the deadline or documentation of a medical issue is provided.

Student-led discussions/lectures

Over the course of the semester, starting in week 4, you will each be assigned a 25 minute (1/2 class period) slot during which you will be expected to lecture or lead a discussion on an assigned topic. This will not be a class presentation, but rather you will be in charge of that segment of the lecture, or group discussion of a topic related to an assigned reading, for the day. I will assign topics during week 2 of the semester, and will let you know two weeks in advance when you will likely be leading the discussion or lecturing (though on occasion this may drift a class period later depending on the pace of the course).

Exams

There will be three exams during the semester. Each will be worth an equal amount. All exams will be comprehensive on all material covered up to that point in the semester, but will focus primarily on the material covered since the last exam.

Class Expectations

There will be occasional reading assignments for this class. You are expected to read the material in advance of the lectures and be ready to actively participate in class. You are also expected to not engage in any activity during class that is distracting to other students or detrimental to their ability to learn. Please be courteous to your fellow classmates and turn off the ringer on your phones.

Make-up Policy

Students are expected to complete all requirements by the specified due dates. If you miss an assignment due to an excused absence as specified in the undergraduate catalog and provides the instructor with timely notification, you will be allowed a reasonable time to make up the missed work. The format of any make-up exam will be at the discretion of the instructor.

Academic Honesty Policy

UF students are bound by the Honor Pledge. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: “On my

honor, I have neither given nor received unauthorized aid in doing this assignment.” The Honor Code (<http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel.

I strongly adhere to the previous statements and **DO NOT TOLERATE CHEATING**. Any student caught cheating will automatically fail the course and the case will be referred to the Director of Student Conduct and Conflict Resolution.

Special Accommodations

Students who require a classroom accommodation are required by UF policy to arrange accommodations themselves when needed. Students must first contact the Dean of Students Office of Disability Resources in Peabody 202 (352-392-1261). Please see the University of Florida Disability Resources website for more information at <http://www.dso.ufl.edu/drp/services/>. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation.

UF Counseling Services

On-campus resources are available at the UF Counseling & Wellness Center (392-1575) for students experiencing personal or stress related problems.

Student Feedback

Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at <https://evaluations.ufl.edu>. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu/results/>.

Covid Notice

All students are strongly encouraged to wear masks during class. If possible, I plan to arrange for a Hyflex option for any students who prefer to attend remotely.

Recording

Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

A “class lecture” is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not

include lab sessions, student presentations or student-led instruction, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session.

Publication without permission of the instructor is prohibited. To “publish” means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.

Preliminary Lecture Schedule (Subject to Change)

The table below indicates the approximate dates for each topic. Updated will be given in class as the schedule changes. Magazine articles will also be assigned periodically.

Lecture Date	Lecture Content
Week 1 (8/23)	<i>Fundamental Questions</i>
Week 2 (8/30)	<i>Geometry and Dynamics of the Universe</i>
Week 3 (9/6)	<i>Big Bang Cosmology</i>
Week 4 (9/13)	<i>The Early Universe</i>
Week 5 (9/20)	<i>Thermal History of the Universe, Exam Review, Exam on 9/24</i>
Week 6 (9/27)	<i>Inflation</i>
Week 7 (10/4)	<i>Contents of the Universe: Normal and Dark Matter</i>
Week 8 (10/11)	<i>Contents of the Universe: Dark Matter and Dark Energy</i>
Week 9 (10/18)	<i>Testing the Standard Cosmological Model, Exam Review</i>
Week 10 (10/25)	<i>Testing the Standard Cosmological Model, Exam on 10/29</i>
Week 11 (11/1)	<i>Testing the Standard Cosmological Model</i>
Week 12 (11/8)	<i>Galaxy Formation and Evolution: Hierarchical structure growth, reionization, first stars and galaxies</i>
Week 13 (11/15)	<i>Galaxy Evolution: Star formation history of the Universe, Chemical Evolution, Galaxy Luminosity Function</i>
Weeks 14/15 (11/22)	<i>Galaxy Formation and Evolution: Mergers, History of a typical galaxy, The Future of the Universe</i>
Week 16 (12/6)	<i>Cosmology in 2020: Current Status and Open Questions, Exam on 12/8</i>

