Course Information

AST 4414 / AST 5416:
Cosmology and Structure Formation

HCB 219
T-Th 2:00–3:15 PM

Credit: 3 semester hours

Prerequisites:
Introduction to Astrophysics,
Introduction to Modern Physics

Instructor

Prof. Christopher L. Gerardy
Office: 608 Keen
Phone: 644-3437
email: gerardy@physics.fsu.edu

Office Hours: Wednesday 1:00-3:00 p.m. or by appointment.

Overview

Cosmology, the study of the dynamical evolution of the universe, is at the forefront of modern astronomy. The consequences of the “Big Bang” and the subsequent expansion of the universe touch almost every aspect of modern astrophysics. In this course we will examine the most important observational phenomena and explore the basic theoretical framework upon which our current understanding of cosmology is based. As this “current understanding” is a rapidly moving target, we will also encounter mysteries, secrets and controversies. Cosmology is an active, “living” science and much of the terrain we will be covering will be either newly minted or even just vaguely sketched.

Course Texts


There aren’t any perfect choices for texts in cosmology. The situation is complicated by the fact that the field has undergone a relatively significant revolution in the last decade. This has resulted in making many of the ‘classic’ texts in the field obsolete (or at least very incomplete) while many of the more recent texts choose to emphasize recent results and provide rather cursory discussion of the basics. In this respect, the Weinberg text is relatively unique in that it covers both the fundamentals and the more recent aspects in a comprehensive and coherent manner. It is also well written (at least the actual text parts), and contains some rather insightful discussion. This text will be our primary information source for the course.

However, the Weinberg text also has some downsides. The most serious for this course is a tendency toward mathematical formalism, which can be challenging for those who are learning the material for the first time. (Can’t see the forest for the trees!) In this respect, the rather thin little book by Liddle is a good complement for the much denser Weinberg tome. Indeed, Liddle’s text is a very clean and lucid introduction to the basics which has made it very popular for introductory courses. It’s also comparatively cheap (at least in paperback) and I highly recommend finding a copy if you find the Weinberg text rough going.
Readings and JiTT Assignments

This semester I’m attempting use some ideas from a teaching pedagogy known as “Just-in-time Teaching.” Aside from having a name that rightly suggests it dates from the late 1990’s and dawn of the ubiquitous Javascript, JiTT is designed to make lecture time more useful through the use of electronic communication tools. In particular, the strategy we will be adopting here is to use reading assignments (mostly from the course textbook) as the initial and primary source of material exposition. Instead of using lectures to cover the material for the first time, we will instead use it to discuss the material, investigate points of confusion, and deepen our understanding.

In practice, there will typically be a reading assignment for every lecture, and associated with that reading there will be a “JiTT assignment” [probably implemented as an assignment in Blackboard] which will be due by 8:00 AM on the day of lecture. These assignments will generally consist of some leading questions based on the reading assignment, as well as some free-response sections where you can include questions or comments on pieces of the material that you found difficult, or couldn’t understand. I will review these before lecture and try to adapt the material accordingly, and they will hopefully be used as starting points for our in-class discussions.

The JiTT assignments will be graded, but with a heavy emphasis on having done the reading and made an honest attempt at answering the questions.

Homework Assignments

Homework will be assigned roughly every 1-2 weeks and will usually be due on Thursday afternoons. The assignments will be posted to the class blackboard website, as will solutions. I will try my best to post solution sets and return the graded homework in a timely manner.

Collaboration Policy

Collaboration is generally encouraged, and indeed one of the reasons for adopting the discussion style “lectures” is to try and foster a collaborative learning environment. Thus you may freely collaborate on the homework assignments. However, the work you turn in should still be your own. (i.e. collaborate, don’t transcribe). If you pull significant material from a source (e.g. online), cite it in some manner.

However direct collaboration is not allowed for the JiTT assignments. You may discuss the reading and course material with other students, but your answers for the JiTT assignments should reflect your understanding of the material. (Including, very importantly, your lack of understanding!) The whole point of the JiTT assignments is so I can see where the problem areas are and we can spend our in-lecture time more efficiently.

The tests will be open book, open notes, and open ‘net’. You live in the 21st century and so I see little point in forbidding the use of 21st century tools. However the tests will be otherwise non-collaborative, so please don’t use social networking tools to discuss test questions.

Interview

In addition two traditional written exams, assessment will be based on individual interviews (~1 hr), scheduled during the last week of classes or during finals week.
Cosmology and Structure Formation

Grading

Your grade in the course will be determined via

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<td>Homework</td>
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<tr>
<td>Reading/JiTT</td>
<td>10%</td>
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<td>Midterm Exam</td>
<td>15%</td>
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<td>Interview</td>
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<td>Final Exam</td>
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Grading Scale

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Academic Honor Policy

The Florida State University Academic Honor Policy outlines the University’s expectations for the integrity of students’ academic work, the procedures for resolving alleged violations of those expectations, and the rights and responsibilities of students and faculty members throughout the process. Students are responsible for reading the Academic Honor Policy and for living up to their pledge to “. . . be honest and truthful and . . . [to] strive for personal and institutional integrity at Florida State University.” (Florida State University Academic Honor Policy, found at http://dof.fsu.edu/honorpolicy.htm.)

Americans with Disabilities Act

Students with disabilities needing academic accommodation should:

1. register with and provide documentation to the Student Disability Resource Center; and
2. bring a letter to the instructor indicating the need for accommodation and what type. This should be done during the first week of class.

This syllabus and other class materials are available in alternative format upon request. For more information about services available to FSU students with disabilities, contact the:

Student Disability Resource Center
874 Traditions Way
108 Student Services Building
Florida State University
Tallahassee, FL 32306-4167
(850) 644-9566 (voice)
(850) 644-8504 (TDD)
sdrc@admin.fsu.edu
http://www.disabilitycenter.fsu.edu/