Course Syllabus for PHYS F472J (1 credit)

Advanced Topics: Physical Cosmology

Instructor: Martin Truffer, mtruffer2@alaska.edu

Prerequisites: PHYS F220; PHYS F301; or permission of instructor.

Meeting times: Class: 1:00 – 2:00 PM, Monday, Wednesday, Friday
Note that the instructor will be absent for the week of 4th of March.
We will make up this time with an additional week at the end of the module.
Last regular meeting time: 1 April

Website: I will use Google Classroom to distribute homework, solutions and other material

Materials Needed: Gravity, James B. Hartle (2003), Pearson

Content:

This short course will provide an overview of some concepts in physical cosmology. It is aimed at advanced undergraduate or beginning graduate students in physics. The course covers some concepts in General Relativity and what they tell us about the evolution of the universe. We will discuss how distance and age relationships are determined. The concept and evidence for the big bang and an inflationary early phase of the universe will be discussed.

Course Goals and Learning Outcomes:

The course goal is to familiarize students with some of the basic concepts of physical cosmology, including mathematical models for the universe, the concept of the Big Bang, inflation, the expansion of the universe, and, time permitting, galaxy formation.

Lectures:

Lectures will mostly be delivered on the blackboard.

Homework:

There will be one homework assignment per week. The assignment will be handed out (and posted on Google Classroom) on Wednesdays and will be due in on the following Wednesday by beginning of class (1 pm). You are encouraged to work with others on the homework, but make sure the paper you turn in is not simply copied from someone else. These assignments help me assess your understanding of the material, and will count
toward your final grade. **Late problem sets will generally not be accepted.** Solutions will be distributed in class. You are **strongly** encouraged to look at these solutions to help you understand how to approach these problems; it will also help for the final.

**Final Exam:**

The final exam will be a take-home exam that is due at **5:00 PM, Wednesday, April 3th.**

**Grading**

The course grade will consist of the following components:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Final exam</td>
<td>40%</td>
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<tr>
<td>Homework</td>
<td>60%</td>
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Your final grade will depend on your overall percentage score (A: 90-100%, B: 80-90%, C: 70-80%, D: 60-70%, F: 0-60%). I will use attendance and course participation to round your grade up or down.

**Contacting Me:**

I have office hours 1:00 - 4:00 pm Tuesday and Thursday (Rm 108 REIC). At other times I'm in my office at the Geophysical Institute: Rm 401D; phone number: 474 5359. The best way to contact me is email, which I check very regularly. You can contact me anytime. I encourage to call or email first to make sure I'm in my office. I will also meet you in the Natural Science building outside office hours by appointment.

**Complaints and Concerns:**

You are always welcome to talk to me about anything, however, if you have a non-subject matter question or concern that cannot be resolved by me contact the department chair, Dr. Wackerbauer.

**Student Code of Conduct:**

You are expected to submit work that is your own and properly acknowledge the work of others. You are responsible for understanding and adhering to the [Student Code of Conduct](#) that is printed in the UAF Course Catalog. **Abide By It.** Violations of the Code will be reported to the Dean of Students.

Every qualified student is welcome in my classroom. As needed, I am happy to work with you, disability services, veterans' services, rural student services, etc to find reasonable accommodations. Students at this university are protected against sexual harassment and discrimination (Title IX), and minors have additional protections. As required, if I notice or am informed of certain types of misconduct, then I am required to report it to the appropriate authorities. For more information on your rights as a student
and the resources available to you to resolve problems, please go the following site:  
www.uaf.edu/handbook/

UA is an AA/EO employer and educational institution and prohibits illegal discrimination against any individual: https://alaska.edu/nondiscrimination/.

Your instructor follows the University of Alaska Fairbanks Incomplete Grade Policy: “The letter “I” (Incomplete) is a temporary grade used to indicate that the student has satisfactorily completed (C or better) the majority of work in a course but for personal reasons beyond the student’s control, such as sickness, has not been able to complete the course during the regular semester. Negligence or indifference are not acceptable reasons for an “I” grade.”

Effective communication: Students who have difficulties with oral presentations and/or writing are strongly encouraged to get help from the UAF Department of Communication’s Speaking Center (907-474-5470, speak@uaf.edu) and the UAF English Department’s Writing Center (907-474-5314, Gruening 8th floor), and/or CTC’s Learning Center (604 Barnette Street, 907-455-2860).