

Syllabus for 33-777: Introductory Astrophysics; Fall 2018

1 Basic course information

Lectures: Tuesday/Thursday, 9:00 - 10:20 am, 7316 Wean

Instructor: Prof. Sergey Koposov, 8313 Wean, skoposov@cmu.edu

Textbooks: *Modern Astrophysics*, B. W. Carroll and D. A. Ostlie, 2006

Astrophysics for Physicists, A. R. Choudhuri, 2010, Cambridge University Press

Office hours: 2-3pm on Mondays, or by appointment.

2 Course description

This course is the first graduate astrophysics course, intended to provide an introduction to the physical principles behind modern astronomy and cosmology. The topics to be covered include stellar structure and evolution, our galaxy, interstellar medium, extra-galactic astrophysics, and cosmology. The course touches on the physics of gravity, thermodynamics, fluid dynamics, radiative process, and nuclear processes in the process of covering basic astrophysics.

3 Course goals

Students will develop an understanding of diverse astrophysical systems and the physics that governs them. By the end of the semester, students should be able to do all of the following:

- Understand key areas and research directions in Astrophysics
- State the basic physical principles that are relevant for the aforementioned physical systems, and derive equations by applying those principles;
- Understand the scientific discussion in journal articles and astrophysics seminars.

4 Prerequisites

No previous knowledge of astronomy/astrophysics is required, but knowledge of basic undergraduate level physics is assumed.

5 Communication

The course will use Canvas for distribution of grades and course material.

6 Evaluation

- Class participation (15%)
- Mid-semester paper discussion (15%)
- End of semester project (20%)
- Homework assignments (20%)
- Final exam (30%)

The cutoffs for grades are $> 85\%$, $75 - 85\%$, $65 - 75\%$, $55 - 65\%$, and $< 55\%$ for A, B, C, D, and F respectively.

Homework assignments will generally be given biweekly, and will be due at the start of lecture 7 days later. Students are welcome to discuss the homework assignments but should ensure that the details of the solutions they submit are their own. Homework that is submitted late will NOT be accepted, however ONE worst (or missing) grade will not be included in the final grade calculation.

The mid-semester paper discussion will be held during midterms week. The whole class will be assigned to read about three papers and prepare some questions related to the papers. There will be informal discussion only (no slides / powerpoint presentation).

The end of semester project involves researching a selected topic from a list of possible topics, and preparing a presentation. It involves submitting to me an outline two weeks before the presentation, and you will be provided an opportunity to practice your talk with me one-on-one. Then you will present the topic for 20 minutes during class time. More details, including a topic list will be distributed after the midterms.

7 Students with Disabilities

If you have a disability and are registered with the Office of Disability Resources, I encourage you to use their online system to notify me of your accommodations and discuss your needs with me as early in the semester as possible. I will work with you to ensure that accommodations are provided as appropriate. If you suspect that you may have a disability and would benefit from accommodations but are not yet registered with the Office of Disability Resources, I encourage you to contact them at access@andrew.cmu.edu.

8 Students' Health & Well-being

Take care of yourself. Do your best to maintain a healthy lifestyle this semester by eating well, exercising, avoiding drugs and alcohol, getting enough sleep and taking some time to relax. This will help you achieve your goals and cope with stress.

If you or anyone you know experiences any academic stress, difficult life events, or feelings like anxiety or depression, we strongly encourage you to seek support. Counseling and Psychological Services (CaPS) is here to help: call 412-268-2922 and visit <http://www.cmu.edu/counseling/>. Consider reaching out to a friend, faculty or family member you trust for help getting connected to the support that can help.