

Astronomy 300A
Dynamics and Mechanics in Astrophysics
(Fall 2016)

Lectures: 11:00AM-11:50AM MWF in Steward N204

Instructor: Prof. K. Kratter
Office: SO N328

TA: Michelle Wilson
Office: T101 (trailer)
Class Email: ASTRKratter@as.arizona.edu

Prof. Kratter's Office hours:
2:30-4:00PM Wednesdays

Michelle Wilson's Office hours:
10-11AM, Mondays, Wednesday

Course Description

In this course we will survey the role of gravity in astrophysics. We will begin with the study of simple Keplerian orbits, and then explore progressively more complex dynamical systems. We will then study fluid dynamics and astrophysical applications towards the end of the semester. This class will also focus heavily on problem solving skills including the use of dimensional analysis and order of magnitude reasoning. We will also touch on computational methods for problem solving throughout the course of the semester.

Topics to be covered
Dimensional Analysis
Order of Magnitude Reasoning
Stellar Planetary dynamics
Galactic dynamics
Atmospheres
Fluid Dynamics

GRADING: Your course grade will be based on:

- Homework (drop lowest score): 25%
- In class activities / problem solving: 25% (drop lowest two scores)

- In class tests (drop lowest score): 35%
- Final Project: 15%

The class will not be curved. The correspondence between final percentages and letter grades will be: **A:** 85% – 100%; **B:** 70% – 85%; **C:** 50% – 70%, **D:** 30% – 50%; **E:** 0% – 30%.

TEXTBOOK For this course we will use “Principles of Astrophysics,” by Charles Kecton. This book is available for **FREE** from the UofA online library system as a PDF document. You can find it [online here](#).

MIDTERM TESTS There will be three in class tests during the semester. Only your best two scores will count. No makeup tests without a prior approved Deans Excuse. They are tentatively scheduled for:

Friday, September 30th

Monday, October 26th

Friday, November 18th

FINAL PROJECTS In lieu of a final exam, each student will carry out a small research project due at the end of the semester. Students will pick an astronomical system and explain some fundamental aspect of its evolution / formation based on the course material. The project will involve research in the astronomical literature, a short write-up, and an in-class presentation during the final week of class. More details to be provided during the semester.

Course Conduct and Expectations

Please come to class ready to learn and engage with your peers. While there is no strict mandatory attendance policy, participation and in-class activities make up a substantial portion of your final grade. We will be doing a lot of in class problem solving. In order to ensure a productive learning environment for all students, please note the following class rules:

1. NO cellphones in class. They must be kept in a bag or pocket and on silent.
2. Laptops / tablets **ONLY** for note taking.
3. No class disruptions (talking, note passing, etc).
4. Obey the University of Arizona Code of Academic Integrity: [available here](#)
5. Follow the University of Arizona Non-threatening behavior policy: [available here](#)
6. Adhere to the University of Arizona nondiscrimination and anti-harassment policy: [available here](#)

Course Email and Websites:

In this class we will make regular use of D2L . It is your responsibility to check D2L regularly for course notifications / updates / and assignments.

Email: All emails regarding the course should be sent to ASTRKratter@as.arizona.edu. Emails sent to ANY OTHER email address will not get a response. Expect response times of 48 hours or less. This email address goes to both the instructor and the TA.

Course Updates: The information contained in the course syllabus and schedule, other than the grade and absence policies, may be subject to change with reasonable advance notice.

Students with disabilities who require reasonable accommodations to fully participate in course activities or meet course requirements are encouraged to register with the Disability Resource Center (<http://drc.arizona.edu>) and contact Prof. Kratter to discuss accessibility issues.

