AST 2001 is an introductory course for students with astrophysics majors and minors. Mathematical and physical discussions presume that the student has had a year of both calculus and physics at the college level. The small and informal class environment should encourage stimulating discussions. This class will introduce you to a broad range of topics in modern astrophysics, with an emphasis on how we measure astrophysical quantities and how we learn what these observations tell us about the physics of the universe. By the end of this class you will have a much greater facility with elementary theoretical calculations and making the kind of order of magnitude estimates that often guide the work of scientists and engineers. A limited number of special topics representative of current astrophysical research will be investigated in depth. The ultimate objective of the course is to give you the basic tools that you will need to read the current literature on astrophysics with a basic level of understanding. I will generally be available in my office TWF after 1:00 PM (I am in Tate Hall 285-04) or at other times by appointment (call 612-624-7806). Grading will be based on five problem sets (30%), two five question mid-semester exams (20% each), and a seven question final (30%). The two mid-semester exams will cover material covered in the first and second thirds of the course. 70% of the questions on the final exam will be on material covered in the last third of the course. 30% of the questions on the final exam will be taken from material covered on the two mid-semester exams. Examinations will be open book and notes. The questions will be a combination of problems and essays. The text is “An Introduction to Modern Astrophysics, Second Edition” by B. W. Carroll and D. A. Ostlie. We will not be covering the text in its entirety, but will instead use it as a reference source for discussions on selected topics. This text is temporarily out of print and only a limited number of copies are available in the UM Bookstore right now. To obtain hard copies and e-copies from other sources, see:

https://www.amazon.com/Introduction-Modern-Astrophysics-Bradley-Carroll-ebook/dp/B075WXXX7V/ref=mt_kindle?_encoding=UTF8&me=

Students are expected to consult elementary astronomy survey text books or the internet to supplement the lecture material. We will address selected topics from the following list, which is not necessarily in order:

1. Brief introduction - the origin and contents of the Universe
2. Orbital mechanics
3. Radiation and telescopes
4. Celestial mechanics
5. The contents, formation, and origin of the solar system
6. Comets, asteroids, meteors, and giant impacts
7. Earth-moon system and the physics of the planets
8. Elementary solar physics; the sun as a star
9. Observation and measurement of stellar properties
10. Stellar structure and evolution
11. White dwarfs, neutron stars, and black holes
12. Novae and supernovae
13. The galaxy and the interstellar medium
14. Topics in extra galactic astronomy and cosmology
15. Constructing and using current ground-based and aerospace astronomy observatories
16. Other topics of current interest by the lecturer and guest lecturers (TBD)

GRADING BY PERCENTAGE OF THE TOTAL GRADE AND IMPORTANT DATES:

FIVE PROBLEM SETS: 30%

Due Dates for Problem Sets for AST 2001, Spring Semester 2018:

Problem set #1: Thursday, February 1, 2018
Problem set #2: Thursday, February 22, 2018
Problem set #3: Thursday, March 22, 2018
Problem set #4: Thursday, April 12, 2018
Problem set #5: Thursday, May 3, 2018

THREE EXAMINATIONS: 70%

Examination Dates for AST 2001, Spring Semester 2018:

Mid-semester exam #1: Thursday, February 15, 2018 (Tate Hall 101): 20%
Mid-semester exam #2: Thursday, March 29, 2018 (Tate Hall 101): 20%
Final exam: 1:30 PM - 3:30 PM, Friday, May 11, 2018 (Tate Hall 101): 30%

Grading will be on an absolute scale: A > 90%; B > 80%; C>70%; D > 60% (These are the bottom floors for the minus (-) grade levels.) A grade of S will be awarded for performance at the level of C- (70%) or above. The assignment of an "I" grade will be made only under very special circumstances.
You are expected to be familiar with and follow the Regents' Policies for Student Conduct and Student Responsibilities which can be viewed at:


and:

https://policy.umn.edu/education/studentresp.

The head TA for the class is Allison Enterline. She will be responsible for supervising the grading. Allison can be reached by email at enter015@umn.edu or by cell phone at (920)422-2080. The office hours that will be held by the TA’s in Tate 270 (my laboratory) are as follows:

Allison Enterline (enter015@umn.edu): 10:30 AM - 12:00 PM Wednesday

Megan Birch (birch092@umn.edu): 12:30 PM - 2:00 PM Thursday

Katie Chworowsky (chwor001@umn.edu): 12:15 PM - 2:00 PM Tuesday

Aript Arora (arora125@umn.edu): 12:00 PM - 1:30 PM Friday

Jake Holley (holle273@umn.edu): 10:00 AM - 11:00 AM Friday