Instructor contact information: Michael Brotherton, PS 217, preferred: mbrother@uwyo.edu, 307-399-9524 (texts)

Office hours and open door policy: TR 12:45-2:15pm unless otherwise noted (basically after class after I’ve grabbed lunch), also by appointment. If I’m in the office, I’m usually available. I’m also usually available to answer simple questions via email (more likely in the evening, less likely in the morning – what observational astronomer likes the morning?).

Course prerequisites, co-requisites: PHYS 1210 or 1310, MATH 2200, or by permission of instructor with special circumstances. It is desirable, to have taken ASTR 1050 previously or concurrently. The calculus will be light, but we will draw a lot on physics.

Course Description: I am excited to teach you! Astronomy is awesome! This course is intended to be an advanced introduction to the Solar System and the techniques professional astronomers use to observe and analyze celestial objects. The course is aimed at students in their first or second year of the astronomy major degree program. You should already have a generic knowledge foundation of the Sun, the planets, and telescopes, ideally obtained in an introductory astronomy course such as ASTR 1050. We will build upon this foundation and begin to develop a conceptual understanding of the physical processes that drive astrophysics.

Student Learning Outcomes: The Physics and Astronomy department undergraduate program exists to produce scientists and science literate graduates who are competitive for jobs in the technical sector and for admission to graduate programs. These are the general departmental learning outcomes for physics and astronomy majors:

Outcome 1: Conceptual and analytical understanding of the four major areas of physics: Mechanics, Electricity & Magnetism, Quantum Mechanics, and Statistical Physics
Outcome 2: Understanding of scientific reasoning, i.e., the roles of theory, hypothesis, and experiment in the scientific method.
Outcome 3: Demonstration of a working knowledge of laboratory & programming skills as they relate to gathering data and comparing data to the predictions of theoretical models.
Outcome 4: Ability to communicate the results of scientific analysis in written and oral form.

For an astronomy major core class, like this one, outcome 1 may be modified for application of physics to an astronomical environment.

Required texts, readings, and special tools or materials: We will use a freely available textbook by Professor Andrea K. Dobson of Whitman University. PDF files are available on the wyocourses website as well as her personal website http://people.whitman.edu/~dobson/ under the “Intro Astro” link. They are also posted along with slides on my website:
We will use most of chapters 0, 1, 2-10, 20. Chapters 11-19 are used for ASTR 2320.

**General requirements and expectations for the course:** I expect everyone to attend class regularly – this a key class for astronomy majors – but will neither take attendance nor require it. We can accommodate homework extensions usually if asked in advance, or due to health issues or other emergencies. If something’s just late, we’ll still grade it but there will be a 50% penalty. There will be additional expectations for the lab section of the class.

**Required examinations, assignments, activities, and projects:** There will be three exams. Two will be in class during the semester (Thur. Mar 5, Thur. April 9) and the last a comprehensive exam during finals week (Thursday, May 14, 10:15AM – 12:15PM).

There will be regular problem sets due approximately weekly, likely on Tuesdays.

There is a lab section for this class, and there will be lab reports regularly due as well.

Paper and presentation: each student will research a topic relevant to the Solar System and write a short paper and make a brief presentation (4 pages; 4 minutes; 4 slides). You may choose your own topic or come to me for ideas (first come, first served, submit via email, please). A tentative outline and bibliography will be due April 16; the final paper will be due April 30.

See WyoCourses for the up to date schedule of assignments and reading.

**Grading Scale and Grading Policies:**

- A = 90+
- B= 80-90
- C = 70-80
- D= 60-70
- F= Below 60

I tend to round up, and I may curve final grades. The three exams (two plus final) will count equally, and total 60% of your grade. Homework, labs, and assignments will count for 40%

We can accommodate homework extensions usually if asked in advance, or due to health issues or other emergencies. If something’s turned in a day or more late, we’ll still grade it but there will be a 50% penalty.

**Required Participation Outside of Class Meetings:** This course includes both lab (Thursday 7:10-9:00PM, Enzi 185/195) and discussion sections (Thursday 3:10-4:00 or 4:10-5:00PM, PS224). The course teaching assistant is Lucas Gabriel Napolitano (lnapoli1@uwyo.edu). He will have his own introduction to these parts of the course and his own expectations to share. While much of the lab part of the course can be done during the scheduled hours, there will likely be the need to observe or otherwise acquire data during additional nighttime hours. This is a four-credit hour class for astronomy majors and will have a higher time commitment than other courses. It’s a good time to find out how passionate you are for the subject.
**Attendance and Absence policies.** I want everyone to come to lecture regularly, this is an important class for majors, but you’re adults and have lives. If there’s an issue with an exam date, let me know ASAP and make arrangements for an alternative time. It may be difficult or impossible to make up certain labs, for which the grade penalty may be substantial. There are some exceptions under official University policies on excused absences as outlined in [UW Regulation 2-108 (Student Attendance Policy)](#).

**Other Official Classroom Climate and Conduct** policies may be found on wyocourses. Act like curious, professional adults. Cell phones and laptops are fine. If you come to class, focus on class. Do not make recordings of class without permission.

**CAMPUS RESOURCES**

*DISABILITY SUPPORT SERVICES:* udss@uwyo.edu, 766-3073, 128 Knight Hall, www.uwyo.edu/udss

*COUNSELING CENTER:* uccstaff@uwyo.edu, 766-2187, 766-8989 (After hours), 341 Knight Hall, www.uwyo.edu/ucc

*ACADEMIC AFFAIRS:* 766-4286, 312 Old Main, www.uwyo.edu/acadaffairs

*DEAN OF STUDENTS OFFICE:* dos@uwyo.edu, 766-3296, 128 Knight Hall, www.uwyo.edu/dos

*UW POLICE DEPARTMENT:* uwpd@uwyo.edu, 766-5179, 1426 E Flint St, www.uwyo.edu/uwpd

*STUDENT CODE OF CONDUCT WEBSITE:* www.uwyo.edu/dos/conduct

Note: This syllabus is a guide. Circumstances may alter the reading and/or test schedules. You are required to check WyoCourses and your email at least once a week.

**About Me**

I am an observational astronomer specializing in the study of quasars and other types of active galaxies powered by super-massive black holes. I received my PhD from the University of Texas at Austin and have previously worked at Lawrence Livermore National Laboratory and Kitt Peak National Observatory. I've really used the Very Large Array (the "VLA", a radio telescope in New Mexico featured in the movie *Contact*), the Hubble Space Telescope, the Chandra X-ray Observatory, and many other telescopes, so I can provide you with first-hand details not found in textbooks. I'm also a science fiction writer with two novels and several short stories professionally published.

I love astronomy and look forward to sharing the wonders of the universe with you!