

PHYS 4399: Observational Astronomy
Course Syllabus for Spring 2011, MWF 11:00-11:55 am

Instructor: Dr. Wayne Keith: 793-3874, keith.wayne@mcm.edu
Office Hours: S 110-C: MWF 10-11, R 11-12, TF 1-2:30, and W 2:30-5:30
Web: <http://www.mcm.edu/~keith.wayne>
Text: Resources will be posted on Moodle
Required: tablet PC, scientific calculator, paper, pencil

Course Description: This is an advanced elective special topics course for physics majors. This course is intended to introduce the student to various topics in observational astronomy and astrophysics, including the properties of various astronomical targets, techniques used to study those targets, and the instrumentation used. Particular emphasis will be given to the analysis of asteroid search data taken by student groups at Lowell Observatory in 2008 and 2010.

Grading: 20% Homework: Assignments will be made in class and posted online. Homework will be due at the beginning of class on the date indicated. Also includes any graded activities conducted during class (quizzes, presentations, discussions, etc.)

50% Project: All students will be required to complete a research project during the semester using data collected at Lowell Observatory.

15% midterm exam: Covering the first half of the semester

15% Final exam: Covering the second half of the semester.

Attendance/Make up policy: Make-up exams will be given for excused absences only at the discretion of the instructor. Contacting the instructor via email or phone prior to missing class for any reason is strongly encouraged, even if it is for a school sponsored event.

Classroom Rules: Students are expected to be present and on-time for all class meetings. Excessive absences (more than 3 unexcused) may result in the student being dropped from the course. Computers should be used in class for course-related purposes only; violators will forfeit the use of their computer during class for a period of time up to the remainder of the semester.

ADA Policy: If you have a documented disability that may impact your performance in this class and for which you may require accommodations, you must be registered with and provide documentation of your disability to the Disability Services Office, Old Main 102, 793-4880.

Final notes: Class discussion is strongly encouraged; please feel free to ask questions, during class or outside of class, about anything that is not clear. Most Fridays will be designated for working on the asteroid project. We will still meet as a class, but there will not be a regular lecture on those days.

PHYS 4399 Spring 2011 Course Schedule

All dates and topics are tentative and subject to change except **bold** dates.

Date	Lecture #	Topic	Homework
1/17		No Class	
1/19	1	Introduction and Overview	
1/21	2	Ground Based Instruments	1
1/24	3	Space Based Instruments	
1/26	4	Asteroids - Properties	2
1/28	5	Asteroids - Observing	
1/31	6	Asteroids - Finding	
2/2	7	Reporting Asteroid Discoveries	
2/4		Asteroid Project	3
2/7	8	Sun-like Stars	
2/9	9	Dwarf and Giant Stars	
2/11		Asteroid Project	
2/14	10	Stellar Interiors	
2/16	11	Neutrino Emissions	4
2/18		Asteroid Project	
2/21	12	H-R Diagrams – Clusters	
2/23	13	Variable Stars	
2/25		Asteroid Project	5
2/28	14	Stellar Evolution	
3/2	15	Planetary Nebulae	
3/4		Asteroid Project	
3/7		Midterm Exam	6
3/9	16	Novae	
3/11		Asteroid Project	
3/14		Spring Break	
3/16		Spring Break	
3/18		Spring Break	7
3/21	17	Supernovae	
3/23	18	Neutron Stars	
3/25		Asteroid Project	
3/28	19	Stellar Black Holes	8
3/30	20	Supermassive Black Holes	
4/1		Asteroid Project	
4/4	21	Observing Black Holes	7
4/6	22	Interstellar Medium	
4/8		Asteroid Project	
4/11	23	The Milky Way	
4/13	24	Galactic Structure	7
4/15		Asteroid Project	
4/18	25	Galaxies	
4/20	26	Galactic Survey	
4/22		No Class (Easter)	8
4/25		No Class (Easter)	
4/27	27	Active Galaxies and Quasars	
4/29		Asteroid Search Result Presentations	
5/2	28	Cosmological Models	
5/4	29	Modern Cosmology	8
5/6		Final Review	
5/9		Final Exam – (Monday 10:30am – 12:30pm)	

Course objectives and goals	Linked to which departmental program goal(s)	Linked to which institutional goal(s)?	Types of evidence used to demonstrate student achievement of objectives & goals
Students will demonstrate conceptual understanding of the basic principles of Solar System Physics.	- to prepare physics graduates for a wide range of career opportunities including not only graduate study in physics or astronomy; but also, science teaching and careers in industry and science-related business.	1,2,3,8	Successful completion of in-class exam essay questions.
Students will demonstrate the ability to apply various mathematical methods towards solutions of Solar System Physics problems.	- Same as above	1,2,3,8	Successful solving of appropriate problems during in-class discussions, homework and exams.
Students will demonstrate conceptual and practical understanding of the physics behind the Sun, Planets, minor bodies, and the Interplanetary Medium.	- Same as above	1,2,3,8	Successful completion of in-class exam essay questions and solving of appropriate problems during in-class discussions, homework and exams.

Institutional Goals:

1. Students acquire an education shaped by Christian values.
2. Students are equipped for successful careers and post-graduate education.
3. Students acquire an enthusiasm for lifelong learning through expanded intellectual and cultural experiences.
8. The institution will engage in an ongoing pursuit of excellence in curricula, programs, and policies.