

Syllabus ENVI / PHYS 360 (S13)

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Office Hours: MWF 10:00 – 11:00 am, and by appointment.

Class Time: MWF 11:00 am – 11:50 am, Location: S-022.

PREREQUISITES

There are no prerequisites for this class. However, since this is a 300-level class, you should have satisfied your Basic Studies Math and English requirements. Algebra will be used in class and you will be expected to write at the level of a college junior.

Texts

Thomas T. Arny, Explorations: An Introduction to Astronomy 6th ed. **ISBN-13:** 978-0073512174
Additional readings will be assigned throughout the semester, drawn from research journals, in astronomy, economics, public policy and so on, as well as online sources, newspapers, and pop culture.

Students are expected to access online resources/interactive/animations in the Student Edition of the textbook website at: http://paris.mcgraw-hill.com/sites/0073512176/information_center_view0/ or http://paris.mcgraw-hill.com/sites/0073512176/student_view0/index.html

Stellarium

For this class you will need to use the Stellarium software that can be downloaded FREE from <http://www.stellarium.org/>. If you run the program, and the text does not display correctly, try opening it from your “Start” menu using the (no OpenGL2) option. If you still have problems with the software, let me know. The first time you run Stellarium, you should change the default location to Terre Haute, United States. After starting Stellarium, pressing F6 will open a Location window where you can change the location to Terre Haute. Save this as your default.

Foundational Studies Program Objectives (PO)

The following FS Program Objectives are addressed in this course:

1. **Locate, critically read, and evaluate information to solve problems:** Problem solving is central to much of what we know in astronomy. Most homework assignments will require that students complete a number of problems. Students must read critically to recognize the relevant information provided and to determine what information (e.g. equations, physical constants) must be gathered from other sources to solve the problem.
2. **Critically evaluate the ideas of others:** Astronomy touches on the topics of science, science funding, and religion. Students will need to evaluate the arguments of many points of view.
3. **Apply knowledge and skills within and across the fundamental ways of knowing:** Students will need to apply knowledge of mathematics, computer simulation software, hands-on experimental methods, history, religion, and science in their reading, homework and writing assignments..
6. **Demonstrate an understanding of diverse cultures within and across societies:** Astronomy has a long and multicultural history.
7. **Demonstrate the skills to place their current and local experience in a global, cultural, and historical context:** A great deal of time in the course is devoted to the historical context of the astronomical knowledge gained.
10. **Express themselves effectively, professionally, and persuasively both orally and in writing:** Astronomy students will complete two major writing assignments which are both persuasive in nature. Additional writing experience will be gained during the “Min-Labs.”

See the General Education Website for a full listing of the 10 Learning Outcomes for Foundational Studies:
<http://www.indstate.edu/gened/>

Upper Division Integrative Elective Learning Objectives (LO)

1. **Use a thematic approach to a particular topic or issue that integrates multiple ways of knowing**
2. **Engage in a project or conduct research that makes use of multiple ways of knowing to address a particular topic or issue**
3. **Analyze and write at an advanced level**

All three of the Learning Objectives are addressed by this course. Students will learn about the universe through the use of mathematical reasoning, the reading of historical documents, and written essays. Students will also utilize free astronomical simulation software (Stellarium) to develop an understanding of the planets, stars, and the constellations. Students will write an essay arguing for and against sending humans to Mars, and present those arguments in a larger context, demonstrating the application of multiple ways of knowing to the issue, and utilizing references across those ways of knowing (VI. Laboratory Science, VII Social and Behavioral Sciences, X. Historical Studies, XI Global Perspectives and Cultural Diversity). On a regular basis the class will make use of articles from research journals across disciplines, use those same journals as references in the assigned papers, and those articles will be used as topics for essay questions on the tests.

Skill and Applied Learning Requirements (SALR)

1. **Develop critical thinking skills:** The course mixes scientific and mathematical concepts in problems, in addition to the writing assignments and Mini-Labs.
2. **Develop information literacy skills:** Students will need to provide relevant references for the writing assignments and provide an assessment of the reliability of those sources.
3. **Include a graded writing component:** Two graded essay assignments are required by the course. Exams will include short answer and essay questions. Additional writing will be completed as part of the Mini-Labs.
4. **Students critically read and analyze sophisticated text:** Students will need to read and assess relevant scientific texts in both of the writing assignments for this course.
5. **Include assignments applying various “ways of knowing:”** Students will need to apply knowledge of mathematics, computer simulation software, hands-on experimental methods, history, religion, and science in their reading, homework and writing assignments.

Academic Honesty

I cannot give you credit for work that is not your own. Plagiarism and other forms of cheating will not be tolerated. Depending on the nature of the assignment and the seriousness of the offense, penalties range from no credit given for the assignment to a failing grade in the course to suspension or expulsion as determined by Student Judicial Programs. Consult a copy of The Code of Student Conduct for more information about the University’s policy on academic integrity. The Student Guide to Academic Dishonesty can be found at:

<http://web.indstate.edu/academicintegrity/studentguide.pdf>

American with Disabilities Act Statement

“Indiana State University seeks to provide effective services and accommodation for qualified individuals with documented disabilities. If you need an accommodation because of a documented disability, you are required to register with Disability Support Services at the beginning of the semester. Contact the Director of Student Support Services. The telephone number is 237-2301 and the office is located in Gillum Hall, Room 202A. The Director will ensure that you receive all the additional help that Indiana State offers. If you will require assistance during an emergency evacuation, notify your instructor immediately. Look for evacuation procedures posted in your classrooms.”

Cell Phone and Laptop Usage Policy

The use of cell phones, beepers, or other communication devices is disruptive, and is therefore prohibited during class (e.g., no texting). If there is an emergency where you may need to be contacted during class, please make me aware of the situation before class begins.

Laptop Usage

Laptop Usage Forbidden: While the University has chosen to require laptops of its students, the University also recognizes and respects the right of faculty to conduct their classes as they deem appropriate. In this course, no laptop may be used in class. Failure to comply with this direction is a violation of the Code of Student Conduct.”

Academic Freedom

"Teachers are entitled to freedom in the classroom in discussing their subject, but they should be careful not to introduce into their teaching controversial matter which has no relation to their subject."

The preceding comes from the American Association of University Professors statement on academic freedom. Though the entire statement speaks to many issues, it is this portion on the conduct of the course that is most relevant. For the purpose of Foundational Studies courses this means that faculty have the right to conduct their class in a fashion they deem appropriate as long as the material presented meets the learning objectives laid out by the entire faculty. See: <http://www.aaup.org/AAUP/pubsres/policydocs/contents/1940statement.htm>

Course Format

Most class days will follow a regular lecture format. You should complete the reading assignments in preparation for lecture and discussion. Some days will be devoted to in class hands on activities (Mini-Labs) and the writing of a short report about those activities.

Attendance

Attendance is not monitored as part of your grade, but much of the reading will be placed in context by the lecture, and the emphasis of material expected on exams will be reflected by the lecture material. In addition, questions that appear on the quizzes might be mentioned specifically. **You are responsible for all announcements and information provided to the class, both written and oral, including days you are absent.**

Online Quizzes

Questions covering each chapter are in a QUIZZES folder in the course Blackboard site. The questions have been taken from the quizzes found on the textbook student website at

http://paris.mcgraw-hill.com/sites/0073512176/information_center_view0/ (Student Edition) or
http://paris.mcgraw-hill.com/sites/0073512176/student_view0/index.html.

You are STRONGLY encouraged to complete the textbook web version quizzes (can be taken as many times as you like and do not count towards your grade; i.e., **DO NOT SUBMIT TO ME**) to prepare for the Blackboard quiz, which may be taken only one time and which counts towards your grade. Quizzes over chapter material will be available only until the material has been covered in class. Keep up with the reading assignments. Noon on **the first scheduled day of lecture for the next chapter or next Test or final Review will be the deadline for the quizzes.** After that you will no longer be able to complete the quizzes over the prior material. **NO LATE QUIZZES WILL BE ACCEPTED.** Each quiz is worth 10 points and the two lowest quiz grades will be dropped. **THE LAST TWO QUIZZES MAY NOT BE DROPPED.** Students needing help with Blackboard should call the Help Desk at x7941.

DO NOT TAKE THE QUIZZES FROM MYISU, OR YOU WILL TIME-OUT IN BLACKBOARD. LOG IN DIRECTLY TO BLACKBOARD TO TAKE THE QUIZZES.

Mini-Lab Activity Reports

On occasion, we will spend a class period with hands-on activities. **At the start of the next class period,** a report will be due regarding your observations during the activities. Each Mini-Lab is worth 20 points and the lowest Mini-lab score will be dropped. **NO LATE REPORTS WILL BE ACCEPTED.**

Stellarium Assignments

Details below. Each assignment, except assignment VII is worth 10 points. The two lowest Stellarium scores will be dropped. **THE LAST TWO ASSIGNMENTS MAY NOT BE DROPPED.** Assignment VII is worth **30 points.** Assignment 8 is worth **20 points.** **NO LATE ASSIGNMENTS WILL BE ACCEPTED.**

Writing Assignments

Two term papers will be assigned for the semester. Each is graded on a scale of 25 points. Each assignment is to be between 3 and 4 pages in length, typed, double spaced, New Times Roman 12 point font. The details of the topics to be addressed in the papers are below, but the first topic will be an historical topic, and one will be a scientific topic. Papers that are found to be below acceptable standard (a score of 15 or lower) will be returned to the student for re-submission. **The student will be required to DOCUMENT a visit to the writing center** and THEN re-write and re-submitted the assignment no later than the second class meeting after the return of the assignment (regardless of absences). The grade for the assignment will be the **average of the two grades** on the assignment. If you score above 15 on your original submission, then your second score is automatically 25. The revised version should be turned in with the graded copy of the original paper. If you do not turn in a required REVISION of a paper, then the second score is ZERO. Items noted in the first version, and not fixed for the revision will cost twice the original amount. **NO LATE PAPERS WILL BE ACCEPTED.**

Tests

Three tests will be given in class during the semester, and a final examination at the end of the semester. Each test is worth 200 points, and the lowest score will be dropped. Tests are listed in the assignments below. **NO MAKEUP TESTS WILL BE GIVEN.**

Grading

For all problems requiring you to show your work, a numerical answer by itself will receive **NO CREDIT**. The method of solution must be shown, and it must be correct. Partial credit will be given for work shown. No work is needed for the multiple choice or short answer portions of the tests.

Course Grade

The final grade for the course will be based on the following set of possible total points..

Quizzes (15)	150
Mini-Labs (3)	60
Stellarium (7)	90
Papers (2)	100
Tests	<u>600</u>
Total	1000

Grading Scale

A ⁺ 99-1000	A 940-970	A ⁻ 900-930
B ⁺ 870-890	B 840-860	B ⁻ 800-830
C ⁺ 770-790	C 740-706	C ⁻ 700-730
D ⁺ 670-690	D 640-660	D ⁻ 600-630
F Below 600		

Topics and Schedule for ENVI / PHYS 360: General Astronomy

Jan. 7	Introduction		
Jan. 9	Chapter 1: History of Astronomy		
Jan. 11	Chapter 2: The Rise of Astronomy	Q1	
Jan. 14	Stellarium Introduction		
Jan. 16, 18	Chapter 3: Gravity and Motion	Q2	
Jan. 21	MLK DAY		
Jan. 23	Chapter 5: Telescopes	Q3	
Jan. 25	Chapter 5: Telescopes		Stellarium I Constellation Columba due.
Jan. 28	Lenses and Telescope Mini-Lab		
Jan. 30	Chapter 6: The Earth	Q5	Essay I Due
Feb. 1	Chapter 6: The Earth		
Feb. 4	Chapter 7: The Moon	Q6	
Feb. 6	Chapter 7: The Moon		Stellarium II The Moon due.
Feb. 8	TEST I: HISTORY, THE EARTH AND THE MOON		Q7
Feb. 11, 13	Chapter 8: Survey of the Solar System		
Feb. 15, 18	Chapter 9: The Terrestrial Planets	Q8	
Feb. 20	Mars Mini-Lab		
Feb. 22	Chapter 10: The Outer Planets		Stellarium III An Inner Planet due Q9
Feb. 25	Chapter 10: The Outer Planets		
Feb. 27	Chapter 11: Asteroids, and Comets		Stellarium IV An Outer Planet due
March 1	TEST II THE SOLAR SYSTEM		Q11
March 4, 6	Chapter 12: The Sun, Our Star		
March 8	Spectral Tubes (diffraction gratings) Mini-Lab		Stellarium V The Sun due.
March 11 – March 15	SPRING BREAK		
March 17 (Sunday)	LAST DAY TO DROP CLASSES.		
March 18, 20, 22	Chapter 13: Measuring the Properties of Stars		Q12

March 22 **BONUS POINTS: Out of class Mini-Lab:** Estimate the diameter of the Sun, using a ruler, a sheet of paper and a pencil (see textbook page 335). You need to show all of your data and your work. YOU ONLY NEED TO DO PART 1 OF THE ITMES LISTED ON THAT PAGE.

March 25 Parallax Mini-Lab Stellarium VI Parallax Stars

March 27, 29, April 1 Chapter 14: Stellar Evolution Q13

**April 1 Stellarium VII Star Clusters and Constellations
WORTH 3 ASSIGNMENTS!! Prepare for and use HR diagram on exam.**

April 3 TEST III THE PROPERTIES OF STARS Q14

April 5 Chapter. 15: Stellar Remnants: White dwarfs, neutron stars, and Black Holes

April 8 Chapter. 15: Stellar Remnants Essay II Due

April 10, 12, 15 Chapter 16: The Milky Way Q15

April 17 Chapter 17: Galaxies Q16

April 19 Chapter 17: Galaxies Stellarium VIII Galaxies.

April 22, 24 Chapter 18 and Essay Four: Cosmology and Life in the Universe Q17

April 26 Review for final (or catch up) Q18

April 26 Stellarium IX Stars with Planets (other than the Sun).

May 3 **FRIDAY!! 10 AM FINAL EXAM: THE BIG PICTURE**

Mini-Labs

Jan. 28 Lenses (telescopes)

Feb. 20 Mars Map

March 8 Spectral tubes (diffraction gratings)

March 25 Parallax or “Triangulation”

Essays

Jan. 30 Essay I

April 8 Essay II