

Course Syllabus
PHYS 1411, ASTRONOMY AND THE UNIVERSE
Spring Semester, 2013-14
Physics Department, Dr. Ernest Pyle, Department Chair

COURSE DESCRIPTION

Designed for non-science majors, this course is an overview of the solar system, astronomical instruments, the origin and evolution of stars, galaxies, black holes, quasars, cosmology, and the structure and origin of the universe. Concepts and critical thinking are strongly emphasized. The course includes one semester hour credit for laboratory investigations consisting of computer work and observation sessions.

COURSE SEQUENCE IN CURRICULUM

This is a course suitable for non-science majors with no background in physics. It is not a prerequisite for any other course.

PRE-REQUISITE INFORMATION

MATH 1313 or higher

INSTRUCTOR INFORMATION

Name: Dr. James Claycomb
E-mail: jclaycomb@hbu.edu
Office Phone: 281-649-3190
Office Location: S216
Office Hours: TBA, After Class
Web Page Address: Blackboard

LEARNING RESOURCES

Course Text: Theo Koupelis, In Quest of the Universe, 6th ed., Jones and Bartlett Learning ISBN-13: 9780763768584
Laboratory Text: None
Supplementary Text: <http://physicalscience.jbpub.com/starlinks/>
Other Required Materials: You will need to have a non-programmable scientific calculator (with square root key, trigonometric and exponential functions). It should be brought to all classes, labs, quizzes, tests, and exams. Be sure you know how to operate your own calculator.

COURSE OBJECTIVES

Purpose of the course:

To provide the student with a general working knowledge of the physical processes and phenomena in the Solar System and Universe. Emphasis is placed on recent theories and discoveries.

Aims for the course:

To provide an overview of the Solar System, astronomical instruments, the origin and evolution of stars, galaxies, black holes, quasars, cosmology, and the structure and origin of the Universe.

On completion of this course, students should be able to:

Demonstrate a general working knowledge of the physical processes and phenomena in the solar system and universe.

RELATION TO DEPARTMENTAL GOALS AND PURPOSES

The Mathematics/Physics Department "...will offer an academically rigorous, undergraduate curriculum in classical and modern mathematics. The curriculum will prepare students majoring in mathematics and mathematical studies for careers and further education in mathematics and will encourage a lifetime of learning."

"...will provide academically rigorous and modern courses in mathematics to support other programs at the University."

"...will offer courses to enable all graduates of the University to become mathematically literate and develop useful skills in mathematics."

"...will provide the appropriate administrative processes, facilities, research experiences, and faculty to achieve the goals stated above."

RELATION TO COLLEGE GOALS AND PURPOSES

"...to prepare students for careers and further education in the natural sciences and mathematics in a nurturing Christian environment. The College will also serve the HBU community by providing science and mathematics classes that empower HBU students to meet the goals and requirements of their field of study and enrich their liberal arts education."

RELATION TO THE PURPOSE STATEMENT OF THE UNIVERSITY

University mission and purpose statement from the Houston Baptist University Catalog, 2009-2010: "...to provide a learning experience that instills in students a passion for academic, spiritual, and professional excellence as a result of our central confession, "Jesus Christ is Lord"

"...Committed to providing a responsible and intellectually stimulating environment that:

- fosters spiritual maturity, strength of character, and moral virtue as the foundation for successful living
- develops professional behaviors and personal characteristics for life-long learning and service to God and to the community
- meets the changing needs of the community and society
- remains faithful to the '**Nature of the Institution**' statement"

"...Promotes learning, scholarship, creative endeavor, and service".

ATTENDANCE

Please see the official Attendance Policy in the HBU Classroom Policy on Blackboard. Students missing more than 25% of the class will be given a failing grade.

Excused absences (personal illness, illness of dependants, death in the immediate family, or legal obligations) must be documented on the first day of returning to class.

ACADEMIC ACCOMODATIONS

Students needing learning accommodations should inform the professor immediately and consult the Academic Accommodations section of the HBU Classroom Policy posted on Blackboard.

COURSE REQUIREMENTS & GRADE SCALE

Course requirements:

Three examinations and a comprehensive final comprise the bulk of the grade. Laboratory reports are required. Homework sets and essay assignments are given. Students work on projects to be presented to the class.

Grading standards:

Course grading is as follows:

Four Exams (10% each)	40%
Attendance, Participation, Quizzes	10%
Homework	10%
Laboratory Work	20%
Comprehensive Final Exam	20%

The grading scale is:

A = 90 – 100; B = 80 – 89; C = 70 – 79; D = 60 – 69; F = Below 60

PROFICIENCIES:

Technology component:

Instructors may, at their discretion, choose to utilize internet assignments.

Designated essay/writing component:

The students are required to write essays on recent theories or discoveries.

Reading component:

The students are expected to read and understand the textbook. Use of the internet may be required for the essays, thus the ability to read and make the distinction of pertinent material is imperative.

Oral communication component:

The students are encouraged to ask questions in class. During the question/answer portion of the class period, the students are required to defend their viewpoints with coherent arguments. In the laboratory, students are encouraged to join in discussions with other students.

Mathematics component:

The students are expected to do low-level math calculations and algebraic manipulations.

Critical thinking component:

In examinations, the students are expected to apply concepts learned by solving conceptual and quantitative problems.

LATE WORK & TEST POLICY

Late work:

Each assignment is to be turned in at the start of the class on the day that it is due. No late work will be accepted unless there are documented extenuating circumstances.

Missed tests:

No make-up exams will be given. Any student missing an exam will receive a zero (0) for that exam. Any student missing the final exam will receive an "F" for their final grade in the course.

EVALUATION

Method of student appraisal of faculty:

Students will be given an opportunity to appraise the professor by completing the IDEA Faculty Evaluation Questionnaire, and/or the COSM course evaluation at the end of the semester. The instructor, the department chairman and dean will review the responses of the students after the completion of the course.

Method of evaluating student response to course:

Students will be given an opportunity to describe their response to the course by completing the IDEA Faculty Evaluation Questionnaire and/or the COSM course Evaluation at the end of the course. The instructor, the department chairman and dean will review the responses of the students after the completion of the course.

LABORATORY DRESS CODE

Students may be asked in advance to wear closed-toed shoes and long pants during certain experimental procedures.

LABORATORY CONDUCT AND SAFETY

Never view the sun through any optical instrument without the proper filter.

TOPICAL OUTLINE - *include table, calendar, or topical outline with dates*

Topics Covered:

Chapters 1 – 19: In Quest of the Universe

Tentative Schedule:

Week	Topics	Reading
1	The Quest Ahead	Chapter 1
1	From an Earth-Centered Universe to a Sun-Centered System	Chapter 2
2	Gravity and the Rise of Modern Astronomy	Chapter 3
3	Light and the Electromagnetic Spectrum	Chapter 4
4	Telescopes: Windows to the Universe	Chapter 5
5	The Earth-Moon System	Chapter 6
6	A Planetary Overview	Chapter 7
7	The Terrestrial Planets	Chapter 8

8	The Jovian Planets	Chapter 9
9	Dwarf Planets and Solar System Debris	Chapter 10
9	The Sun	Chapter 11
11	Measuring the Properties of Stars	Chapter 12
11	Interstellar Matter and Star Formation	Chapter 13
12	The Lives and Deaths of Low-Mass Stars	Chapter 14
12	The Deaths of Massive Stars	Chapter 15
13	The Milky Way Galaxy	Chapter 16
14	A Diversity of Galaxies	Chapter 17
14	Cosmology: The Nature of the Universe	Chapter 18
15	The Quest for Extraterrestrial Intelligence	Chapter 19

Tentative Schedule:

WEEK	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
1	01/20 Ch 1	01/21	01/22 Ch 1	01/23	01/24 Ch 2
2	01/27 Ch 2	01/28	01/29 Ch 2	01/30	01/31 Ch 3
3	02/03	02/04	02/05 Ch 3	02/06	02/07 Test 1 Ch 1 – Ch 3
4	02/10 Ch 4	02/11	02/12 Ch 4	02/13	02/14 Ch 4
5	02/17 Ch 5	02/18	02/19 Ch 5	02/20	02/21 Ch 6
6	02/24 Ch 6	02/25	02/26 Ch 7	02/27	02/28 Ch 7
7	03/03 Ch 8	03/04	03/05 Ch 8	03/06	03/07 Test 2 Ch 4-8
8	03/10 Ch 9	03/11	03/12 Ch 9	03/13	03/14 Ch 9
9	03/17 Ch 10	03/18	03/19 Ch 11	03/20	03/21 Ch 11
10	03/24 Spring Break	03/25	03/26 Spring Break	03/27	03/28 Spring Break
11	03/31 Ch 12	04/01	04/02 Test 3 Ch 9-12	04/03	04/04 Last Day to Drop with 'W' Ch 13
12	04/07 Ch 14	04/08	04/09 Ch 14	04/10	04/11
13	04/14 Ch 15	04/15	04/16 Ch 16	04/17	04/18 Ch 16

14	04/21 Ch 17	04/22	04/23 Ch 18	04/24	04/25
15	04/28 Ch 18	04/29	04/30 Ch 18	05/01	05/02 Ch 19
16	05/05 Test 4 Ch 13-19	05/06	05/07 Review	05/08	05/09 Last day of classes
17	05/12 Reading Day	05/13 Finals	05/14 Finals	05/15 Finals	05/16 Finals

Laboratory Outline:

A student must have a passing grade in the laboratory to pass the course. All labs must be completed.

Weeks	Laboratory (Observations in all labs when weather permits)
1-2	Motions of the Earth and Moon: Rotations, Orbits, and Phases
3-4	Telescopes, Observations
5-6	Spectra, Weighing the Earth
7-8	The Solar System, Nebula
9-10	Constellations and Stellar Spectra
11-12	Stellar Parallax, Pulsars and Cepheid
13-14	Black Holes, Inflationary Cosmology
15	Discussion - Extraterrestrial Life: Are we alone?

The content of this outline and the attached schedule are subject to change at the discretion of the professor.

Student Signature – I have read and understand the syllabus for this class. I understand that the content of this syllabus and the topical outline are subject to change at the discretion of the professor. I have read and understand the HBU Classroom Policy posted on Black Board. **I promise to uphold the Code of Academic Integrity at Houston Baptist University and will not tolerate its violation by others.**