UC 123641 3F

CBM003 ADD/CHANGE FORM

☒ Undergraduate Council	or	Graduate/Professional Studies Council
☐ New Course ☒ Course Change		☐ New Course ☐ Course Change
Core Category: Life/Phys Sci Effective Fall ~~2013~~ 2014		Effective Fall ~~2013~~

APPROVED OCT 02 2013

RECEIVED AUG 22 2013

1. Department: Physics College: NSM
2. Faculty Contact Person: Donna Stokes Telephone: 3-3588 Email: dstokes@uh.edu
3. Course Information on New/Revised course:
   - Instructional Area / Course Number / Long Course Title:
     PHYS / 1305 / Introductory Astronomy - The Solar System
   - Instructional Area / Course Number / Short Course Title (30 characters max.)
     PHYS / 1305 / INTRO.ASTRONOMY THE SOLAR SYST
   - SCH: 3.00 Level: FR CIP Code: 40.0801.00 Lect Hrs: 3 Lab Hrs: 0
4. Justification for adding/changing course: **To meet core curriculum requirements**
5. Was the proposed/revised course previously offered as a special topics course? ☐ Yes ☒ No
   If Yes, please complete:
   - Instructional Area / Course Number / Long Course Title:
     ____ / ____ / _____
   - Course ID: _____ Effective Date (currently active row): _____
6. Authorized Degree Program(s): BA/BS
   - Does this course affect major/minor requirements in the College/Department? ☐ Yes ☒ No
   - Does this course affect major/minor requirements in other Colleges/Departments? ☐ Yes ☒ No
   - Can the course be repeated for credit? ☐ Yes ☒ No (if yes, include in course description)
7. Grade Option: Letter (A, B, C ...) Instruction Type: lecture ONLY (Note: Lect/Lab info. must match item 3, above.)
8. If this form involves a change to an existing course, please obtain the following information from the course inventory: Instructional Area / Course Number / Long Course Title
   PHYS / 1305 / Introductory Astronomy - The Solar System
   - Course ID: _____ Effective Date (currently active row): _____
9. Proposed Catalog Description: (If there are no prerequisites, type in "none".)
   Cr: 3. (3-0). Prerequisites: credit for or concurrent enrollment in MATH 1310 or 1311. Description (30 words max.): Introduction to history and development of astronomy from pre-Greek times through the modern eras. Keller's laws, Newton's laws, recent experimental results from planetary and interplanetary probes, origin and evolution theories for the solar system. May not apply to course or gpa requirements for a major or minor in natural sciences and mathematics.
10. Dean's Signature: _____ Date: 9/9/13
    Print/Type Name: _____

REQUEST FOR COURSES IN THE CORE CURRICULUM

Originating Department or College: Physics/NSM

Person Making Request: Donna Stokes Telephone: 713-743-3588

Email: dstokes@uh.edu

Dean's Signatur: Date: Click here to enter text.

Course Number and Title: Phys 1305 Introductory Astronomy – The Solar Systems

Please attach in separate documents:

X Completed CBM003 Add/Change Form with Catalog Description

X Syllabus

List the student learning outcomes for the course (Statements of what students will know and be able to do as a result of taking this course. See appended hints for constructing these statements):

Upon completion of this course, students will be able to (1) understand the origin and structure of the solar system including the sun, planets and other solar system bodies, (2) understand and apply the fundamental principles of celestial body interactions (3) solve elementary problems in motion, time, size and mass of the solar system and its components, (4) communicate orally and in writing information on the structure and origin of our solar system and its components.

Component Area for which the course is being proposed (check one):

***Note:** If you check the Component Area Option, you would need to also check a Foundational Component Area.

☐ Communication ☐ American History

☐ Mathematics ☐ Government/Political Science

☐ Language, Philosophy, & Culture ☐ Social & Behavioral Science

☐ Creative Arts ☐ Component Area Option

X Life & Physical Sciences

Competency areas addressed by the course (refer to appended chart for competencies that are required and optional in each component area):

X Critical Thinking X Teamwork

X Communication Skills ☐ Social Responsibility

X Empirical & Quantitative Skills ☐ Personal Responsibility

Because we will be assessing student learning outcomes across multiple core courses, assessments assigned in your course must include assessments of the core competencies. For each competency checked above, indicated the specific course assignment(s) which, when completed by students, will provide evidence of the competency. Provide detailed information, such as copies of the paper or project assignment, copies of individual test items, etc. A single assignment may be used to provide data for multiple competencies.

Critical Thinking:

Problems/questions which require critical thinking skills will be included in homework assignments and will also be presented and solved in class. Homework assignments are assigned weekly with feedback given in the form of gradded assignments. Problems/questions which require critical thinking skills will be included on excaminations for the course. Sample homework problems and sample exam questions/problems are attached.

Communication Skills:

Communication skills are assessed through student participation in class discussions on astro-physical topics. Students are split into subgroups each of which 'score' effectiveness of the others to explain a given topic. Scoring sheets will be developed and supplied to the groups. Approximately 10 groups are represented, and scores are collected and an assessment of effectiveness extracted by the instructor.

Empirical & Quantitative Skills:

Empirical and quantitative skills are assessed through evaluation and discussion of answers to assigned problems and answes to ezam questions/problems.

Teamwork:

Peer instruction using personal response devices (clickers) will be used to administer concept tests consisting of 2-3 short multiple-choice conceptual questions will be used to assess teamwork. Concept questions are asked to the class as a whole and each student choses an answer. The students are encouraged to share their opinions on the problem with their peers in small groups of 2-3 people. Each student is allowed the opportunity to explain their answer and engage in discussion if their answers are different. The question is asked a second time and students select their answer. The correct answer is revealed and a distribution of the solutions chosen is shown. This allows the instructor as well as the student the opportunity to see where misconceptions may be occurring, how the student grasp the concepts and how well the student work together.

Social Responsibility:

Personal Responsibility:

Click here to enter text.

Will the syllabus vary across multiple section of the course? ☐ Yes X No
If yes, list the assignments that will be constant across sections:
Click here to enter text.

Inclusion in the core is contingent upon the course being offered and taught at least once every other academic year. Courses will be reviewed for renewal every 5 years.

The department understands that instructors will be expected to provide student work and to participate in university-wide assessments of student work. This could include, but may not be limited to, designing instruments such as rubrics, and scoring work by students in this or other courses. In addition, instructors of core courses may be asked to include brief assessment activities in their course.

Dept. Signature: _____

Physics 1305 Sample Homework Questions/Problems

1. Why are the rotation period and the revolution period of the Moon the same?

2. What are Kepler's three laws of planetary motion?

3. What angle with the horizon do the Sun's rays make in Winnepeg, Canada (50° north latitude) at the Autumnal Equinox?

4. From Newton's gravitational law what is the weight of a 120 lb. (on Earth) person who is standing on the surface of a planet with mass 1/1000 that of the Earth, and a diameter 1/10 that of the Earth?

5. If a large asteroid was observed with a crater density for large craters (~ 50 km) of ~ 6×10^{-7} craters/km^2, what is the age of its surface?

Physics 1305 Sample Quiz Questions/Problems

1. What are the Celestial Coordinates of an object that lies directly north of the autumnal equinox and 15° from the equator?
   a. 12 hr RA; -15° DEC
   b. 0 hr RA; -65° DEC
   c. 12 hr RA; 65° DEC
   d. 0 hr RA; 15° DEC
   e. 12 hr RA; 15° DEC

2. By using Kepler's Laws, how far away from the sun is an asteroid if its period of revolution around the sun is 8 years?
   a. 1 AU
   b. 8 AU
   c. 2 AU
   d. 4AU
   e. 22.6 AU

3. If a star with peak emission at 500nm is moving **towards** earth at a velocity 0.5 c, its peak emission would be seen at
   a. 500nm
   b. 750nm
   c. 250nm
   d. 525nm,
   e. 475nm

4. The higher number of meteor craters in the lunar highlands as compared to the lunar maria indicate
   a. the maria are now active volcanically
   b. only small meteors can penetrate the moon's atmosphere
   c. the maria are older than the highlands
   d. the maria are younger than the highlands
   e. lunar dust has filled in the maria craters

5. Which of the following correctly list atmospheric density from smallest to largest?
   a. Moon, Mercury, Mars, Earth Venus
   b. Mercury, Mars, Earth, Moon, Venus
   c. Venus, Earth, Mars, Moon, Mercury
   d. Mars, Earth, Venus, Moon, Mercury
   e. Earth, Mars, Venus, Moon, Mercury

6. The presence of a significant number of sunspots is an indication of
   a. Cooling of the sun
   b. An increase in the sun's surface temperature
   c. An increase in energy production in the core of the sun
   d. Increased energy emissions from the sun
   e. all of the above

Physics 1305
Introductory Astronomy
The Solar System

Syllabus

Spring 2013
101 SEC
Time: T, Th 2:30 – 4:00

Dr. A. Ignatiev
606 S&R 1, 713-743-3630
Office Hours: T, Th; 4:00 -5:00 p.m.
Ignatiev@UH.edu

Text: "Astronomy Today", 6th/7th ed., E. Chaisson and S. McMillan
(Prentice Hall)

Reference Texts: "Astronomy: Journey to the Cosmic Frontier", 5th/6th ed., John Fix
(McGraw-Hill)
"Foundations of Astronomy", 10th/ 11th/12th ed., Michael Seeds & Dana Bachman
(Wadsworth Publishing)

Learning Outcomes: Upon completion of this course, students will be able to:

(1) understand the origin and structure of the solar system including the sun, planets and other solar system bodies,;
(2) understand and apply the fundamental principles of celestial body interactions;
(3) solve elementary problems in motion, time, size and mass of the solar system and its components;
(4) communicate orally and in writing information on the structure and origin of our solar system and its components.

Grading:

3 Monthly Exams	45%
Teamwork Assignment	5%
Weekly Homework	10%
Comprehensive Final Exam	40%
	100%

Teamwork Component: Concept test will be administered during lecture for each chapter. Answers for the concept tests will be submitted using a personal remote system (clicker). Students will discuss these questions in teams of 2-3 students as a method of peer instruction. Each clicker costs $40 plus tax. For the detailed Clicker purchasing information, please contact

Barnes & Noble in the UC
4800 Calhoun Rd.
126 University Center
Houston, TX 77204
Phone: 713-748-0923

NOTE: You can use your book loan to buy a clicker through the bookstore. **See Blackboard for clicker registration instructions.**

Schedule:

Jan 15 - Feb 14 — Chap. 1 – 5

Learning Outcomes:
i.) vastness of universe
ii.) coordinates of the universe
iii.) history of astronomy
iv.) what is electromagnetic radiation
v.) how do we explore the universe/solar system
vi.) optical and radio telescopes

Jan 30 — ***Last day to drop with no grade***

Feb 19 — **Exam 1**

Feb 21 - Mar 21 — Chap. 6-10

Learning Outcomes:
i.) formation of the solar system
ii.) the structure of the Earth
iii.) Earth's atmosphere and it origin
iv.) the changing Earth crust
v.) origin & structure of the Moon
vi.) origin and structure of Mercury
vii.) origin and structure of Venus
viii.) origin and structure of Mars

Mar 11 - 16 — ***Spring Break***

Mar 26 — **Exam 2**

Mar 27 — ***Last day to drop (with a grade)***

Mar 28 - Apr 18 — Chap. 11-16

Learning Outcomes:
i.) origin and structure of Jupiter
ii.) origin and structure of Saturn
iii.) origin and structure of Uranus
iv.) origin and structure of Neptune
v.) origin and structure of solar system moons
vi.) origin and structure of comets
vii.) origin and structure of meteors
viii.) origin and structure of the Sun
ix.) stars in the universe
x.) life in the universe

Apr 23 — **Exam 3**

April 25 — Review Day (last day of Class)

May 7, 2:00pm – 5:00pm — ***Final Exam***