

HOUSTON COMMUNITY COLLEGE

COURSE SYLLABUS FOR ASTR 1304 Introduction to Solar System Astronomy

Spring 2018 Class Number 54702

Discipline/Program

Physics

Course Level First Year (Freshman)

DE Course

Course Semester Credit Hours (SCH) (lecture, lab) 4 (3 lecture, 1 lab)

Total Course Contact Hours 96

Course Length (number of weeks) 16

Type of Instruction

Fully Online

Instructor contact information (phone number and email address)

Ayorinde Idowu

Office Phone: 281-989-2208 E-mail: Ayorinde.idowu@hccs.edu; Use Canvas e-mail system

Course Description:

Study of the sun and its solar system, including its origin. May or may not include a laboratory. (Cross- listed as PHYS 1404, 1304, & 1104)

HCC Catalog Description

An introduction to present theories about the structure and evolution of the solar system, compared to other models and theories since antiquity. A survey of the Sun, planets, moons, rings, asteroids, comets and debris in our solar system. The possibility of life in the Universe.

Course Prerequisite(s)

Must be placed into GUST 0341 (or higher) in reading and placed into MATH 0308 (or higher).
Core curriculum course Credit: 4 (3 lecture, 1 lab) Academic Discipline Program Learning Outcomes 1. Program SLO #1:

1. Demonstrate understanding of the fundamental concepts of Astronomy; Demonstrate understanding of the fundamental principles underlying astronomy including concepts and methods of inquiry at an appropriate level. Topics include, but are not limited to, the Scientific Method, The workings of the Solar System, Properties (evolution) of Stars and Galaxies.

2. Program SLO #2:

Solve conceptual and numerical problems in Astronomy; Solve conceptual and numerical problems through the recognition of the type of problem at hand, analysis of relevant information, proper application of concepts and techniques applying mathematical tools at an appropriate level. Students should demonstrate improvement in problem solving skills as they progress through courses in the program.

3. Program SLO #3

Demonstrate appropriate laboratory skills; Demonstrate appropriate laboratory skills including proper use of basic measuring devices, interpretation of laboratory directions and analysis of data obtained using appropriate tools, such as graphical/tabular methods using computers.

4. Program SLO #4

Develop interpersonal communication skills; Demonstrate an ability to work independently and/or as part of a team through participation in laboratory activities as well as assigned projects.

Course Student Learning Outcomes (SLO)

Upon successful completion of this course the student should be able to:

1. Develop an appreciation for the nature of science and the scientific method. 2. Demonstrate an understanding of the modern theories about the origins, structure and evolution of the solar system. 3. Understand properties of planets, and their moons. 4. Apply the scientific method to the study of the universe, and in varying degrees, to the student's own interest and particular field of work or study.

Learning Objectives (Numbering system linked to SLO)

Upon completion of this course the student should be able to:

1.1 Compare and contrast the size of the planet Earth to the size of the solar system and the Milky Way Galaxy. 1.2 Distinguish among astronomical unit, light year and parsec. 1.3 Name a few of the constellations, and relate brightness of stars to their size and distance. 1.4 Describe the cycles of the moon and state the conditions for solar and lunar eclipses. 2.1 Explain the difference between heliocentric and geocentric models of the universe. 3.1 Demonstrate knowledge of the basic laws of physics that pertain to the study of the bodies of the solar system. 3.2 Compare and contrast the characteristics of the terrestrial planets, and demonstrate understanding of the causes of their similarities and differences. 3.3 Compare and contrast the characteristics of the jovian planets, and demonstrate understanding of the causes of their similarities and differences. 3.4 List the differences between the terrestrial and jovian planets, and of how those differences came to be. 3.5 Discuss the properties of the lesser bodies of the solar system. 4.1 Describe the current best scientific explanation of the origin of the solar system

1.2 SCANS and/or Core Curriculum Competencies

Reading, Speaking/Listening, Critical Thinking, Computer/Information Literacy

HCC Important Dates Spring Semester 2018

January 16, 2018.....Spring Semester Classes Begin

April 3.....Spring 2018 Reg. 16 Wk Last Day to withdraw

May 13.....Spring 2018 Reg. 16 Wk. semester ends

Note: Course Calendar (Tentative Schedule. May be subject to change as the semester progresses

WEEK #/ CHAPTER QUIZ/TEST

Week 1: Note (Starting 1/21/2018)

Part I – Exploring the Sky

1 - Here and Now

2 – The Sky 4 The Stars 5 The Sky and Its Motion 6 The Cycles of the Sun 7 Astronomical Influences on Earth’s Climate

Quiz 1 on Chapters 1 and 2 (Posted 1/21 – Due 1/27)

Week 2:

3 – Cycles of the Moon • The Changeable Moon • Lunar Eclipses • Solar Eclipses • Predicting Eclipses

Quiz 2 on Chapter 3 (Posted 1/28 – Due 2/3)

Week 3:

4 – The Origin of Modern Astronomy • The Roots of Astronomy • The Copernican Revolution • Planetary Motion • Galileo Galilei • Modern Astronomy

5 – Gravity • Galileo and Newton • Orbital Motion and Tides • Einstein and Relativity

Quiz 3 on Chapters 4 and 5 (Posted 2/4– Due 2/10)

Week 4:

6 – Light and Telescopes 24 Radiation Information from Space 25 Optical Telescopes 26 Special Instruments 27 Radio Telescopes 28 Modern Astronomy

Part II – The Stars

7 – Atoms and Starlight • Atoms • The Interaction of Light and Matter • Solar Spectra

Quiz 4 on Chapter 6 +7 (Posted 2/11– Due 2/17)

Week 5:

8 – The Sun • The Solar Atmosphere • Nuclear Fusion in the Sun • Solar Activity

TEST I on Chapters 1 to 7. 2/23 – 2/24, Online.

Quiz 5 on Chapter 8 (Posted 2/18– Due 2/24)

Week 6:

10 – The Origins of the Solar System • The Great Chain of Origin • A Survey of the Solar System • The Story of Planet Building • Planets Orbiting Other Stars

11 – Earth - The Standard Comparative Planetology • A Travel Guide to the Terrestrial Planets • Earth as a Planet • The Solid Earth • Earth's Atmosphere

Part IV – The Solar System Quiz 6 on Chapters 10 and 11 (Posted 2/25 – Due 3/3)

Week 7:

12 – The Moon and Mercury: Comparing Airless Worlds • The Moon • Mercury

Quiz 7 on Chapter 12 (Posted 3/4 – Due 3/10)

Week 8:

13 – Comparative Planetology of Venus and Mars • Venus • Mars • The Moons of Mars

No other assignment due to Spring Break

Week 9:

14 – Comparative Planetology of Jupiter and Saturn • A Travel Guide to the Outer Planets • Jupiter • Jupiter's Family of Moons • Saturn Moons

Quiz 8 on Chapters 13 and 14 (Posted 3/18– Due 3/24)

TEST II on Chapters 8 and 10 to 12 3/23 – 3/24, Online

Week 10 - 11:

15 –Uranus, Neptune and the Dwarf Planets • Uranus • Neptune • The Dwarf Planets

Quiz 9 on Chapters 14 and 15 (Posted 3/25– Due 3/31)

Lab 8 –Atmospheric Retention Quiz (Posted 3/25 – Due 3/31)

Week 12 -13:

16 – Meteorites, Asteroids and Comets 1.5 Meteorites, Asteroids and Meteoroids 1.6 Asteroids 1.7 Comets 1.8 Asteroid and Comet Impacts

Week 14 -15:

17 - Astrobiology: Life on Other Planets 1.9 The Nature of Life 1.10 Life in the Universe 1.11 Intelligent Life in the Universe

Quiz 10 on Chapters 16 and 17 (Posted 4/1– Due 4/7)

Week 16: Final Examination (Comprehensive) 5/4 - /5/5 Online

Instructional Methods

Distance Education – Internet Moodle will be used as the Learning Management System.

Student Assignments

Laboratory assignments will include working with a number of virtual laboratories published by the University of Nebraska (NAAP, the Nebraska Astronomy Applets Project) and available on line at <http://astro.unl.edu/naap/>.

Information about accessing the individual labs and on how to carry out the assignments has been posted on Canvas. Due dates have been posted on the schedule above, and late submissions will not be accepted. .

On the theoretical side of the course, homework sets will be posted on Eagle Online and will be available online for, also, a week's time.

Student Assessment(s)

Final Grade Formula:

The overall score is based on the following: • Two regular exams 40% • Chapter Homework/Quizzes 20% • Final Exam 40%

Instructor's Requirements

Exams and Make-up Policy

Examinations will consist of three non-cumulative regular exams (60 %) plus a comprehensive final (20%). Make-up exams will not be given, so make every effort to take the exams on their scheduled dates. In the event that you must miss a regular exam, the grade made on the final

exam will count as the grade for the missed exam (for one missed exam only), and the final course grade will be calculated accordingly. If you do not miss any of the regular exams, your lowest exam score will be replaced by your final exam score if the final exam grade is higher. The final exam will be comprehensive, i.e., it will cover all of the material from the whole semester. Also note that the final is compulsory, i.e. no student can be exempted.

Homework

During the semester homework assignments will be posted on Eagle Online on chapters covered. The average grade for homework will count toward 20% of the Final Grade. Answers to homework or exams questions copied/pasted from the textbook or Internet sources will receive no credit. Make sure you write answers in your own words. Also note that once due dates for assignments expire, they will not be reopened. So, make it a point not to miss due dates!

Program/Discipline Requirements

At the program level, the Physics Discipline strives to accomplish the Program Learning Outcomes, Student Learning Outcomes, and Learning Objectives as described above. We desire that you receive a challenging and rewarding experience in your Physics classes at HCC which will prepare you well for future physics and related science courses that you may take in the future.

HCC Grading Scale

A = 100 – 90;.....4 points per semester hour

B = 89 – 80:3 points per semester hour

C = 79 – 70:2 points per semester hour

D = 69 – 60:1 point per semester hour

59 and below = F.....0 points per semester hour FX = Fail to withdraw before the withdrawal date ... 0 points per semester hour IP (In Progress)

.....0 points per semester hour

W(Withdrawn).....0 points per semester hour I

(Incomplete).....0 points per semester hour AUD (Audit)

.....0 points per semester hour IP (In Progress) is given only in certain developmental courses. The student must re-enroll to receive credit. COM (Completed) is given in non-credit and continuing education courses. To compute grade point average (GPA),

divide the total grade points by the total number of semester hours attempted. The grades “IP,” “COM” and “I” do not affect GPA.

Instructor Grading Criteria

See the above descriptions of the exams, quizzes/homework, and final. The course grade is based on these four criteria according to the Assessment section above.

Instructional Materials

Textbook Information

Textbook The Solar System Author(s): Seeds/Backman Publisher: Cengage Learning Copyright year: © 2016 ISBN-10: 1305120760 | ISBN-13: 9781305120761

HCC Policy Statement: ADA Academic Honesty Student attendance 3-peaters Withdrawal deadline

Access Student Services Policies on their Web site: <http://hccs.edu/student-rights>

Disability Support Services (DSS) “Any student with a documented disability (e.g. physical, learning, psychiatric, vision, hearing, etc.) who needs to arrange reasonable accommodations must contact the Disability Services Office at the respective college at the beginning of each semester. Faculty are authorized to provide only the accommodations requested by the Disability Support Services Office.”

If you have any special needs or disabilities which may affect your ability to succeed in college classes or participate in any college programs or activities, please contact the DSS office for assistance. At Southwest College, contact Dr. Becky Hauri, 713-718-7909. Contact numbers for the other HCC colleges are found in the Annual Schedule of Classes, and more information is posted at the HCC web site at Disability Services.

Title IX prohibits discrimination on the basis of sex including pregnancy and parental status in educational programs and activities. If you require an accommodation due to pregnancy please contact an Abilities Services Counselor. The Director of EEO/Compliance is designated as the Title IX Coordinator and Section 504 Coordinator

Academic Dishonesty

Students are responsible for conducting themselves with honor and integrity in fulfilling course requirements. Penalties and/or disciplinary proceedings may be initiated by College System officials against a student accused of scholastic dishonesty. "Scholastic dishonesty" includes, but is not limited to, cheating on a test, plagiarism, and collusion.

"Cheating" on a test includes:

- Copying from another student's test paper;
- Using materials during a test that are not authorized by the person giving the test;
- Collaborating with another student during a test without authority;
- Knowingly using, buying, selling, stealing, transporting, or soliciting in whole or part the contents of an administered test;
- Bribing another person to obtain a test that is to be administered.

"Plagiarism" means the appropriation of another's work and the unacknowledged incorporation of that work in one's own written work offered for credit.

"Collusion" means the unauthorized collaboration with another person in preparing written work offered for credit

"Students are responsible for conducting themselves with honor and integrity in fulfilling course requirements. Disciplinary proceedings may be initiated by the college system against a student accused of scholastic dishonesty. Penalties can include a grade of "0" or "F" on the particular assignment, failure in the course, academic probation, or even dismissal from the college. Scholastic dishonesty includes, but is not limited to, cheating on a test, plagiarism, and collusion." In this class, the penalty for willful cheating on exams is a grade of F in the course. This is the standard policy of the Natural Sciences Attendance Policy As stated in the HCC Catalog, all students are expected to attend classes regularly. Students in DE courses must log into their Eagle Online class at least twice a week or they will be counted as absent. Just like an on-campus class, your regular participation is required.

Although it is the responsibility of the student to withdraw officially from a course, the professor also has the authority to block a student from accessing Eagle Online, and/or to withdraw a student for excessive absences or failure to participate regularly. DE students who do not log into their Eagle Online class before the Official Day of Record and complete their Syllabus quiz will be automatically dropped for non-attendance. Completing the DE online orientation does not count as attendance.

Policy Regarding Multiple Repeats of a Course "NOTICE: Students who repeat a course three or more times may soon face significant tuition/fee increases at HCC and other Texas public colleges and universities. If you are considering course withdrawal because you are not earning passing grades, confer with your instructor/counselor as early as possible about your study habits, reading and writing homework, test-taking skills, attendance, course participation, and opportunities for tutoring or other assistance that might be available."

Last Day for Administrative and Student Withdrawals For 16-week Fall '16 classes, this date is November 13. Any student who is contemplating withdrawing from the class is urged to see me first! You may be doing better than you think. Either way, I want to be accessible and supportive. I do not believe in "weed out" classes, and I consider you to be much more than just a name or number! Note my office hours above; if you need assistance, I'm here to help.

Policy Regarding Withdrawals ☐ Students desiring to withdraw from a class must do so by the above withdrawal date by filling out a withdrawal form at the registrar's office. After this date, instructors can no longer enter a grade of "W" for the course for any reason.

Distance Education and/or Continuing Education Policies

The Distance Education Student Handbook contains policies and procedures unique to the DE student. Students should have reviewed the handbook as part of the mandatory orientation. It is the student's responsibility to be familiar with the handbook's contents. The handbook contains valuable information, answers, and resources, such as DE contacts, policies and procedures (how to drop, attendance requirements, etc.), student services (ADA, financial aid, degree planning, etc.), course information, testing procedures, technical support, and academic calendars.

Refer to the DE Student Handbook by visiting this link:

http://de.hccs.edu/Distance_Ed/DE_Home/faculty_resources/PDFs/DE_Syllabus.pdf

Access CE Policies on their Web site: <http://hccs.edu/CE-student-guidelines>

Test Bank N/A

Scoring Rubrics Regular exams, Homework sets, and the final will consist of multiple-choice and essay type questions. These are graded in the standard manner. The regular exams will include extra questions for extra credit however, the maximum points earned on any of the tests and exam won't exceed 100. Sample Assignments N/A Sample Instructional Methods/Activities See the PowerPoint presentations on Eagle Online for an overview of the content of each chapter: EGLS3 -- Evaluation for Greater Learning Student Survey System "At Houston Community College, professors believe that thoughtful student feedback is necessary to improve teaching and learning. During a designated time, you will be asked to answer a short online survey of research-based questions related to instruction. The anonymous results of the survey will be made available to your professors and division chairs for continual improvement of instruction. Look for the survey as part of the Houston Community College Student System online near the end of the term".