PHYS 1304 Astronomy: Solar System

Department of Physical and Environmental Sciences

Summer I 2015

A. COURSE INFORMATION

Course number/section: PHYS 1304.001/101
Class meeting time: Lecture(001) MTWR 10:00-11:15am; Lab(101) MTW11:30am-1:15pm
Class location: TBA
Course Website: TBA

B. INSTRUCTOR INFORMATION

Instructor: Galina Reid
Office location: NRC 1110
Office hours: TBA
Telephone: (361)825-3685
e-mail: galina.reid@tamucc.edu
Appointments: request an appointment via e-mail

C. COURSE DESCRIPTION

Catalog Course Description
PHYS 1304 Introduction to Astronomy: Solar System is one of two courses in the introduction to astronomy sequence which emphasizes the nature of astronomical phenomena over the mathematical analysis of them. This course introduces astronomical phenomena related to the Solar System such as apparent motion of the Sun, phases of the Moon and apparent and true motion of the planets. Main focus will be on the objects comprising the Solar System: planets, their moons, asteroids, comets and trans-Neptunian bodies. A portion of the course will be dedicated to the formation and development of the Solar System and other, extrasolar planetary systems. The course also will touch the aspects of human exploration of the Solar System and the role of technology in our learning and understanding of the Solar System. This includes the history and the basics of robotic and manned spaceflights.

D. PREREQUISITES AND COREQUISITES

Co-requisite: Laboratory Safety Online Seminar (SMTE0095.W01).
You must pass this web-based course to be allowed to start astronomy labs. Log on to your Blackboard account prior to first lab to take the course. Labs are starting on first week of the semester.
Astronomy 1304 carries 3 credits. Concurrent registration in ASTR 1304.001 (lecture section) and ASTR 1304.101 (lab sections) is required. Letter grade will be awarded to you in ASTR 1304.001 only; 25% weight will be given to lab work in determining student’s final letter grade.
E. **REQUIRED TEXTBOOK(S), READINGS AND SUPPLIES**


If you are planning to take both courses in Introduction Astronomy sequence, you may consider “Foundations of Astronomy” by Michael Seeds and Dana Backmen, edition 11-13.

F. **STUDENT LEARNING OUTCOMES AND ASSESSMENT**

The objective of this course is to understand the history and development of human knowledge about the Solar System. After successfully completing this course, a student will understand the Solar System as a dynamic system that includes certain components that are constantly interacting with one another; from the Sun and planets to trans-Neptunians. Students should be able to describe how science went from describing and classifying the solar system components to the modeling of its dynamic processes. A student should recognize the technology as a key to modern understanding of the Solar System and be able to describe how technology is used to describe and model the Solar System.

By the end of the course students should be able to:

1) Name all presently known components of Solar System.

2) Recognize major solar system objects by either image or description.

3) Execute simple calculations related to orbital motion and physical properties of solar system objects.

4) Identify physical processes that shape and govern Solar System and its components.

5) Name main space missions contributed to exploration of Solar System on all four levels: fly-by, orbiting, landing, and sample return.

6) Discuss and argue the validity of methods used in Solar System exploration, such as infrared or radar imaging, spectroscopy, computer simulations, etc.

7) Use different methods such as graphs, temperature curves, phase diagrams, and topographic maps to analyze the physical conditions of a particular solar system object.

8) Make judgment on a physical condition of certain parts of Solar System in term of life sustainability.

9) Name the major contributor to the history of the development of human knowledge of the Solar System from antiquity to present time.

10) Discuss and argue the future trend in Solar System exploration and exploitation.
G. INSTRUCTIONAL METHODS AND ACTIVITIES

This course has a large online component. It is designed in such way that students could complete 50% of assignments on their own time. All lecture presentations, homeworks, exams, and course projects would be posted on the course Blackboard page. It is essential to keep current with the Blackboard announcements. However, students must attend every lab; only a few of the lab assignments will be online.

To evaluate student’s performance three exams will be given online; and weekly homeworks will be assigned for online completion. Each exam will have: a number of problems that require 1-2 steps calculation for either deriving a numerical answer or an informative conclusion from a given situation; a number of multiple choice questions that will address student’s critical thinking; a short essay that requires from a student to communicate the ideas or concepts discussed in lectures and labs.

Each Exam and Homework is 100 points. Homeworks will have a practice component where students could master required skills before submitting their work for grading; students are given 4 attempts per homework and the best grade goes on the record. Students are strongly encouraged to use all four attempts as a practice (it is recommended to print or electronically save all of the attempts). Homeworks are not timed and a student can work on each homework as long as necessary but not passed the assigned due date; the dates when each Homework is available and due are listed below.

Student must complete a course project consisting of a three parts report on a research of a solar system object from the list posted on the course Blackboard page. The report will be a product of team collaboration where each team members is responsible for the outcome and the performance of each team member is the subject to a peer evaluation.

The laboratory component includes exercises where students apply gained knowledge and master their skill in collecting and analysis the data. Laboratory includes two night observations, one unaided and one telescopic. The dates and times of observations (and alternatives) are listed below. Each exercise and observation will have a numerical grade out of 100 points and the average will be counted as 30% of the overall course grade.

H. MAJOR COURSE REQUIREMENTS AND GRADING

Breakdown of the course grading:

a. Average of three Exams 30%

b. Average of five Homeworks 30%

c. Average of Lab Exercises 35%

d. Course project 10%

Total 100%

Final grading will be as follows: A = 90–100%, B = 80-90%, C = 70–80%, D = 60-70%, F < 60%.
Homework Dates
Submissions that are more than one day late will not be excepted

<table>
<thead>
<tr>
<th>Homework 1</th>
<th>Homework 2</th>
<th>Homework 3</th>
<th>Homework 4</th>
<th>Homework 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open: 6/1@12am</td>
<td>Open: 6/8@12am</td>
<td>Open: 6/15@12am</td>
<td>Open: 6/22@12am</td>
<td>Open: 6/29@12am</td>
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<tr>
<td>Due: 6/7@11:59pm</td>
<td>Due: 6/14@11:30pm</td>
<td>Due: 6/21@11:30pm</td>
<td>Due: 6/28@11:30pm</td>
<td>Due: 7/2@11:30pm</td>
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<td>Closed: 6/11@11:59pm</td>
<td>Closed: 6/14@11:30pm</td>
<td>Closed: 6/25@11:30pm</td>
<td>Closed: 7/2@11:30pm</td>
<td>Closed: 7/2@11:30pm</td>
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</tbody>
</table>

I. COURSE CONTENT/SCHEDULE

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Lecture topic</th>
<th>Reading</th>
<th>Labs</th>
<th>Homeworks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6/1</td>
<td>Introduction &amp; Expectations Scale of the Cosmos</td>
<td>Ch. 1</td>
<td>Powers of Ten</td>
<td>Homework #1 Cycles of the Sky</td>
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<tr>
<td></td>
<td>6/2</td>
<td>Appearance of the Night Sky.</td>
<td>Ch. 2.1,2</td>
<td>Lost in Space</td>
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<td></td>
<td>6/3</td>
<td>Cycles of the Sky: Sun</td>
<td>Ch. 2.3</td>
<td>Solar Lab</td>
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<td></td>
<td>6/4</td>
<td>Night Observation. Class meets @9pm Alternatives: 6/3 and 6/5 @9pm</td>
<td>Ch. 3</td>
<td>Cycles of Sun</td>
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<tr>
<td></td>
<td>6/8</td>
<td>Cycles of the Sky: Moon</td>
<td>Ch. 4</td>
<td>Cycles of Moon</td>
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<td></td>
<td>6/9</td>
<td>The Men-in-black: Ancient priests. Ptolemy and Copernicus.</td>
<td>Ch. 5</td>
<td>Study session for Exam #1</td>
<td></td>
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<td></td>
<td>6/10</td>
<td>Laws of planetary (and everything else) motion. Gravity</td>
<td>Ch. 1-5</td>
<td>No lab</td>
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<tr>
<td></td>
<td>6/11</td>
<td>Exam #1. Unit 1 of the course project is due</td>
<td>No lab</td>
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<tr>
<td>2</td>
<td>6/15</td>
<td>Origin and Formation of the Solar System</td>
<td>Ch.19</td>
<td>Inventory of Solar System</td>
<td>Homework #3 Origin and Formation of Solar System</td>
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<td></td>
<td>6/16</td>
<td>Solar System Debris</td>
<td>Ch.25</td>
<td>Comets</td>
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<td></td>
<td>6/17</td>
<td>Family of Terrestrial Planets. Earth</td>
<td>Ch.20</td>
<td>Moon</td>
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<td></td>
<td>6/18</td>
<td>Moon and Mercury</td>
<td>Ch.21</td>
<td>No lab</td>
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<tr>
<td>3</td>
<td>6/22</td>
<td>Venus and Mars</td>
<td>Ch.22</td>
<td>Study session for Exam #2</td>
<td>Homework #4 Terrestrial Planets</td>
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<td></td>
<td>6/23</td>
<td>Exam #2 Unit 2 of the course project is due</td>
<td>No lab</td>
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<tr>
<td></td>
<td>6/24</td>
<td>Family of Jovian Planets. Jupiter</td>
<td>Ch.23.2</td>
<td>Frozen Worlds</td>
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<td></td>
<td>6/25</td>
<td>Night Observation. Class meets @9pm Alternatives: 6/24 and 6/26 @9pm</td>
<td>No lab</td>
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<tr>
<td>4</td>
<td>6/29</td>
<td>Almost Famous: Natural Satellites of Jupiter</td>
<td>Ch.23.3</td>
<td>Debate</td>
<td>Homework #5 Jovian Planets</td>
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<tr>
<td></td>
<td>6/30</td>
<td>Saturn</td>
<td>Ch.23.4,5</td>
<td>Make up lab</td>
<td></td>
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<tr>
<td></td>
<td>7/1</td>
<td>Outer World: Uranus and Neptune</td>
<td>Ch.24</td>
<td>Study session for Exam #3</td>
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<tr>
<td></td>
<td>7/2</td>
<td>Exam #3 Unit 3 of the course project is due</td>
<td>No lab</td>
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J. COURSE POLICIES

Attendance/Tardiness
*Students could make up only one missing lab*

Late Work and Make-up Exams
*Homework Submissions that are more than one day late will not be excepted*

Extra Credit
*No extra credit will be given*

Missed Exam
*If a student has an excuse to miss exam, the student must notify the instructor within a week before the exam or 24 hour after (in case of an emergency) to arrange an alternative.*

K. COLLEGE AND UNIVERSITY POLICIES

- **Academic Integrity (University)**
  It is expected that university students will demonstrate a high level of maturity, self-direction, and ability to manage their own affairs. Students are viewed as individuals who possess the qualities of worth, dignity, and the capacity for self-direction in personal behavior.
  See Full University Policy at http://catalog.tamucc.edu/content.php?catoid=10&navoid=313#Academic_Integrity

- **Deadline for Dropping a Course with a Grade of W (University)**
  The grade of W will be assigned to any student officially dropping a course. Please consult with the instructor before you decide to drop to be sure it is the best thing to do. Just stopping attendance and participation WILL NOT automatically result in your being dropped from the class. Should dropping the course be the best course of action, visit the Office of the University Registrar for the Course Drop Form that must be submitted. No student is eligible to receive a W without completing the official drop process by this deadline. Please consult the Academic Calendar (http://www.tamucc.edu/academics/calendar/) for the last day to drop a course.

- **Grade Appeals (College of Science and Engineering)**
  As stated in University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures, a student who believes that he or she has not been held to appropriate academic standards as outlined in the class syllabus, equitable evaluation procedures, or appropriate grading, may appeal the final grade given in the course. The burden of proof is upon the student to demonstrate the appropriateness of the appeal. A student with a complaint about a grade is encouraged to first discuss the matter with the instructor. For complete details, including the responsibilities of the parties involved in the process and the number of days allowed for completing the steps in the process, see University Procedure
13.02.99.C2.01, Student Grade Appeal Procedures. These documents are accessible through the University Rules website at http://www.tamucc.edu/provost/university_rules/index.html, and the College of Science and Engineering Grade Appeals webpage at http://sci.tamucc.edu STUDENTS/GradeAppeal.html. For assistance and/or guidance in the grade appeal process, students may contact the chair or director of the appropriate department or school, the Office of the College of Science and Engineering Dean, or the Office of the Provost.

- **Disability Services**
  Disability Services (DS) is the hub for coordinating services and accommodations to ensure accessibility and utilization of all programs for all Texas A&M University-Corpus Christi students with disabilities. Our services are designed to meet the unique educational needs of enrolled students with documented permanent or temporary disabilities. DS provides intake and consultation services to students seeking to register with our office. DS reviews an individual’s documentation of disability and assesses eligibility for services and the determination of reasonable accommodations. For more information visit the Disability Services Office at 116 Corpus Christi Hall or go to http://disabilityservices.tamucc.edu/

L. **OTHER INFORMATION**

**GENERAL DISCLAIMER**
I reserve the right to modify the information, schedule, assignments, deadlines, and course policies in this syllabus if and when necessary. I will announce such changes in a timely manner during regularly scheduled lecture periods.