HORRY GEORGETOWN TECHNICAL COLLEGE

INSTRUCTIONAL PACKAGE

AST 101

Solar System Astronomy

Effective Term
Fall 2019, Spring 2020

INSTRUCTIONAL PACKAGE

Part I: Course Information

Effective Term: 2019-2020

COURSE PREFIX: AST 101 COURSE TITLE: Solar System Astronomy

CONTACT HOURS: 3-3 CREDIT HOURS: 4

RATIONALE FOR THE COURSE:
AST 101 introduces scientific processes such as analysis of light spectra, planetary system formation, techniques for searching for extra-solar planets and summarizing scientific laws that govern these processes. By critically evaluating information presented, students prepare for scientific fields in which they will be expected to apply scientific principles in their careers.

COURSE DESCRIPTION:
This course is a descriptive survey of the universe with emphasis on basic physical concepts and the objects in the solar system. Related topics of current interest are included in the course.

PREREQUISITES/CO-REQUISITES:
Credit level MAT 101 Minimum Grade of C or Credit level MAT 101 Minimum Grade of TC or Credit level MAT 102 Minimum Grade of C or Credit level MAT 102 Minimum Grade of TC or Credit level MAT 110 Minimum Grade of C or Credit level MAT 110 Minimum Grade of TC or Credit level MAT 120 Minimum Grade of C or Credit level MAT 120 Minimum Grade of TC or Credit level MAT 155 Minimum Grade of C or Credit level MAT 155 Minimum Grade of TC or SAT Mathematics 400 or New SAT Mathematics 420 or ACT Math 15 or COMPANION Arithmetic 024 or ACCUPLACER Arithmetic 024 or ACCUPLACER Elementary Algebra 040 or New ACCUPLACER Arithmetic 220 or New ACCUPLACER Adv Algebra 200 or COMPANION Elementary Algebra 040 or Multiple Measures Math 1 and On-Line Orientation 1
Online/Hybrid courses require students to complete the DLi Online Student Orientation prior to completing an online course. The DLi Online Student Orientation can be found in WaveNet, under the My Student tab.

REQUIRED MATERIALS:
Please visit the Bookstore online site for most current textbook information. Use the direct link below to find textbooks.
BOOKSTORE.

Enter the semester, course prefix, number and section when prompted and you will be linked to the correct textbook.

ADDITIONAL REQUIREMENTS:

Registration with the *Norton Publishing Digital Landing Page* for *21st Century Astronomy 6e* is a required component of this course. In addition, access to *Starry Night College – For Students* planetarium style software is required for the Lab component of the course.

For Hybrid/Online Students Only: Each student will be required to view an orientation PowerPoint presentation during the first week of class. This presentation can be found on the course homepage in D2L under News. After viewing the presentation, all online students must complete the orientation quiz, which can be found under the dropdown assignment menu. A student will not be considered officially enrolled in the course until the presentation has been viewed and the quiz completed with a 100% score. Any submitted work from the student including discussion posts, assignments, etc. will not be given a grade until the presentation has been viewed and the quiz has been submitted. Failure to view the presentation and take the quiz before midnight on the last day to add/drop classes will result in the student being automatically dropped from the course.

TECHNICAL REQUIREMENTS:

Access to Desire2Learn (D2L), HGTC's student portal for course materials.
WaveNet and D2L email access.

STUDENT IDENTIFICATION VERIFICATION

Students enrolled in online courses will be required to participate in a minimum of one (1) proctored assignment and/or one (1) virtual event to support student identification verification. Please refer to your Instructor Information Sheet for information regarding this requirement.

CLASSROOM ETIQUETTE:

As a matter of courtesy to other students and your professor, please turn off cell phones and other communication/entertainment devices before class begins. If you are monitoring for an emergency, please notify your professor prior to class and switch cell phone ringers to vibrate.

NETIQUETTE: is the term commonly used to refer to conventions adopted by Internet users on the web, mailing lists, public forums, and in live chat focused on online communications etiquette. For more information regarding Netiquette expectations for distance learning courses, please visit Online Netiquette.

ACADEMIC DISHONESTY:

All forms of academic dishonesty, as outlined in the Student Code in the HGTC catalog, will NOT be tolerated and will result in disciplinary action. Anyone caught cheating or committing plagiarism (Defined in the code as: "The appropriation of any other person's work and the unacknowledged incorporation of that work in one's own work offered for credit") will be given a grade of a zero for that assignment and reported to the Senior VP of Academic Affairs, in accordance with the student handbook. A second offense will result in the student being withdrawn from the course with a "WF" and charges being filed with the Chief Student Services Officer.

Part II: Student Learning Outcomes

COURSE LEARNING OUTCOMES and ASSESSMENTS*:

Chapter 1: Thinking Like an Astronomer
Describe the size and age of the universe and Earth's place in it.
Explain how astronomers use the scientific method to study the universe
Show how astronomers use mathematics, including graphs, to find patterns in nature
Describe our astronomical origins.

Chapter 2: Patterns in the Sky – Motions of Earth and the Moon
Describe how Earth's rotation about its axis and its revolution around the Sun affect how we perceive celestial motions from different places on Earth.
Explain why seasons change throughout the year.
Describe the factors that create the phases of the Moon.
Sketch the alignment of Earth, the Moon and the Sun during eclipses of the Sun and the Moon.

Chapter 3: Motions of Astronomical Bodies
Compare the geocentric and heliocentric models of the Solar System.
Use Kepler's Laws to describe how objects in the Solar System move.
Explain how Galileo's astronomical discoveries convinced him that the heliocentric model was correct.
Describe the physical laws of motion discovered by Galileo and Newton.

Chapter 4: Gravity and Orbits
Explain the elements of Newton's universal law of gravitation.
Use the laws of motion and gravitation to explain planetary orbits.
Explain how tidal forces from the Sun and Moon create Earth's tides.
Describe how tidal forces affect solid bodies

Chapter 5: Light
Describe the wave and particle properties of light and describe the electromagnetic spectrum
Describe how to measure the chemical composition of distant objects by using the unique spectral lines of different types of atoms.
Describe the Doppler effect and how it can be used to measure the motion of distant objects.
Explain how the spectrum of light that an object emits depends on its temperature.
Differentiate luminosity from brightness and illustrate how distance affects each.

Chapter 6: The Tools of the Astronomer
Compare how the two main types of optical telescopes gather and focus light.
Summarize the main types of detectors that are used on telescopes.
Explain why some wavelengths of radiation must be observed from high, dry and remote observatories on Earth or from space.
Explain the benefits of sending spacecraft to study the planets and moons of our Solar System.
Describe other astronomical tools that contribute to the study of the universe.

Chapter 7: The Formation of Planetary Systems

Describe how our understanding of planetary system formation developed from the work of both planetary and stellar scientists.

Discuss the role of gravity and angular momentum in explaining why planets orbit the Sun in a plane and why the revolve in the same direction that the Sun rotates.

Explain how temperature at different locations in the protoplanetary disk affects the composition of planets, moons and other bodies.

Discuss the processes that resulted in the formation of planets and other objects in our Solar System.

Describe how astronomers find planets around other stars and derive exoplanet properties.

Chapter 8: The Terrestrial Planets and Earth's Moon

Describe how impacts have affected the evolution of the terrestrial planets.

Explain how radiometric dating is used to measure the ages of rocks and terrestrial planet surfaces.

Explain how scientists use both theory and observation to determine the structure of terrestrial planetary interiors.

Describe tectonism and volcanism and the forms they take on different terrestrial planets

Summarize what is known about the presence of water on the terrestrial planets.

Chapter 9: Atmospheres of the Terrestrial Planets

Identify the processes that cause primary and secondary atmospheres to be formed, retained and lost.

Compare the strength of the greenhouse effect on Earth, Venus and Mars, and how it contributes to differences among the atmospheres of those planets.

Describe the layers of the atmospheres on Earth, Venus and Mars.

Explain how Earth's atmosphere has been reshaped by the presence of life.

Describe the evidence that shows Earth's climate is changing and how comparative planetology contributes to a better understanding of those changes.

Chapter 10: Worlds of Gas and Liquid – The Giant Planets

Differentiate the giant planets from one another and from the terrestrial planets.

Describe the atmosphere of each giant planet.

Explain the extreme conditions deep inside the giant planets.

Describe the magnetosphere of each giant planet.

Compare the planets of our Solar System with those in exoplanetary systems.

Chapter 11: Planetary Moons and Rings

Compare the orbits and formation of regular and irregular moons.

Describe the evidence for geological activity and liquid oceans on some of the moons.

Describe the composition, origin and general structure of the rings of the giant planets.

Explain the role gravity plays in the structure of the rings and the behavior of ring particles.

Chapter 12: Dwarf Planets and Small Solar System Bodies

List the categories of small bodies and identify their locations in the Solar System.

Describe the defining characteristics of the dwarf planets in the Solar System.

Describe the origin of the types of asteroids, comets and meteorites.

Explain how asteroids, comets and meteoroids provide important clues about the history and formation of the Solar System.
Describe what has been learned from observations of recent impacts in the Solar System.

Students – please refer to the Instructor's Course Information sheet for specific information on assessments and due dates.

Part III: Grading and Assessment

EVALUATION OF REQUIRED COURSE MEASURES/ARTIFACTS*

Students' performance will be assessed and the weight associated with the various measures/artifacts are listed below.

EVALUATION*

Lecture	75%
Lab	25%
Total	100%

Students, for the specific number and type of evaluations, please refer to the Instructor's Course Information Sheet.

GRADING SYSTEM:

Please note the College adheres to a 10 point grading scale A = 100 – 90, B = 89- 80, C = 79 – 70, D = 69 – 60, F = 59 and below.

Grades earned in courses impact academic progression and financial aid status. Before withdrawing from a course, be sure to talk with your instructor and financial aid counselor about the implications of that course of action. Ds, Fs, Ws, WFs and Is also negatively impact academic progression and financial aid status.

The Add/Drop Period is the first 5 days of the semester for **full term** classes. Add/Drop periods are shorter for accelerated format courses. Please refer to the academic calendar for deadlines for add/drop (ACADEMIC CALENDAR). You must attend at least one meeting of all of your classes during that period. If you do not, you will be dropped from the course(s) and your Financial Aid will be reduced accordingly.

Part IV: Attendance

Horry-Georgetown Technical College maintains a general attendance policy requiring students to be present for a minimum of 80 percent (80%) of their classes in order to receive credit for any course. Due to the varied nature of courses taught at the college, some faculty may require up to 90 percent (90%) attendance. Pursuant to 34 Code of Federal Regulations 228.22 - Return to Title IV Funds, once a student has missed over 20% of the course or has missed two (2) consecutive weeks, the faculty is

obligated to withdraw the student and a student may not be permitted to reenroll. **Instructors define absentee limits for their class at the beginning of each term; please refer to the Instructor Course Information Sheet.**

For online and hybrid courses, check your Instructor's Course Information Sheet for any required on-site meeting times. Please note, instructors may require tests to be taken at approved testing sites, if you use a testing center other than those provided by HGTC, the center may charge a fee for its services.

Lecture Attendance:
For a 15-week course (fall and spring), the allowed number of absences for a MW or TR class is as follows: 6 absences are allowed for lecture, regardless of reason. For a lecture class that meets once a week, the allowed number of absences is three (3). When a student surpasses the allowed number of absences, the student will be dropped automatically from the course with a W or a WF. Remember, an absence is an absence, no matter if it is excused or not!

Lab Attendance:
Students are allowed two (2) lab absences for a lab that meets weekly. When a student surpasses the allowed number of absences, the student will be dropped automatically from the course with a W or a WF.

Online/Hybrid Attendance:
Students enrolled in distance learning courses (hybrid and online) are required to maintain contact with the instructor on a regular basis to be counted as "in attendance" for the course. All distance learning students must participate weekly in an Attendance activity in order to demonstrate course participation. Students showing no activity in the course for two weeks (these weeks do not need to be consecutive) will be withdrawn due to lack of attendance.

Lab Attendance for Hybrid Courses:
Students in hybrid classes in which labs only meet 5 or 6 times during the semester, must attend all lab sessions for its entirety. Failure to attend one lab will result in immediate withdrawal. Students in hybrid classes where labs meet every week, you are allowed one lab absence. When a student surpasses the allowed number of absences, the student will be dropped automatically from the course with a W or a WF.

Part V: Student Resources

The Student Success and Tutoring Center (SSTC)

The SSTC offers to all students the following **free** resources:

1. **Academic coaches** for most subject areas, **Writing Center Support**, and **college success skills.**

2. **On-line student success and academic support resources.**

Visit the SSTC website: Student Success & Tutoring Center and visit the student services tab in your WaveNet account to schedule appointments using TutorTrac. For more information, call: SSTC Conway, 349-7872; SSTC Grand Strand, 477-2113; and SSTC Georgetown, 520-1455 or go to the Online Resource Center to access on-demand resources any time.

TECH Central – Student Information Center

TECH Central provides quality enrollment and collegiate guidance for students, faculty, and staff. Services include phone, walk-in, and online technical support for technology training and troubleshooting. Additionally, we offer support in Office 365, Outlook E-mail setup, and ID cards.
Phone: 843-349-5340
Email: techcentral@hgtc.edu
Text: 843-357-8552
TECH Talk (Live Chat): Located on the "Home" tab in WaveNet.
Website: www.hgtc.edu/techcentral

Locations:
Conway Building 1100, Room 132D
Grand Strand Building 200, Room 136

Student Testing: (If course is offered in multiple format include this section, delete if only F2F sections are offered.)

Testing in an **online/hybrid** course may be accomplished in a variety of ways:

- Test administered within D2L
- Test administered in writing on paper
- Test administered through Publisher Platforms

Further more tests may have time limits and/or require a proctor.

Proctoring can be accomplished either face-to-face at an approved site or online through RPNow, our online proctoring service. To find out more about proctoring services, please visit the Online Testing section of the HGTC's Testing Center webpage.

The **Instructor Information Sheet** will have more details on test requirements for your course.

Disability Services:

HGTC is committed to providing an accessible environment for students with disabilities. Inquiries may

be directed to Beth Havens, Director of Student Development on the Conway Campus Jaime Davis, Counselor/Advisor on the Georgetown Campus or Kristin Griffin, Counselor on the Grand Strand Campus. These individuals will review documentation of the student's disability and, in a confidential setting with the student, develop an educational accommodation plan.

Note: It is the student's responsibility to self-identify as needing accommodations and to provide acceptable documentation. After a student has self-identified and submitted documentation of a disability, accommodations may be determined, accepted, and provided.

Statement of Equal Opportunity/Non-Discrimination Statement

Horry-Georgetown Technical College prohibits discrimination and harassment, including sexual harassment and abuse, on the basis of race, color, sex, national or ethnic origin, age, religion, disability, marital or family status, veteran status, political ideas, sexual orientation, gender identity, or pregnancy, childbirth, or related medical conditions, including, but not limited to, lactation in educational programs and/or activities.

Inquiries regarding the non-discrimination policies: Students and prospective student inquiries concerning Section 504, Title II, and Title IX and their application to the College or any student decision may be directed to the Vice President for Student Affairs, Dr. Melissa Batten, VP Student Affairs, Title IX Coordinator, Building 1100, Room 107A, Conway Campus, PO Box 261966, Conway, SC 29528-6066, 843-349-5228, Melissa.Batten@hgtc.edu. Employee and applicant inquiries concerning Section 504, Title II, and Title IX and their application to the College may be directed to the Vice President for Human Resources, Jacquelyne Snyder, VP Human Resources, Section 504, Title II, and Title IX Coordinator, Building 200, Room 212A, Conway Campus, PO Box 261966, Conway, SC 29528-6066, 843-349-5212, Jacquelyne.Snyder@hgtc.edu.

Title IX Requirements

All students (as well as other persons) at Horry-Georgetown Technical College are protected by Title IX—regardless of their sex, sexual orientation, gender identity, part- or full-time status, disability, race, or national origin—in all aspects of educational programs and activities. Any student, or other member of the college community, who believes that he/she is or has been a victim of sexual harassment or sexual violence may file a report with the college's Chief Student Services Officer, campus law enforcement, or with the college's Title IX Coordinator, or designee.

> *Faculty and Staff are required to report incidents to the Title IX Coordinators when involving students. The only HGTC employees exempt from mandatory reporting are licensed mental health professionals (only as part of their job description such as counseling services).

Inquiries regarding the non-discrimination policies:	
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