HORRY GEORGETOWN TECHNICAL COLLEGE

INSTRUCTIONAL PACKAGE

AST 101

Solar System Astronomy

Effective Term

Fall 2021

INSTRUCTIONAL PACKAGE

Part I: Course Information

Effective Term: 2021-2022

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))

*__Online/Hybrid__ courses require students to complete the DLi Orientation Video prior to enrolling in an online course.

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

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.
myHGTC and college 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: Science and the Universe
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: Observing the Sky
Define the main features of the celestial sphere.
Explain the system astronomers use to describe the sky.
Describe how motions of the stars appear to us on Earth
Describe how motions of the Sun, Moon, and planets appear to us on Earth.
Summarize the Greek contributions to early astronomy.
Compare the geocentric and heliocentric models of the Solar System.

Chapter 3: Orbits and Gravity
Explain Kepler's three laws of planetary motion.
Describe Newton's three laws of motion.
Define angular momentum.
Explain the elements of Newton's universal law of gravitation.
Use the laws of motion and gravitation to explain planetary orbits.
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Chapter 4: Earth, Moon, and Sky
Describe the terrestrial and astronomical coordinate systems.
Explain why seasons change throughout the year.
Explain the origins of our modern calendar.
Describe the phases of the Moon and why they occur.
Summarize what causes tides on Earth.
Describe the cause and characteristics of lunar and solar eclipses.

Chapter 5: Radiation and Spectra
Describe the wave and particle properties of light.
Describe the electromagnetic spectrum and how it interacts with Earth's atmosphere.
Explain how/why the light seen from distant objects is dependent on their distance from Earth.
Summarize the temperature dependence for the spectrum of light an object emits.
Outline the three types of light spectra.
Describe the Doppler effect and its astronomical applications.

Chapter 6: Astronomical Instruments
Explain the main functions of a telescope.
Compare the two main types of optical telescopes.
Describe the effects of the atmosphere on astronomical observations.
Compare the main types of astronomical instruments/detectors.

Describe the detection of radio waves from space and the technique of interferometry.
List the advantages of making astronomical observations from space.
Describe the next generation of ground- and space-based observatories.

Chapter 7: Introduction to the Solar System
Describe the characteristics of the giant planets, terrestrial planets, and small bodies in the Solar System.
Summarize why there is geological activity on some planets and not on others.
Explain what influences the temperature of a planet's surface.
Describe the different methods for dating planets.
Discuss the processes that resulted in the formation of planets and other objects in our Solar System.
Describe how the characteristics of extra-solar systems help us to model our own Solar System.
Summarize how impacts have affected the evolution of the solar system.

Chapter 8: Earth as a Planet
Describe the Earth's interior structure and the techniques used to determine it.
Explain the theory of plate tectonics.
Summarize the volcanic activity occurring on Earth.
Identify Earth's atmospheric layers.
Describe the chemical composition and origins of Earth's atmosphere.
Explain the greenhouse effect.
Describe how impacts have influenced the evolution of life on Earth.

Chapter 9: The Moon and Mercury
Summarize the composition and structure of the Moon.
Differentiate between the major surface features of the Moon.
Compare the early Moon formation hypotheses with the current "giant impact" model.
Characterize the orbit of Mercury.
Describe Mercury's structure, composition, and surface features.
Summarize current ideas on the origin and evolution of Mercury.

Chapter 10: Earthlike Planets: Venus and Mars
Compare the basic physical properties of Earth, Mars, and Venus, including their orbits
Describe the surface features of Venus
Compare the tectonic activity and volcanoes on Venus with those of Earth
Summarize the atmosphere on Venus and its "greenhouse" effect
Compare the surface features of Mars with those of Earth
Describe the general composition of the atmosphere on Mars
Compare the planetary evolution of Venus, Earth, and Mars

Chapter 11: The Giant Planets
Summarize the composition and structure of the 4 Gas Giants.
Describe the basic physical characteristics, general appearance, and rotation of the giant planets.
Explain the discovery and characteristics of the giant planets' magnetic fields.
Discuss the atmospheric composition of the giant planets.
Describe the cloud formation and atmospheric structure of the gas giants.
Characterize the giant planets' wind and weather patterns.

Chapter 12: Rings, Moons, and Pluto
Summarize the major moons of the jovian planets.
Describe the basic composition/structure of the rings of the jovian planets.
Compare the surface features seen on the major moons of Jupiter.
Summarize what we've learned of the surface and atmosphere of Titan.
Describe the features seen on Triton during the Voyager 2 mission to the outer planets.
Compare the orbital characteristics of Pluto with those of the other planets.
Summarize the information gained from the New Horizons mission.
Describe the two theories of planetary ring formation.
Summarize the role of moons in a ring structure.

Chapter 13: Comets and Asteroids
Describe the composition, classification, and orbital characteristics of the asteroids.
Summarize the information gained from spacecraft missions to several asteroids.
Characterize the general physical appearance and composition of comets.
Explain the range of cometary orbits.
Summarize the discovery and composition of the Oort Cloud.
Describe trans-Neptunian and Kuiper Belt objects.

Chapter 14: Meteors, Meteorites, and the Origin of the Solar System
Explain the origin of meteorites and the difference between a meteor and a meteorite.
Compare the stone meteorites with the other major types.
Explain how meteorites contribute to our understanding of the age of the Solar System.
Describe how "comparative planetology" contributes to a better understanding of planetary system formation.
Describe the main events in the evolution of the Solar System.
Compare the main characteristics of other planetary systems with our Solar System.
Describe how astronomers find planets around other stars and derive exoplanet properties.
Summarize the evolution of the atmospheres of Venus, Earth, and Mars in the early history of 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. 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 tutors** for most subject areas, **Writing Center support**, and **college success skills**.
2. Online **tutoring** and academic support resources.
3. Professional and interpersonal communication **coaching** in the EPIC Labs.

Visit the Student Success & Tutoring Center website for more information. To schedule tutoring, contact the SSTC at sstc@hgtc.edu or self-schedule in the Penji iOS/Android app or at www.penjiapp.com. Email sstc@hgtc.edu or 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.

STUDENT INFORMATION CENTER: TECH Central

TECH Central offers to all students the following free resources:

1. **Getting around HGTC**: General information and guidance for enrollment, financial aid, registration, and payment plan support!
2. Use the Online Resource Center (ORC) including Office 365 support, password resets, and username information.
3. **In-person workshops, online tutorials and more services** are available in Desire2Learn, Student Portal, Degree Works, and Office 365.

4. **Chat with our staff on TECH Talk**, our live chat service. TECH Talk can be accessed on the student portal and on TECH Central's website, or by texting questions to (843) 375-8552.

Visit the Tech Central website for more information. Live Chat and Center locations are posted on the website. Or please call (843) 349 – TECH (8324), Option #2.

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

Furthermore, 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 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 HGTC's Accessibility and Disability Service webpage. The Accessibility and Disability staff 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.

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/TITLE IX POLICIES:

Student 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
EEO and Title IX Coordinator
Building 200, Room 212A, Conway Campus
PO Box 261966, Conway, SC 29528-6066
843-349-5212
Jacquelyne.Snyder@hgtc.edu