HORRY GEORGETOWN TECHNICAL COLLEGE

INSTRUCTIONAL PACKAGE

AST 102

Stellar Astronomy

Effective Term
Fall 2019, Spring 2020

INSTRUCTIONAL PACKAGE

Part I: Course Information

Effective Term: 2019-2020

COURSE PREFIX: AST 102 COURSE TITLE: Stellar Astronomy

CONTACT HOURS: 3-3 CREDIT HOURS: 4

RATIONALE FOR THE COURSE:
AST 102 includes a study of stars, star structures, galaxies and galaxy clusters. It allows students to complete an in-depth evaluation of scientific information presented, thus preparing them for future scientific careers.

COURSE DESCRIPTION:
This course is a descriptive survey of the universe with emphasis on basic physical concepts and galactic and extra- galactic objects. 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 ACCUPLACER Elementary Algebra 040 or New ACCUPLACER Arithmetic 220 or New ACCUPLACER Adv Algebra 200 or COMPANION Elementary Algebra 040 or SAT Mathematics 400 or New SAT Mathematics 420 or ACT Math 15
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:
Mastering Astronomy access from Pearson is a required component of this course.

Voyager Program from Carina Software 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 13: Taking the Measure of Stars

Explain how astronomers use the brightness of nearby stars and their distances from Earth to determine their luminosity
Explain how astronomers obtain the temperatures, sizes and compositions of stars.
Describe how astronomers estimate the masses of stars
Classify stars and organize that information on a Hertzprung-Russell (H-R) diagram.
Explain how the mass and composition of a main-sequence star determine its luminosity, temperature and size.

Chapter 14: Our Star – The Sun

Describe the balance between the forces that determine the structure of the Sun.
Explain how mass is converted to energy in the Sun's core and how long the Sun will take to use up its fuel.
Sketch a physical model of the interior of the Sun, and list the ways that energy moves outward from the Sun's core toward its surface.
Describe how solar neutrinos and seismic vibrations on the surface of the Sun test astronomer's models of the Sun.
Describe the solar activity cycles of 11 and 22 years, and explain how those cycles are related to the Sun's changing magnetic field.

Chapter 15: The Interstellar Medium and Star Formation

Describe the types and states of material that exist in the space between the stars and how that material is detected.
Explain the conditions under which a cloud of gas can contract into a stellar system and the role that gravity and angular momentum play in forming stars and planets.
List the steps in the evolution of a protostar and explain how the mass of the protostar affects its evolution.
Describe the track of a protostar as it evolves to a main sequence star on the Hertzsprung-Russell (H-R) diagram.

Chapter 16: Evolution of Low-Mass Stars

Estimate the main-sequence lifetime of a star from its mass.
Explain why low-mass stars grow larger and more luminous as they run out of fuel.
Sketch post-main-sequence evolutionary tracks on a Hertzsprung-Russell (H-R) diagram and list the stages of evolution for low-mass stars.
Describe how planetary nebulae and white dwarfs form.
Explain how some close binary systems evolve differently from single stars.

Chap17: Evolution of High-Mass Stars

Describe how the death of high-mass stars differs from that of low-mass stars.
List the sequence of stages for evolving high-mass stars.
Explain the origin of chemical elements up to and heavier than iron.
Identify how Hertzsprung-Russell (H-R) diagrams of clusters enable astronomers to measure the ages of stars and test theories of stellar evolution.

Chapter 18: Relativity and Black Holes

Describe how the motion of the observer affects the observed velocity of objects.
Discuss the observable consequences of the relationship between space and time.
Explain how gravity is a consequence of the way mass distorts the very shape of spacetime.
Explain the formation of black holes from the most massive stars, and describe the key properties and observational consequences of those stellar black holes.

Chapter 19: Galaxies

Determine a galaxy's type from its appearance and describe the motions of its stars.
Explain the distance ladder and how distances to galaxies are measured.
Describe the evidence suggesting that galaxies are composed mostly of dark matter.
Discuss the evidence indicating that most – perhaps all – large galaxies have supermassive black holes at their centers.

Chapter 20: The Milky Way – A Normal Spiral Galaxy

Explain how astronomers discovered the size and spiral structure of the Milky Way.
List the clues of galaxy formation that can be found from the components of the Milky Way.
Explain the evidence for the dark matter halo and for the supermassive black hole at the center of the Milky Way.
Describe the Local Group of galaxies and how it offers clues about the evolution of the Milky Way.

Chapter 21: The Expanding Universe

Explain in detail the cosmological principle.
Describe how the Hubble constant can be used to estimate the age of the universe.
Describe the observational evidence for the Big Bang.
Explain which chemical elements were created in the early hot universe.

Chapter 22: Cosmology

Explain how mass within the universe and the gravitational force it produces affect the history, shape and fate of the universe.
Describe the evidence for the accelerating expansion of the universe.
Describe the early period of rapid expansion of the universe known as inflation.
Explain how the events that occurred in the earliest moments of the universe are related to the forces that operate in the modern universe.

Chapter 23: Large-Scale Structure in the Universe

Discuss the distribution of galaxies in the universe.
Explain how the large-scale structure of today's universe evolved from the structure that began to form shortly after the Big Bang.
Describe the formation of the first stars and galaxies.
Explain how the observations of galaxies at different redshifts illustrate the evolution of the large-scale structure of the universe.

Chapter 24: Life

Explain our current understanding of how and when life began on Earth and how it has evolved.
Explain how life is a structure that has evolved through the action of the physical and chemical processes that shape the universe.
Describe the locations in our Solar System and around other stars where astronomers think life might be possible.
Describe some methods used to search for intelligent extraterrestrial life.

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).

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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	**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