# Star & Galaxies – PHYS 1303.001 F2F

**Course Syllabus:** Spring 2023

***"Northeast Texas Community College exists to provide personal, dynamic learning experiences empowering students to succeed."***


## Instructor: Mark Ellermann

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| | Monday | Tuesday | Wednesday | Thursday | Friday |
|---|---|---|---|---|---|
| **Office Hours** | 8:00 – 9:20<br>1:30 – 6:00 | 4:30 – 5:30 | 8:00 – 9:20<br>4:30 – 5:30 | 1:30 – 2:00 | N/A |

***This syllabus serves as the documentation for all course policies and requirements, assignments, and instructor/student responsibilities.***

*Information relative to the delivery of the content contained in this syllabus is subject to change. Should that happen, the student will be notified.*

**Course Description:** This course focuses on the history, development, and modern use of astronomy. It covers solar, galactic, and universal aspects of astronomy including stellar evolution, black holes, and current cosmological concepts. Three hours college credit.

**Prerequisite(s):** TSI Complete Status

**Student Learning Outcomes:**

1303.1 Recognize scientific and quantitative methods and the differences between these approaches and other methods of inquiry used in modern astrophysics.

1303.2 Communicate observations and interpretations clearly through written communication.

1303.3 Use basic laws of astronomy to solve assigned tasks.

1303.4 Translate, interpret, and extrapolate scientific theory governing the formation and evolution of stars.

1303.5 Translate, interpret, and extrapolate scientific theory governing the formation and evolution of galaxies and the universe.

1303.6 Use simple astronomy laboratory techniques to collect, manipulate, analyze, and draw conclusions from data representing physical phenomenon while working individually and in teams.

**Core Curriculum Purpose and Objectives:**
Through the core curriculum, students will gain a foundation of knowledge of human cultures and the physical and natural world; develop principles of personal and social responsibility for living in a diverse world; and advance intellectual and practical skills that are essential for all learning.

Courses in the foundation area of mathematics focus on quantitative literacy in logic, patterns, and relationships. In addition, these courses involve the understanding of key mathematical concepts and the application of appropriate quantitative tools to everyday experience.

**Program Student Learning Outcomes:**

Critical Thinking Skills

CT.1 Students will demonstrate the ability to 1) analyze complex issues, 2) synthesize information, and 3) evaluate the logic, validity, and relevance of data.

Communication Skills

CS.1 Students will effectively develop, interpret and express ideas through written communication.

Empirical and Quantitative Skills

EQS.1 Students will manipulate numerical data or observable facts by organizing and converting relevant information into mathematical or empirical form

EQS.2 Students will analyze numerical data or observable facts by processing information with correct calculations, explicit notations, and appropriate technology.

EQS.3 Students will draw informed conclusions from numerical data or observable facts that are accurate, complete, and relevant to the investigation.

Teamwork

TW.2 Students will work with others to support and accomplish a shared goal.

**Evaluation/Grading Policy:**
We will be using the Starry Night curriculum this semester. You will find a link in the class Blackboard that take you to the website where you will complete your assignments. Reading Quizzes are expected to be completed the week before stated on the schedule posted at the end of this syllabus. Reading Quizzes in Starry Night will represent 20% of your grade and Exercises in Starry Night will count 20%. Participation in class discussions counts a total of 20% (absences or refusal to participate will result in losing points). There will be four tests: Chapter Test 1, Midterm (Chapters 15-22), Chapter Test 2, and a Final Exam (Chapters 23-30). Each test is worth 10% of your final grade. The letter grading system is:

**A** (90% - 100%)
**B** (80% - 89%)
**C** (70% - 79%)
**D** (60% - 69%)
**F** ( < 60% )

**Tests / Exams:**

Chapter Test 1: Chapters 15-18
MIDTERM EXAM: Chapters 15-23
Chapter Test 2: Chapters 24-26
FINAL EXAM: Chapters 24-26, 28-30

**Tests are two parts: The first part is a group writing assignment where you will work with others to critique an article reported on a scientific topic. The second part is an individual, multiple-choice test. Each part of the test counts as 50% of the total grade.**

**Required Instructional Materials:**
*This title is not included in the Inclusive Access program*
P. Braganca. *Starry Night College Textbook Edition*. Simulation Curriculum.

**Publisher: Simulation Curriculum** **ISBN Number: 978-1-7330225-6-9**

**Optional Instructional Materials:** None

**Minimum Technology Requirements:** Computer Access/Internet Access, Scientific calculator

**Required Computer Literacy Skills**: You will need access to Blackboard and learn.simcur.com to complete all assignments and tests.

**Course Structure and Overview:**
Students will be responsible for completing the reading assignments listed in the syllabus schedule to perform well on the reading quizzes and exams. Discussion assignments are made to assist in critical thinking and connecting individual facts to make a more complete concept.

**Communications:** Email will be responded to within 24 hours IF SENT SUNDAY-THURSDAY. Any information that I send out will be done in class, via Blackboard, or via NTCC email. I will NOT email sensitive information to a non-NTCC address.

**Institutional/Course Policy:** Late work will not be accepted without prior approval by the instructor. Students and instructor are expected to treat each other with respect in all communication (email, phone call, and discussion board).

**Alternate Operations During Campus Closure and/or Alternate Course Delivery Requirements**
In the event of an emergency or announced campus closure due to a natural disaster or pandemic, it may be necessary for Northeast Texas Community College to move to altered operations. During this time, Northeast Texas Community College may opt to continue delivery of instruction through methods that include, but are not limited to, online through the Blackboard Learning Management System, online conferencing, email messaging, and/or an alternate schedule. It is the responsibility of the student to monitor NTCC's website (http://www.ntcc.edu/) for instructions about continuing courses remotely, Blackboard for each class for course-specific communication, and NTCC email for important general information.

Additionally, there may be instances where a course may not be able to be continued in the same delivery format as it originates (face-to-face, fully online, live remote, or hybrid). Should this be the case, every effort will be made to continue instruction in an alternative delivery format. Students will be informed of any changes of this nature through email messaging and/or the Blackboard course site.

**NTCC Academic Honesty/Ethics Statement:**
NTCC upholds the highest standards of academic integrity. The college expects all students to engage in their academic pursuits in an honest manner that is beyond reproach using their intellect and resources designated as allowable by the course instructor. Students are responsible for addressing questions about allowable resources with the course instructor. Academic dishonesty such as cheating, plagiarism, and collusion is unacceptable and may result in disciplinary action. This course will follow the NTCC Academic Honesty and Academic Ethics policies stated in the Student Handbook. Refer to the student handbook for more information on these subjects.

**ADA Statement:**
It is the policy of NTCC to provide reasonable accommodations for qualified individuals who are students with disabilities. This College will adhere to all applicable federal, state, and local laws, regulations, and guidelines with respect to providing reasonable accommodations as required to afford equal educational opportunity. It is the student's responsibility to request accommodations. An appointment can be made with the Academic Advisor/Coordinator of Special Populations located in Student Services and can be reached at 903-434-8264. For more information and to obtain a copy of the Request for Accommodations, please refer to the special populations page on the NTCC website.

**Family Educational Rights and Privacy Act (FERPA)**:
The Family Educational Rights and Privacy Act (FERPA) is a federal law that protects the privacy of student education records. The law applies to all schools that receive funds under an applicable program of the U.S. Department of Education. FERPA gives parents certain rights with respect to their children's educational records. These rights transfer to the student when he or she attends a school beyond the high school level. Students to whom the rights have transferred are considered "eligible students." In essence, a parent has no legal right to obtain information concerning the child's college records without the written consent of the student. In compliance with FERPA, information classified as "directory information" may be released to the general public without the written consent of the student unless the student makes a request in writing. Directory information is defined as: the student's name, permanent address and/or local address, telephone listing, dates of attendance, most recent previous education institution attended, other information including major, field of study, degrees, awards received, and participation in officially recognized activities/sports.

**Tentative Course Timeline (*note* instructor reserves the right to adjust this timeline at any point in the term):**

| Timing | Reading | Tuesday Discussion | Thursday Discussion | Exercises Due |
|---|---|---|---|---|
| **Week 1** | Preface, Ch 1 | • Syllabus, General Instructions, Scientific Thinking | • Size of the Universe | • Tutorial: Astronomy Simulator Basics<br>• Exercise: A Brief Tour of the Universe<br>• Chapter 1 Reading Quiz |
| **Week 2** | Ch 15, 16 | • What is in the Sun?<br>• How does the Sun affect us? (Besides sunlight) | • What powers the Sun?<br>• How do we probe the inside of the Sun? | • Ch. 15 Reading Quizzes<br>• Ch. 15 Exercises<br>• Ch. 16 Reading Quizzes |
| **Week 3** | Ch. 17 | • Using light to measure stars | • Using spectra to measure stars | • Ch. 17 Reading Quizzes<br>Ch. 17 Exercises |
| **Week 4** | Ch. 18 | • How 'normal' is the Sun? | • Using the H-R Diagram | • Ch. 18 Reading Quizzes<br>• Ch. 18 Exercises |
| **Week 5** | Chapter Test: 15-18 | | | |
| **Week 6** | Ch. 19, 20 | • How far are other stars? | • What fills the space between stars? | • Ch. 19 Reading Quizzes<br>• Ch. 19 Exercises<br>• Ch. 20 Reading Quizzes<br>Ch. 20 Exercises |
| **Week 7** | Ch. 21 | • How do stars form? | • How do solar systems form? | • Ch. 21 Reading Quizzes<br>• Ch. 21 Exercises |
| **Week 8** | Ch. 22<br>Ch. 23 | • The aging of a low mass star<br>• The death of a low mass star | • The aging of a high mass star<br>• The death of a high mass star | • Ch. 22 Reading Quizzes<br>• Ch. 23 Reading Quizzes<br>• Ch. 23 Exercises |
| **Spring Break** | | | | |

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| **Week 9** | Midterm Exam (Ch. 15-23) | | | |
| **Week 10** | Ch. 24 | • What is relativity? | • What are black holes? | • Ch. 24 Reading Quizzes<br>• Ch. 24 Exercises |
| **Week 11** | Ch. 26<br>Ch. 25<br>*Note: Chapter order is backward | • What is a galaxy?<br>• What types of galaxies exist? | • What shape is the Milky Way galaxy?<br>• How do we know so much about the Milky Way? | • Ch. 26 Reading Quizzes<br>• Ch. 26 Exercises<br>• Ch. 25 Reading Quizzes<br>• Ch. 25 Exercises |
| **Week 12** | Chapter Test: Ch 24-26 | | | |
| **Week 13** | Ch. 28 | • Do galaxies grow? | • What makes a galaxy?<br>• Where are most galaxies? | • Ch. 28 Reading Quizzes |
| **Week 14** | Ch. 29 | • What is the Big Bang, really? | • How will the Universe end? | • Ch. 29 Reading Quizzes |
| **Week 15** | Ch. 30 | • Are we alone in the galaxy/universe? | • Have we found extraterrestrial life? | • Ch. 30 Reading Quizzes<br>• Ch. 30 Exercises |
| **Week 16** | Final Exam: Ch 24-26, 28-30 | | | |