COURSE OUTLINE **Phys 202 006 CRN: 15140** **Spring 2025**

INTRODUCTORY ASTRONOMY & COSMOLOGY

Instructor: **Andres Jerez**: **jerez@njit.edu**
(When writing, please include course and section in the subject: Phys 202 006)

Lectures: Mondays and Wednesdays, 8:30 AM – 9:50 AM, FMH 306

Office hours: Wednesdays, 1:00 PM – 1:50 PM, TIER 408T, and by appointment.

Prerequisites: None

TEXTBOOK: There is no particular textbook required for this course. Here are two recommendations:

- Astronomy from OpenStax Access. The structure of the course will be based on this textbook. It is *free*, online and full of additional material such as links to websites and videos. The reading list in the class calendar below refers to this book.
- The Cosmic Perspective: Fundamentals, by Bennett, Donahue, Schneider, and Voit; currently in its third edition (ISBN-13: 9780134988504) and published by Pearson (any edition will do, but our knowledge about the sky increases at a very fast pace). I have used this book to prepare my courses in the past. I find that it is well written, concise, and succeeds in connecting main ideas and themes across the chapters.

CANVAS: The Learning Management System at NJIT is Canvas . Lecture notes, quizzes, homework, grades, and additional course material will be managed through Canvas.

LECTURES: It is expected that students will attend all the lectures. Attendance will be taken at all classes and exams. More than 3 unexcused absences (in total) are excessive. If you have excusable absences contact the Dean of Students. If you must withdraw from the course, do it officially through the Registrar. Do not simply stop attending and taking exams: that forces the instructor to assign a course grade of "F."

EXAMS:

In-Class Exams: There will be two in-class exams during the semester. The exam will concern with the materials covered the previous four weeks. The exams will take place in class, at the following dates and times.

- In-Class Exam 1: Wednesday, February 19th 8:30 – 9:50 AM, FMH 306
- In-Class Exam 2: Wednesday, April 2nd 8:30 – 9:50 AM, FMH 306

The general policy is that students who miss an exam will receive a score of zero for that exam. That score will be included in the calculation of your final grade. Students who anticipate an absence from a common exam should discuss their situation with their instructor **PRIOR TO** their absence. In order to be qualified to receive a "make-up" common exam score (a very rare occurrence), the student should present documentation for not being able to take the test as scheduled. As is the standard policy of NJIT, this documentation should be presented to the student's Physics 202 instructor AND to the Dean of Students dos@njit.edu - (973) 596-3466, Campus Center, Room 255. BOTH the Physics 202 instructor and Dean of Students must concur in permitting a "make-up" exam. Students who miss exams that do not present documentation within 7 days of the common exam will receive a score of zero for the exam.

In the event that the above qualification is met, a separate make-up test for the missed exam will not be offered. Instead, the portion of the final exam relevant to the contents of the missed test will be considered for giving a grade for the missed test. The instructor will evaluate the final exam questions from those chapters and normalize this portion of the student's grade for the missed exam.

Final Exam: TBD. The final exam will contain questions concerning all the topics all the semester.

QUIZZES: There will be quizzes at the end of certain lectures.

HOMEWORK: Assignments will be posted and submitted online using Canvas**.**

GRADING: Your final letter grade in Phys 202 will be based on a composite score that includes the quizzes, the in-class exams, the final exam, and the homework.

- **40%** for the two in-class exams (20% each)
- **30%** for the final exam
- **20%** for the quizzes
- **10%** for the homework

The cutoff percentages for various letter grades will be in the range of:

85% for A
80% for B+
70% for B
65% for C+
50% for C
40% for D
F below 40 %

Final grades are not negotiable: A score of 84.999999% is a B+, not an A.

NOTE: Introductory Astronomy and Cosmology (Phys 202) and Introductory Astronomy and Cosmology Laboratory (Phys 202A) are two separate courses for which you will receive two separate and independently determined grades. Moreover, you are free to beregistered for either one of these courses without being registered for the other course. If you are registered for both courses, withdrawal from one course does not mean you must withdraw from the other course.

LAST DAY TO WITHDRAW: April 7th

HONOR CODE STATEMENT: NJIT has a zero-tolerance policy for cheating of any kind and for student behavior that disrupts learning by others. Violations will be reported to the Dean of Students. The penalties range from a minimum of failure in the course plus disciplinary probation up to expulsion from NJIT. Avoid situations where your own behavior could be misinterpreted as dishonorable. **Students are required to agree to the NJIT Honor Code on each exam, assignment, quiz, etc. for the course.**

- Statement on Academic Integrity:
    - ***"Academic Integrity is the cornerstone of higher education and is central to the ideals of this course and the university. Cheating is strictly prohibited and devalues the degree that you are working on. As a member of the NJIT community, it is your responsibility to protect your educational investment by knowing and following the academic code of integrity policy that is found at: http://www5.njit.edu/policies/sites/policies/files/academic-integrity-code.pdf.***
    - *Please note that it is my professional obligation and responsibility to report any academic misconduct to the Dean of Students Office.* ***Any student found in violation of the code by cheating, plagiarizing or using any online software inappropriately will result in disciplinary action. This may include a failing grade of F, and/or suspension or dismissal from the university.*** *If you have any questions about the code of Academic Integrity, please contact the Dean of Students Office at dos@njit.edu"*
    - Examples of cheating during an examination include, but are not limited to, talking with another student, copying work from another student's work, or allowing another student to copy work from your own work. All cell phones and other electronic devices (including smart watches and headphones) are to be left in the student's backpack during examinations. A cell phone seen in someone's lap during an exam will be constituted as an attempt to cheat.
- Statement on Generative AI:

    This course expects students to work without artificial intelligence (AI) assistance in order to better develop their skills in this content area. As such, AI usage is not permitted throughout this course under any circumstance.

HELP: Contact your instructor if you are having trouble with the course; do not simply hope for a miracle and fall further behind. There is online tutoring offered by the Physics Department. For information and appointments follow this link: https://physics.njit.edu/physics-tutoring-sign-sheet

LEARNING GOALS AND OUTCOMES:

This Course meets the following learning goals:

- Understand and apply basic principles and concepts in the physical or biological sciences.
- Explain and be able to assess the relationship among assumptions, method, evidence, arguments, and theory in scientific analysis.

Learning Objectives. By the end of the semester the student is expected to:

- Know the structure of the Universe and our relative place in it.
- Describe the size and scale of the Universe
- List the basic properties of electromagnetic radiation, and recognize the information contained in it about celestial objects.
- Summarize the main properties, types, and functions of telescopes.
- Recall the properties of planets, moons, asteroids and comets
- Describe our current understanding of the formation of the Solar System
- Know that the Sun can be consider a model for stellar activity; Identify the main properties of the Sun.
- Identify the characteristics of stars, and use the Hertzsprung-Russell diagram to follow the life cycle of a star.
- Describe the structure properties of the Milky Way galaxy; list the different types of galaxies and explain their evolution.
- Describe the current understanding of the evolution of the Universe, including estimates for the age of the universe

WEEK	TOPIC
January 22nd	Introduction (Chapter 1)
January 29th	Observing the Sky (Chapters 2-4)
February 5th	Light and Telescopes (Chapters 5-6)
February 12th	Survey of the Solar System I (Chapters 7-14)
Wednesday 2/19	***Exam 1 (Chapters 1-6)***
February 26th	Survey of the Solar System I (Chapters 7-14)
March 5th	The Sun (Chapters 15-16)
March 12th	Stars (Chapters 17-18)
March 26th	Distances, Gas, and Dust in Space (Chapters 19-20)
Wednesday 4/2	***Exam 2 (Sections of Chapters 7-14 and 15-20)***
April 9th	The Life of Stars (Chapters 21-23)
April 16th	Black Holes, Curved Spacetime (Chapter 24)
April 23rd	Galaxies (Chapters 25-28)
April 30th	The Big Bang (Chapter 29)
TBD	***Final Exam (Comprehensive, all the topics of the semester)***

FIRST DAY OF CLASSES: Tuesday, January 21
LAST DAY TO WITHDRAW: Monday, April 7
SPRING BREAK: March 16 – March 22
GOOD FRIDAY, NO CLASS: Friday, April 18
FRIDAY CLASSES MEET: Wednesday, May 7
LAST DAY OF CLASSES: Wednesday, May 7
READING DAYS: Thursday, May 8, Friday, May 8
FINAL EXAM PERIOD: Monday, May 11 – Friday, May 16
FINAL GRADES DUE: May 18