Syllabus for Physics 320-001: Astronomy and Astrophysics I
NJIT – Fall 2025

Dr. Gareth Perry Physics Department, Center for Solar-Terrestrial Research
Office: Microelectronics Center (MIC) 206
Phone: 973-596-5802
E-mail: gperry@njit.edu
Zoom: https://njit-edu.zoom.us/my/**gperry**

Office Hours: Tuesdays 9 – 10 am, Fridays 3 – 4 pm, or by appointment.

Course Website: The course's Canvas page will be the main source of information and communication outside of the classroom.

Course Description

PHYS 320: Astronomy and Astrophysics I is a quantitative introductory course on the astronomy of the Sun, Earth, and solar system. It emphasizes the underlying physical principles. Topics include celestial mechanics, planetary atmospheres, exoplanets, and the physics of comets, asteroids, and meteorites. The course focuses on using fundamental physics to reason about the motion, structure, atmosphere, energy, and magnetism of the Sun, planets, and satellites.

General Information

- **Course Title:** Astronomy and Astrophysics I
- **Course Number:** PHYS 320
- **Prerequisites:** A grade of **C** or better in **PHYS 121** (Physics II).
- **Lectures:** Tuesdays and Fridays from 1:00 PM to 2:20 PM in FMH 403.

Course Materials

- **Required Textbook:** *Introduction to Modern Astrophysics, 2nd Edition* by Carroll & Ostlie, ISBN: 978-0805304022. This book is also used for the follow-up course, PHYS 321.

Course Expectations

- **Attendance and Participation:** Students are expected to attend all lectures and participate actively in class discussions.
- **Homework:** Assignments will be posted regularly and are a critical part of the learning process. Students are expected to complete and submit all homework on time. Collaboration on concepts is encouraged, but all submitted work must be your own.
- **Exams:** Students are required to take both in-class exams and the final exam at the scheduled times.
- **Academic Integrity:** All work submitted in this course must be original and adhere to NJIT's honor code. Any form of cheating or plagiarism will result in disciplinary action.

Furthermore, you can expect me to:

- Treat each student with dignity and respect.
- Promote and support a safe and nurturing learning environment.
- Be punctual and use class time effectively.
- Work to make each lecture effective and impactful.
- Be available to student inquiries, comments, and concerns during office hours.
- Be available, as much as possible, for ad hoc appointments for students outside of normal office hours.

Grading and Exams

The final grade is typically based on the following breakdown, though exact weights may vary by instructor:

- **Two In-class Exams:** 30% (15% each)
- **Final Exam:** 30%
- **Homework/Assignments:** 40%

Letter Grade Cutoffs

≥85%	A
≥80%	B+
≥70%	B
≥65%	C+
≥55%	C
≥50%	D
<50%	F

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.

Generative AI

Generative AI can be a valuable learning tool in this class by assisting with brainstorming, clarifying concepts, and providing feedback on drafts. It can help students explore ideas, refine their understanding, and enhance critical thinking. However, it should not be used to complete assigned work, ensuring authentic learning and integrity.

Honor Code Violations or Disruptive Behavior

NJIT has a zero-tolerance policy for cheating of any kind and for disruptive student behavior. Violations will be reported to and judged by the Dean of Students. The penalties range from 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.
- Turn off all phones, wireless devices, laptops, and messaging devices, etc.., during quizzes and exams unless instructed otherwise.
- Please refrain from eating and drinking during lecture or create noise in class that interferes with the work of other students or instructors.
- Do not contact any “tutoring services” for help during an exam. This is strictly forbidden.

Missed Assignment and Exams

The general policy is that students who miss an exam or assignment will receive a score of zero for that exam or assignment. That score will be included in the calculation of their final grade. Students who anticipate an absence from an exam or assignment should discuss their situation with the Dean of Students and their Instructor prior to their absence. To receive an "excused absence" for the exam, the student must present documentation to the Dean of Students and/or their instructor justifying their absence. The Instructor and the Dean of Students must concur in permitting an "excused absence" for the exam.

Student Absences for Religious Observations

NJIT is committed to supporting students observing religious holidays. Students must notify their instructors in writing of any conflicts between course requirements and religious observances, ideally by the end of the second week of classes and no later than two weeks before the anticipated absence. All instructors are required to provide academically reasonable accommodations, allowing students to complete missed assignments, exams, quizzes, or other coursework within the term. Instructors are encouraged to consider the NJIT religious holiday calendar and exercise cultural sensitivity when scheduling assessments or major assignments. All instructors must ensure that students are not penalized for properly documented absences and maintain confidentiality regarding religious observances. For questions or additional guidance, please review the policy or contact the Office of Inclusive Excellence at inclusiveexcellence@njit.edu.

Class Schedule

We will try our best to adhere to this schedule; however, changes will be made as needed. Additionally, there are likely to be a few virtual and/or guest lectures during the semester because of my travel schedule. The class will be given ample notification about these lectures.

- **Lecture 1:** Sept 2: Introduction to the Solar System (Ch 1)
- **Lecture 2:** Sept 5: Astronomical Distances (Ch 1)
- **Lecture 3:** Sept 9: Nature of Light (Ch 2)
- **Lecture 4:** Sept 12: Kepler's Laws and Newtonian Mechanics (Ch 2)
- **Lecture 5:** Sept 16: Telescopes and Detectors (Ch 6)
- **Lecture 6:** Sept 19: Telescopes and Detectors (Ch 6)
- **Lecture 7:** Sept 23: Terrestrial Planets (Ch 12)
- **Lecture 8:** Sept 26: Review for Exam 1

- **Lecture 9:** Sept 30: **Exam 1**
- **Lecture 10:** Oct 3: Physical Processes in the Solar System (Ch 7)
- **Lecture 11:** Oct 7: Physical Processes in the Solar System (Ch 7)
- **Lecture 12:** Oct 10: Jovian Planets (Ch 18)
- **Lecture 13:** Oct 14: Jovian Planets (Ch 18)
- **Lecture 14:** Oct 17: Jovian Planets (Ch 18)
- **Lecture 15:** Oct 21: The Sun's Interior and Atmosphere (Ch 19)
- **Lecture 16:** Oct 24: Solar Activity and Magnetism (Ch 19)
- **Lecture 17:** Oct 28: Review for Exam 2
- **Lecture 18:** Oct 31: **Exam 2**
- **Lecture 19:** Nov 4: The Active Sun and Space Weather (Ch 19)
- **Lecture 20:** Nov 7: Solar System Formation (Ch 20)
- **Lecture 21:** Nov 11: Solar System Formation (Ch 20)
- **Lecture 22:** Nov 14: Exoplanets (Ch 11)
- **Lecture 23:** Nov 18: Exoplanets (Ch 11)
- **Lecture 24:** Nov 21: Special Topics
- **Lecture 25:** Nov 25: Special Topics
- **Lecture 26:** Dec 2: Special Topics
- **Lecture 27:** Dec 5: Review for Final Exam
- **Lecture 28:** Dec 9: Review for Final Exam