

0702P150

Introduction to Astronomy

Instructor: Ozeas Costa

Time: Monday through Friday (June 15, 2020-July 17, 2020)

Office Hours: 2 hours (according to the teaching schedule)

Contact Hours: 60 (50 minutes each)

Credits: 4

Location: Huiquan Building

Office: Huiquan Building 518

Course Description

The main emphasis of Introduction to Astronomy will be on the newest discoveries in astronomy and the latest developments in space exploration. This course offers a general survey of many topics in modern astronomy. We discuss our location in the universe, the Solar System and its planetary bodies, how they orbit the Sun, and their major properties. We explore how thousands of exoplanets have been discovered in other planetary systems, and if alien life is possible on those planets. We describe the mode of operation of telescope technology on the biggest observatories on earth. We explain the properties of stars, and their evolution from nebulae to final objects such as black holes. We distinguish between the different morphologies of galaxies and explore their properties. We discuss the big bang and the birth of the universe and explore potential scenarios for the end of the universe. We investigate dark matter and dark energy, and the roles they play in the universe expansion. By the end of this course, students should have a clear understanding of how our universe works, and how astronomical discovery is linked to the technical and cultural progress of human civilization.

Required Textbook(s)

The Cosmic Perspective Fundamentals, 2nd edition (2016), by J. Bennet, M. Donahue, N. Schneider, M. Voit. Publisher: Pearson. ISBN-13: 978-0133889567.

Prerequisites

No prerequisites

Course Hours

The course has 25 class sessions in total. Each class session is 120 minutes in length. The course meets from Monday to Friday.

Course Schedule

Please note: the schedule is meant to give an overview of the major concepts in this course. Changes may occur in the schedule as needed to aid in the student's development.

Week 1

Lecture 1: A Modern View of the Universe (Ch 1)

Lecture 2: Understanding the Sky – Seasons, Moon, Planetary Motion (Ch 2)

Lecture 3: Changes in Our Perspective – Universe, Telescopes, Gravity (Ch 3)

Lecture 4: Hunting the Edge of Space – Part 1 (NOVA-PBS)

Group Exercise #1: Astronomical Measurements (sizes, distances, mass, motion)

Week 2

Lecture 5: The Solar System (Ch 4)

Lecture 6: The Terrestrial Planets (Ch 5)

Lecture 7: The Outer Solar System (Ch 6)

Lecture 8: Origins – Earth is Born (NOVA-PBS)

Group Exercise #2: Terrestrial and celestial coordinates; seasons and the ecliptic

Week 3

Lecture 9: Extrasolar Planets (Ch 7)

Lecture 10: The Sun and other Stars (Ch 8)

Lecture 11: Stellar Lifecycles (Ch 9)

Mid-Term Exam (Chapters 1 to 9)

Group Exercise #3: Searching extrasolar planets; exoplanet radial velocity and transit

Week 4

Lecture 12: White Dwarfs, Neutron Stars, Black Holes (Ch 10)

Lecture 13: The Milky Way and Other Galaxies (Ch 11)

Lecture 14: Cosmic Distances and Hubble's Law (Ch 12)

Lecture 15: Big Bang Theory and the Birth of the Universe (Ch 13)

Group Exercise #4: Spectrum, spectral classification, and luminosity of distant stars

Week 5

Lecture 16: Dark Matter and Dark Energy (Ch 14)

Lecture 17: Hunting the Edge of Space – Part 2 (NOVA-PBS)

Lecture 18: Life in the Universe (Ch 15)

Lecture 19: Origins – How Life Began (NOVA-PBS)

Cumulative Final Exam

Course Requirements

- Attendance will be taken at the beginning of each class.
- Students are expected to read the required readings prior to the class session in which they are discussed.
- Class Conduct: Consistent, respectful and informed participation is expected from every student in the course. This includes: Respectful discussion that avoids personal history; No email or Internet usage during class; Cell phones turned off when class begins.

Grading Policy

Your final grade is based on the following components:

Type	Percentage
Chapter Quizzes	20% of grade
Group Exercises	25% of grade
Midterm Exam	25% of grade
Final Exam	30% of grade
Total	100%

Grading Scale

The instructor will use the grading system as applied by JNU:

Definition	Letter Grade	Score
Excellent	A	90~100
Good	B	80~89
Satisfactory	C	70~79
Poor	D	60~69
Failed	E	Below 60

Attendance

Attendance is mandatory at all classes. It will be recorded each class and forms part of students' participation record. Students should inform the instructor at the earliest opportunity if they need to ask for a leave. All absences may have negative effect on students' final grades. Any students with more than three unexcused absences will automatically fail the course.

Academic Integrity

As members of the Jinan University academic community, students are expected to be honest in all of their academic coursework and activities. Academic dishonesty, includes (but is not limited to) cheating on assignments or examinations; plagiarizing, i.e., misrepresenting as one's own work any work done by another; submitting the same paper, or a substantially similar paper, to meet the requirements of more than one course without the approval and consent of the instructors concerned; or sabotaging other students' work within these general definitions. Instructors, however, determine what constitutes academic misconduct in the courses they teach. Students found guilty of academic misconduct in any portion of the academic work face penalties that range from the lowering of their course grade to receiving a failing grade (E) in the course.