

PHYS1006 Astronomy for Beginners (L1)

Course Outline- Summer 2021

1. Instructor

L1

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2. Teaching Assistants

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3. Meeting Time and Venue

Lectures:

L1

Time: Tue 10:00 - 12:20, Thu 10:00 - 12:20

Venue: Online

4. Course Description

PHYS 1006 Astronomy for Beginners [3 Credit(s)]

For students with no physics background. Introduction to our Universe; observation in astronomy; origin of modern astronomy. Newton's law of motions; gravity; light, atoms and telescope. The Sun; stellar formation and evolution; white dwarfs, neutron stars and black holes. The Milky way Galaxy; Normal galaxies, active galaxies and supermassive black holes. Foundation of modern cosmology; dark matter, dark energy and the fate of the Universe; the beginning of time. Exclusion(s): Level 3 or above in HKDSE 1/2x Physics OR HKDSE 1x Physics, a passing grade in AL/AS Physics, PHYS 1001, PHYS 1002, PHYS 4054

5. Intended Learning Outcomes

Students who successfully complete this course should be able to:

1. Summarize basic sky phenomena, including seasons and phases of the Moon
2. Describe and explain the general properties of stars, how we measure these properties
3. Summarize stellar evolution and the birth-to-death lives of both low- and high-mass stars
4. Summarize the end points of stellar evolution: white dwarfs, neutron stars, and black holes
5. Describe how we determine key parameters such as galactic distances and age, and galaxy
6. Summarize the evidences for dark matter and dark energy
7. Describe what the Hubble law is
8. Apply basic physical laws to calculate motions of planets

6. Assessment Scheme

<u>Assessment</u>	<u>Assessing Course ILOs</u>
5% by in-class PRS quizzes	1, 2, 3, 4, 5, 6, 7, 8
38% by midterm exam (2 hours)	1, 8
57% by final exam (3 hours)	1, 2, 3, 4, 5, 6, 7, 8

7. Student Learning Resources

i. Lecture Notes

ii. Reference Books:

- Astronomy: A Beginner's Guide to the Universe (7th Edition), Eric Chaisson and Steve McMillan, Pearson
- Astronomy Today (8th Edition), Eric Chaisson and Steve McMillan, Pearson
- Astronomy: The Universe at a Glance (1st Edition), Eric Chaisson and Steve McMillan, Pearson

8. Teaching and Learning Activities

Lecture: 5 hours / week (CILOs 1 – 8)

9. Course Schedule

Lecture 1: The Birth of Modern Astronomy

Lecture 2: The Physics of Astronomy --- Gravitation, Matter, and Light

Lecture 3: The Earth, the Moon, and the Sun

Lecture 4: An Inventory of the Solar System

Lecture 5: The Sun

Lecture 6: Measuring the Stars --- Giants, Dwarfs, and the Main Sequence

Lecture 7: Stellar Evolution

Lecture 8: Neutron Stars and Black Holes

Lecture 9: The Milky Way Galaxy

Lecture 10: Galaxies and Dark Matter --- The Large-Scale Structure of the Cosmos

Lecture 11: Cosmology --- The Big Bang and the Fate of the Universe

Lecture 12: Life in the Universe --- Are We Alone?