Astronomy 405: Introduction to cosmology
Section A01, Spring 2025

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Course lecture notes and assignments are available on brightspace.

Lectures will take place in person on Mondays and Thursdays 10.00 – 11.20am in Elliot 161. Office hours are by appointment.

The course material is organised into seven lectures that we will cover throughout the semester. These are available in brightspace as PDFs.

Course text: Introduction to cosmology by Barbara Ryden. See over for additional reading.

Course outline:

Topic	Description	Textbook
1	A mathematical model of the universe	Chapters 3 to 6 inclusive
2	Measuring the universe	Chapter 7
3	The cosmic microwave background	Chapter 9
4	Big Bang Nucleosynthesis	Chapter 10
5	Dark Matter in the universe	Chapter 8
6	Large-scale structure	Chapter 12
7	Lambda	Chapters 4 and 6

Course assessment:
Assignments: 15%
Mid-term exams: 15+15%
Final exam: 55%

Six assignments will be issued through the semester. Assignments will typically be due one week after the issue date. Late assignments will not be accepted. The first mid-term exam will take place in class at 10am on Thursday February 13th, the second mid-term will take place in class at 10am on Monday March 24th.

Use of calculators: Any non-communicating calculator is acceptable.

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Additional reading: not compulsory, just useful. All texts should be available in the UVic library

1) Carrol and Ostlie: An Introduction to Modern Astrophysics (excellent general textbook).

2) Peebles: Physical Cosmology (excellent general textbook).

3) Gunn, Longair and Rees: Observational Cosmology, 1978 Saas-Fe conference proceedings (good description of basic cosmological ideas, some sections are rather dated).

4) Rees: Perspectives in Astrophysical Cosmology (though not employed directly in the course, this book provides excellent additional reading).

5) Mo, van den Bosch and White: Galaxy formation and evolution. Very comprehensive graduate text.

6) Weinberg: The First Three Minutes (excellent reading material for early Universe physics).

7) Berry: Principles of Cosmology and Gravitation (a good introductory text for cosmology and GR).