

ASTR422/ASTR332 THEORETICAL AND OBSERVATIONAL COSMOLOGY

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ASSESSMENT:

- 65% final examination
- 20% test
- 10% pass/fail problem sets (2 problem sets per term)
- 5% tutorial attendance

DESCRIPTION:

This course is an account of modern cosmology and concerns the nature and evolution of the universe. Our aim is that, on completion, you will have a good introduction to observational and theoretical cosmology. Specific topics will include:

- Observational Overview: Homogeneity and Isotropy; Expansion of the Universe
- General Relativity
- Simple Cosmological Models: Hubble's Law; Expansion and redshift; Contents of the Universe.
- Observational Parameters: Expansion rate; Density parameter
- The hot big bang: Phase transitions and thermal history; Decoupling and recombination; Primordial nucleosynthesis
- CMB fluctuations
- Inflation

Required Textbook

- Modern cosmology by Scott Dodelson and Fabian Schmidt, 2nd ed., 2020.

Recommended Reading

- Particle Cosmology & Astrophysics by Dan Hooper, 2024.
- Cosmology by Daniel Baumann, CUP, 2022.
- A First Course in General Relativity by B. Schutz; 3rd Edition; CUP, 2022.
- Introduction to Cosmology by Barbra Ryden; 2nd Edition, CUP, 2016.
- Cosmology by Stephen Weinberg; Oxford Univ. Press, 2008. (List of corrections at <http://zippy.ph.utexas.edu/~weinberg/corrections.html>)