

ASTR422/ASTR332 THEORETICAL AND OBSERVATIONAL COSMOLOGY

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ASSESSMENT:

60% final examination

20% test

20% problem sets (2 problem sets per term)

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
- Structure formation: CMB fluctuations; Evolution of density perturbations; formation of large-scale structure.
- Inflation

Textbooks Required Texts

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

Recommended Reading

B. Schutz; A First Course in General Relativity; 3rd Edition; CUP, 2022.

A. Liddle; [An introduction to modern cosmology](#); 2nd Edition; Wiley, 2003.

Weinberg; Cosmology; Oxford Univ. Press, 2008 (List of corrections at: <http://zippy.ph.utexas.edu/~weinberg/corrections.html>)