

# INTRODUCTION TO ASTROPHYSICS

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This course is an introduction to astrophysics for 3rd year undergraduate Physics students.

## **Textbooks:**

*Basic Astrophysics* by Dan Maoz

*The Physical Universe: Introduction to Astronomy* by Frank Shu

*Principles of Cosmology and Gravitation* by Michael Berry

## **Course Requirements:**

Weekly problem sets will be distributed. There will be a written examination following the end of the semester.

# SYLLABUS

## **Basic Observations of Stars:**

Stellar Distances

Stellar Luminosities, Radii & Temperatures

Binary Stars & Masses

Spectral Classification

Hertzsprung-Russell Diagram

## **Stellar Structure:**

Hydrostatic Equilibrium

Energy Transport

Nuclear Energy Generation

Scaling Relations

## **Stellar Evolution & Compact Objects:**

Red Giants  
White Dwarfs  
Supernovae & Neutron Stars  
Pulsars & Supernova Remnants  
Black Holes

## **Interstellar Medium:**

Diffuse & Dense Clouds  
HII Regions, Emission Lines  
Cloud Collapse & Star Formation

## **Galaxies:**

Milky Way  
Galaxy Types & Stellar Populations  
Active Galaxies, Quasars  
Galaxy Clusters

## **Cosmology:**

Hubble Expansion  
Cosmological Principles  
Redshift  
Friedmann Equations  
Dark Matter & Dark Energy

## **Early Universe:**

Cosmic Background Radiation  
Big Bang Nucleosynthesis  
Fluctuations  
Inflation