SYLLABUS
PHYS 4650 Introduction to Modern Astrophysics
Fall 2026

Professor: Dr. Ohad Shemmer
E-mail: ohad@unt.edu
Phone: 940-369-8110
Office: EESAT-220C
Office Hours: R 10:00-11:00, or by appointment
Class: TR 11:10–12:30 (Phys 116)
Recitation: R 1:50–2:45 (Phys 116)

Prerequisites: PHYS 3010

Text Book: "An Introduction to Modern Astrophysics", B. W. Carroll and D. A. Ostlie (Pearson, Addison Wesley, 2nd. edition, 2007).

Course Content: This course provides an introduction to the basic concepts and methods of modern astrophysics and cosmology. Topics include the energy source of the Sun, stellar structure and evolution, black holes, as well as the structure and fate of the Universe.

Exams: There will be a mid-term and a final examination.

Homework: Homework sets will be assigned weekly.

Project: In-class presentation ($\sim$ 15 minutes) on an assigned topic. Selected topics include: Supernovae, Gamma-Ray Bursts, Tidal Disruption Events, Active Galactic Nuclei, Extrasolar Planets, Cosmic Microwave Background Radiation, Intergalactic Medium, Multi-Messenger Astrophysics. Assigned topic must be selected by 9/17/2026.

Grading:

Homework	25%
Project	25%
Mid-Term Exam[a]	20%
Comprehensive Final Exam[b]	30%
Total	**100%**

[a] on 10/8/2026, 11:10am–12:30pm
[b] on 12/10/2026, 10:30am–12:30pm

SCHEDULE

Week	Topic
Aug. 17	Celestial Mechanics
Aug. 24	Light and Telescopes
Aug. 31	The Interaction of Light and Matter
Sep. 7	The Classification of Stellar Spectra
Sep. 14	The Energy Source of the Sun
Sep. 21	Stellar Structure
Sep. 28	Stellar Parameters
Oct. 5	The Interstellar Medium and Star Formation
Oct. 12	Stellar Evolution
Oct. 19	White Dwarfs, Neutron Stars, and Black Holes
Oct. 26	The Milky Way Galaxy
Nov. 2	Galaxies: Structure and Evolution
Nov. 9	Active Galaxies[1]
Nov. 16	Cosmology[1]
Nov. 30	Structure and Evolution of the Universe[1]

[1] Including presentations of assigned projects