

# ASTR 210

## Introduction to Astrophysics

### Syllabus

**Spring 2021**

**Prerequisites:** PHYS 160 (University Physics)

**Credits:** 3

**Date and Time:** 09:00 AM – 10:15 AM, Tuesday and Thursday

**Location:** Blackboard Collaborative Ultra, Synchronous

**Instructor:** Prof. Jie Zhang

**Contact Info:** [jzhang7@gmu.edu](mailto:jzhang7@gmu.edu) (e-mail)

**Office Hour:** 2:00 PM to 3:00 PM, Thursday, or by appointment

**Office:** Room 257, Planetary Hall

#### **Catalog Description:**

Introduction to astrophysics for scientists. Topics include astronomical measurement, celestial mechanics, electromagnetic radiation, stellar structure and evolution, the interstellar medium, galaxies, and a selection of topics at the forefront of astrophysics including space physics, exoplanets, galaxies, and cosmology.

#### **Course Objectives:**

1. Develop physical understanding of astrophysical objects and processes
2. Develop quantitative problem-solving skills on astrophysical objects and processes
3. Prepare for upper-level coursework and/or research experiences in astronomy and astrophysics.

**Text Book (required):** "Foundations of Astrophysics", by Barbara Ryden and Bradley M. Peterson, Addison-Wesley, 2009. ISBN-13: 978-0-321-59558-4. ISBN-10: 0-321-59558-0

#### **Course Content:**

CH1: Early Astronomy  
CH2: Emergence of Modern Astronomy  
CH3: Orbital Mechanics  
CH4: The Earth-Moon System  
CH5: Interaction of Radiation and Matter  
CH13: Properties of Stars  
CH14: Stellar Atmosphere  
CH15: Stellar Interiors  
CH17: Formation and Evolution of Stars  
CH18: Stellar Remnants  
CH19: Our Galaxy  
CH20: Galaxies

**Homework:** There are weekly assignments of homework, each of which consists of 2 to 5 short questions that require quantitative reasoning and/or proof. It will be assigned on Thursdays, and due at the beginning of class on the next Tuesdays. Homework is due in Blackboard Dropbox through uploading a single digitized file, such as in PDF format. You can take pictures or scan your written homework sheets, and convert them into PDF format, and combine them into a single file. The homework will be graded and returned to you through Blackboard.

**Exams:** There will be one midterm and one final exam. Both are take-home and open-book exams.

**Grades:** Homework (60%), Midterm (15%), Final Exam (25%)

**Class URL:** <https://mymasonportal.gmu.edu/>