

**George Mason University – Office of the Registrar  
Form**

**Undergraduate Course Approval**

Please complete this form and attach a copy of the syllabus and catalog description for new courses. Forward the form and attachments to your departmental curriculum committee for approval, and then to your College/School curriculum committee, or Dean's office, for final approval. The approved form should then be forwarded to the Academic Scheduling Office, MS 3D1. This form is for **undergraduate course approval only**. Please see the Provost Office/Graduate Council website to obtain a copy of the Graduate Course Approval Form and for details about the graduate course approval process.

**Note:** Colleges and Schools are responsible for submitting new or modified catalog descriptions (35 words or less, using catalog format) to Creative Services by deadlines outlined in the yearly Catalog production calendar.

**Please indicate:** New \_\_\_\_\_ **Modify** X **Delete** \_\_\_\_\_

**Department/Unit:** Physics and Astronomy **Course Subject/Number** ASTR 111

**Submitted by:** Joseph Weingartner **Ext:** 3-4596 **Email:** jweinga1@gmu.edu

**Course Title:** Introductory Astronomy: The Solar System

**Effective Term** (New/Modified Courses only): F 07 **Final Term** (deleted courses only): \_\_\_\_\_

**Credit Hours:** (Fixed) 3 (Var.) \_\_\_\_\_ to \_\_\_\_\_ **Grade Type** (check one): X Regular undergrad (A, B, C, etc.)  
\_\_\_\_\_ Satisfactory/No Credit only  
\_\_\_\_\_ Special undergrad (A, B, C, etc. + IP)

**Repeat Status\*** (check one): \_\_\_\_\_ NR-Not repeatable \_\_\_\_\_ RD-Repeatable within degree \_\_\_\_\_ RT-Repeatable within term

**\*Note:** Used only for special topics, independent study, or internships courses **Total Number of Hours Allowed:** \_\_\_\_\_

**Schedule Type Code(s):** 1. LEC LEC=Lecture SEM=Seminar STU=Studio INT=Internship IND=Independent Study  
2. \_\_\_\_\_ LAB=Lab RCT=Recitation (second code used only for courses with Lab or Rct component)

**Prereq** \_\_\_\_\_ **Coreq** \_\_\_\_\_ (check one): \_\_\_\_\_

**Note:** Modified courses - review prereq or coreq for necessary changes; Deleted courses - review other courses to correct prereqs that list the deleted course.

**Description of Modification** (for modified courses): Change title from "Introduction to Modern Astronomy I" to "Introductory Astronomy: The Solar System"

**Special Instructions** (major/college/class code restrictions, if needed): \_\_\_\_\_

**Approval Signatures:**

**Department or Unit:** Robert Shulich **Date:** 10/18/06  
(Signature)

**College/School Committee:** \_\_\_\_\_ **Date:** \_\_\_\_\_  
(Signature)

# ASTR 111: Introduction to Modern Astronomy I

## Lectures

Section: 003

Place: Innovation Hall, room 103

Time: Mondays, 7:20–10:00 pm

Lecture notes on the web at [www.physics.gmu.edu/~joe/ASTR111.html](http://www.physics.gmu.edu/~joe/ASTR111.html)

## Instructor

Joe Weingartner

Science and Technology I, room 363B

[joe@physics.gmu.edu](mailto:joe@physics.gmu.edu)

703-993-4596

Office hours: MW 6-7pm or by appointment

## Course Goals

- To understand the structure of the universe and the nature of its constituents. In ASTR 111, we will focus largely on the solar system. The Galaxy and beyond will be covered in ASTR 113.
- To understand how the observed features of the solar system follow from basic physical principles.
- To understand how scientists have deduced the nature of the celestial objects. What are our sources of information, and how can we learn so much about these distant objects with the limited information available?

## Course Textbook

*Universe* (7<sup>th</sup> ed), R.A. Freedman & W.J. Kaufmann (W.H. Freeman)

## Evaluation

- 1-hour exam during class Sep 27 (20%)
- 1-hour exam during class Oct 25 (20%)
- 1-hour exam during class Nov 22 (20%)
- Homework (10%)
- Final exam (30%)

Your letter grade for the course will depend on your total percentage grade as follows:

A+: 96–100

A: 91–95

A-: 86–90

B+: 81–85

B: 76–80

B-: 71–75

C+: 66–70

C: 61–65

C-: 56–60

D: 50–55

F: 0–49

## **Exam Information and Policies**

- The final exam will take place on Dec 13 from 7:30–10:15 pm in Innovation Hall room 103 (the same room as the lectures). You must take the final exam at the scheduled time. There will be no early or make-up final exams.
- Make-up exams will be available for the first three exams only in the following situations:
  - Illness or a medical emergency, in which case you must inform me no later than 2 days after the exam and present me with a note signed by a doctor no later than 1 week after the exam.
  - An approved GMU-sponsored activity, in which case you must present me with a note signed by the GMU activity coordinator at least 1 week before the exam.
- You must arrive on-time for exams. If you arrive late, you may be denied entry to the classroom, in which case you will receive a grade of zero on the exam.
- You must bring a scantron sheet, photo ID, and #2 pencil to all exams.

## **How to Succeed in this Course**

Active engagement in class is most important. Come to each class, pay attention, make notes of what you don't understand, and ask for help. The lecture notes on the web are provided so that you don't have to write furiously during class, but they do not come close to telling the full story. You probably will not understand much if you just read the notes at home without attending class. I suggest that you print out the notes before class and take additional notes in the margin during class. Review these within a week after class and ask me if you don't understand something.

The role of the textbook is to reinforce material that we cover in class, by providing a somewhat different perspective. The book contains many details that we will not discuss in class; you may skip over these. The best time to read a section from the book is just after we've covered that material in class. Note that some of the class material will not be found in the book. Reading both the online lecture notes and the book is no substitute for active engagement in class.

# Course Outline

(Chapters from text indicated in parentheses)

1. Overview of the Structure of the Universe (Ch 1, 7.1)
2. Surveying the Solar System (Ch 2.2 through 2.6, 3.1 through 3.3, 3.6, 4.1 through 4.3, 4.5)
3. Celestial Mechanics (Ch 4.4, 4.6, 4.7)
4. Some Basic Physics (Ch 5.1 through 5.8)
5. Telescopes (Ch 6)
6. Earth: Surface and Interior (Ch 9.1 through 9.3, 4.8)
7. Earth: Atmosphere (Ch 9.1, 9.5 through 9.7)
8. The Terrestrial Planets (Ch 7.3, 7.4, 7.6, 10.1, 10.3 through 10.5, 5.9, 11.1 through 11.3, 12.1, 12.3 through 12.6, 13.3 through 13.5, 13.8)
9. The Giant Planets (Ch 14.1, 14.2, 14.4, 14.6, 16.1 through 16.4)
10. Satellites and Rings of the Giant Planets (Ch 7.2, 14.9 through 14.12, 15.1 through 15.4, 15.6 through 15.10, 16.6 through 16.8)
11. Asteroids, Comets, and the Kuiper Belt (Ch 7.5, 16.9, 17.1 through 17.4, 17.7 through 17.9)
12. Formation of the Solar System (Ch 7.8, 8.1 through 8.5)
13. Disks and Planets around Other Stars (Ch 8.6)

## Memo re. modification to ASTR 111

### Catalog description:

ASTR 111 Introductory Astronomy: The Solar System (3:3:0)  
ASTR 111  
and 112 can be used to fulfil a 4-credit lab science requirement; not for physics majors. Topics include history of astronomy, evolution of the solar system, properties of planets, scientific method, critical thinking, nature of light, and principles of telescope design.

### Course objectives:

1. Understand the basic principles of astronomy
2. Understand the structure of the solar system and nature of its constituents.
3. Understand the scientific method.

### Necessity for the revision:

ASTR 111/112 and ASTR 113/114 are each self-contained. It is not necessary to take ASTR 111/112 before ASTR 113/114. ASTR 111 is not, and has not been, a prereq for ASTR 113. The current names, with the "I" and "II" designations, imply otherwise. The proposed names rectify this problem.

### Relationship to similar courses in the department:

No change, as no course content is changing.

### Relationship to similar courses in other departments:

Again, no change.

Anticipated change in audience and enrollment:

No anticipated change.

List of potential instructors:

1. Harold Geller
2. Jie Zhang
3. Robert Weigel
4. Peter Becker
5. Joseph Weingartner

Anticipated change in frequency at which course will be offered:

No change.

Additional resources necessitated by the revision:

None.

ASTR 111/112 plus ASTR 113/114 satisfied the previous 2-semester lab science gen ed requirement. Now, ASTR 111/112 alone will satisfy the gen ed requirement for one semester's worth of lab science.

A syllabus from a previous semester is attached. Since the course content is not changing, future syllabi will be similar.