George Mason University – Office of the Registrar **Undergraduate Course Approval Form**

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 113

Submitted by: Joseph Weingartner **Ext:** 3-4596 **Email:** jweingar1@gmu.edu

Course Title: Introductory Astronomy I: Stars, Galaxies, and the Universe

Effective Term (New/Modified Courses only): S 08 **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 course title from "Introduction to Modern Astronomy II" to above title.

Special Instructions (major/college/class code restrictions, if needed):_____

Approval Signatures:

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

College/School Committee:_____ Date:_____
(Signature)

George Mason University

ASTR 113 Foundations of Modern Astronomy

Instructor and Contact Information

Professor Opher Room 363 B Science and Technology 1

Telephone: 703-993-4571

FAX: 703-993-1269

E-mail: mopher@gmu.edu

Office Hours: T/R 16:30-17:30 & 16:30-17:30

All other meetings by appointment only.

Grading Policy

There will be 3 one-hour in-class (regular class dates/times) examinations and one 3-hour comprehensive final. NO MAKEUP EXAMS

2/3	In class one-hour examinations (30% each)	60 %
1	Comprehensive Final	40 %
		====
		100%

All examinations will be multiple choice type examinations.

Students are expected to follow the George Mason University rules of student honor. As noted in the catalog:

> "George Mason University shares in the tradition of an honor system that has existed in Virginia since 1842. The Honor Code is an integral part of university life. On the application for admission, students sign a statement agreeing to conform to and uphold the Honor Code. Therefore, students are responsible for understanding the provisions of the code. In the spirit of the code, a student's word is a declaration of good faith acceptable as truth in all academic matters. Therefore, cheating and attempted cheating, plagiarism, lying, and stealing of academic work and related materials constitute Honor Code violations. To maintain an academic community according to these standards, students and faculty must report all alleged violations of the Honor Code to the Honor Committee. Any student who has knowledge of, but does not report, an Honor Code violation may be accused of lying under the Honor Code."
>
> [Source: http://www.gmu.edu/catalog/9900/acadpol.html#honorsys]

Textbook: Universe by Freedman and Kaufmann 7th Edition

Lectures will consist of various forms of presentation material including videos, computer displays, demonstrations and transparencies. Questions are acceptable at any time during the lecture. Students should be alert during the lecture and prepared to answer queries posed as they arise.

Course Description

Covers the history of astronomy and its recent developments. Stresses the use of astronomical instruments and measuring techniques and includes the study and observation of the solar system, stars, and galaxies. Lectures are 3 hours per week.

General Course Purpose

This course serves as a one-year laboratory science course for non-science majors and as a science elective for science majors. Students are exposed to the sciences of chemistry, physics, and geology and the philosophy of science as they relate to the study of the universe and the cosmos. Students will gain a perspective of humankind's presence on a small blue planet that orbits a non-descript star that is one of billions in an ordinary galaxy.

Entry level Competencies

The course is a conceptual-based course using a minimal amount of algebra and geometry. There are no science prerequisites. Students have English composition skills at the English 111 level.

Course Objectives

1. Describe the vastness of the cosmos in terms of time, mass, and space.
2. Explain the scientific method, the philosophy of science, and the difference between science, pseudo-science, and religion as related to the study of astronomy.
3. List and describe the physical laws that govern the interaction of matter, energy, time, and space in the cosmos.
4. State how astronomers utilize electromagnetic radiation to gain the knowledge of the mechanics of the birth, life, and death of stars from the distant past.
5. Appreciate the magnitude of the scientific problem of the search for extraterrestrial life in the universe.

Major Topics to be Included

1. The history of early astronomy.
2. The solar and planetary system.
3. The physics of light, gravity, matter, energy, magnetism, radioactivity, nuclear energy, and relativity.
4. The geology of volcanism, plate tectonics, and erosion as applied to the planets.
5. The birth and death of stars and galaxies.
6. The H-R diagram for stars including the location of the main sequence, red giants and white dwarfs.
7. The "Big Bang" theory of universal creation, pulsars, neutron stars, and black holes.
8. Stellar and galactic evolution.
9. Normal and active galaxies.
10. Cosmology and life in the universe.
11. Laboratory work dealing with measuring instruments of the astronomer, and drawing conclusion from astronomical data.

Memo re. modification to ASTR 113

Catalog description:

ASTR 113 Introductory Astronomy: Stars, Galaxies, and the Universe
(3:3:0) ASTR 113 and 114 can be used to fulfil a 4-credit lab science
requirement; not for physics majors. Topics include electromagnetic
radiation, stellar evolution, interstellar medium, galaxies, cosmology,
scientific method, and critical thinking.

Course objectives:

1. Understand the basic principles of astronomy
2. Understand the structure of the universe 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. Merav Opher
3. Joseph Pesce
4. Shalom Fisher

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 113/114 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.