OFFICIAL COURSE OUTLINE INFORMATION

Students are advised to keep course outlines in personal files for future use.

<table>
<thead>
<tr>
<th>FACULTY/DEPARTMENT:</th>
<th>PHYSICS 104</th>
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<tbody>
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<td>PHYSICS</td>
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<tr>
<td>COURSE NAME/NUMBER</td>
<td>FORMER COURSE NUMBER</td>
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<tr>
<td>ASTRONOMY: THE COSMOS</td>
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**CALENDAR DESCRIPTION:**

This introductory course in astronomy focuses on the stars and universe. Topics include properties of stars, galaxies, life cycle of a star, modern theories in astronomy, and origin and evolution of the universe. Students will be given a number of laboratory exercises to supplement the material covered in class. The course will place emphasis on conceptual development rather than a rigorous mathematical treatment and is a suitable non-calculus-based laboratory science course for Arts students.

**PREREQUISITES:** Principles of MATH 11, or at least a C in Applications of MATH 11

**COREQUISITES:**

**SYNONYMOUS COURSE(S)**

(a) Replaces: 
(b) Cannot take:

**SERVICE COURSE TO:**

**TOTAL HOURS PER TERM:** 73

<table>
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<tr>
<th>STRUCTURE OF HOURS:</th>
<th>TRAINING DAY-BASED INSTRUCTION</th>
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<tr>
<td>Lectures: 43 Hrs</td>
<td>LENGTH OF COURSE:</td>
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<tr>
<td>Seminar: Hrs</td>
<td>HOURS PER DAY:</td>
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<tr>
<td>Laboratory: 30 Hrs</td>
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<tr>
<td>Field Experience: Hrs</td>
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<tr>
<td>Student Directed Learning: Hrs</td>
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<tr>
<td>Other (Specify): Hrs</td>
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**MAXIMUM ENROLLMENT:** 36

**EXPECTED FREQUENCY OF COURSE OFFERINGS:**

WILL TRANSFER CREDIT BE REQUESTED? (lower-level courses only) [ ] Yes [ ] No

WILL TRANSFER CREDIT BE REQUESTED? (upper-level requested by department) [ ] Yes [ ] No

TRANSFER CREDIT EXISTS IN BCCAT TRANSFER GUIDE: [ ] Yes [ ] No

**AUTHORIZATION SIGNATURES:**

Course Designer(s): T. Cooper; revised P. Mulhern

Chairperson: Edith Camm (Curriculum Committee)

Department Head: Revised P. Mulhern

Dean: J.D. Tunstall; revised J. Snodgrass

PAC Approval in Principle Date: PAC Final Approval Date: December 14, 2001
LEARNING OBJECTIVES / GOALS / OUTCOMES / LEARNING OUTCOMES:
To give the student an appreciation of the structure and contents of the universe, and of astronomical time-scales.
To show the student how basic laws of physics and chemistry explain the life cycle of stars and galaxies.
To introduce the student to ideas which are totally beyond our everyday experience, i.e. black holes, quasars, neutrino fluxes.
To show how astronomy is a living science which will be done by discussion of some of the latest exciting discoveries.

METHODS:
Lecture, Demonstration, Small group practice, Discussion, Audiovisual presentation, Use of models and charts.

PRIOR LEARNING ASSESSMENT RECOGNITION (PLAR):
Credit can be awarded for this course through PLAR (Please check:) ☑ Yes ☐ No

METHODS OF OBTAINING PLAR:
Initial oral discussion
Successful completion of a final exam

TEXTBOOKS, REFERENCES, MATERIALS:
[Textbook selection varies by instructor. An example of texts for this course might be:]
Astronomy: Journey to the Cosmic Frontier  John D. Fix
Any first year astronomy text

SUPPLIES / MATERIALS:

STUDENT EVALUATION:
[An example of student evaluation for this course might be:]
Laboratory Work 20%
Assignments 20%
Midterm 25%
Final 35%

COURSE CONTENT:
[Course content varies by instructor. An example of course content might be:]
Week 1 Chap 21 Surveying the heavens
Week 2 Chap 22 Analyzing starlight
Week 3 Chap 23 Double stars
Week 4 Chap 24 The stars, a celestial census
Week 5 Chap 25 Gas and dust in space
Week 6 Chap 26 The sun, structure
Week 7 Chap 27 The sun, nuclear powerhouse
Week 8 Chap 28 The birth of stars
Week 9 Chap 29 Star clusters, stellar evolution
Week 10 Chap 30 Evolution and death of stars
Week 11 Chap 31 General Relativity, curved spacetimes
Week 12 Chap 32 The milky way
Week 13 Chap 33 Galaxies
Week 14 Chap 34 Structure and evolution of the universe
Week 15 Chap 35 The big bang

LABORATORY EXPERIMENTS
Between 7 and 9 labs will be done. These will help clarify some of the more abstract concepts presented in class. Other lab periods can, clouds permitting, be used for observation.