OFFICIAL COURSE OUTLINE INFORMATION

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

Shaded headings are subject to change at the discretion of the department and the material will vary.
See course syllabus available from instructor.

<table>
<thead>
<tr>
<th>FACULTY/DEPARTMENT:</th>
<th>PHYSICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>COURSE NAME/NUMBER</td>
<td>PHYSICS 104 FORMER COURSE NUMBER</td>
</tr>
<tr>
<td>ASTRONOMY: THE COSMOS</td>
<td>4</td>
</tr>
</tbody>
</table>

CALENDAR DESCRIPTION:

An introductory course in astronomy focusing on the stars and universe. Topics include properties of stars, galaxies, life cycle of a star, modern theories in astronomy, 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: PHYSICS 103 is suggested, not required.

SYNONYMOUS COURSE(S)

(a) Replaces: 
(b) Cannot take: 

SERVICE COURSE TO:

TOTAL HOURS PER TERM: 105

STRUCTURE OF HOURS:

| Lectures:       | 60 Hrs |
| Laboratory:     | 45 Hrs |
| Seminar:        | Hrs    |
| Field Experience: | Hrs    |
| Student Directed Learning: | Hrs |
| Other (Specify): | Hrs    |

MAXIMUM ENROLLMENT: 

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): Tim Cooper  Chairperson: (Curriculum Committee)

Department Head: Tim Cooper  Dean: Don Tunstall, Ph.D.

PAC Approval in Principle Date: PAC Final Approval Date: October 23, 1996
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:

TEXTBOOKS, REFERENCES, MATERIALS:
[Textbook selection varies by instructor. An example of texts for this course might be:] Fix. Astronomy; Journey to the Cosmic Frontier.

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.