FACULTY CURRICULUM COMMITTEE
COURSE FORM

Instructions:
• Please fill out one of these forms for each course you are adding, changing, deactivating, or reactivating.
• Fill out the parts of the form specified in part B. **You must do this before your request can move forward!**
• Remember that your changes will not be implemented until the next catalog year at the earliest.
• If you have questions, start by checking the instructions on the website. Please feel free to contact the committee chairs with any remaining questions you might have.

A. CONTACT/COURSE INFORMATION.

Name: P. Chris Fragile Phone: 953-3181 Email: fragilep@cofc.edu

Department or Program: Physics & Astronomy School: SSM

Subject Acronym and Course Number: ASTR 231

Catalog Year in which changes will take effect: FALL 2014

B. TYPE OF REQUEST. Please check all that apply, then fill out the specified parts of the form.

- [ ] Add a New Course (complete parts C, D, F, G, H, I, J, K)
- [ ] Change Part of an Existing Course (complete parts C, D, E, F, G, I, J, K)
  - [ ] Course Number
  - [ ] Course Name
  - [ ] Course Description
  - [ ] Credit/Contact Hours
  - [ ] Restrictions (prerequisites, co-requisites, junior/senior standing, etc.)
- [ ] Deactivate an Existing Course (complete parts C, D, E, G, I, J, K)
- [ ] Reactivate a Previously-Deactivated Course (complete parts C, D, E, G, I, J, K)

C. RATIONALE AND EXPLANATION. Please describe your request and explain why you are making it.

The Astronomy Curriculum Committee within the Physics & Astronomy Department has decided that our department needs to add a "bridge" course within the Astrophysics degree program. This assessment is based on evidence from 4 years of offering our Astrophysics B.S. degree. Without this bridge course, too much time in our upper division classes is spent on introductory astrophysics material. We also have the problem that, with no regularly recurring astrophysics offering, students who come in during “odd” years do not have an astrophysics course available that they can take in their sophomore year. This has led many students to try to force their way through the curriculum earlier than intended, and consequently struggle. The proposed course is intended address all of these program deficiencies.

D. IMPACT ON EXISTING PROGRAMS AND COURSES. Please briefly describe the impact of your request on your own programs and courses as well other programs and courses. If another program requires the course, you must submit their written acknowledgement with this proposal. Also, the affected program must describe any change in the number of credit hours they require. Include a list of similar courses in other departments and explain any overlap.

This course will provide a recurring astrophysics offering, intended for most students to take during their sophomore year, after completing PHYS 111 & 112, but before going on to upper level astrophysics courses. By offering the course every year, students will not be caught without options or pressing to take things earlier than they should. It will also provide a common knowledge base that will prepare students for all upper level astrophysics courses.

This form was last updated on 06/03/13 and replaces all others.
To keep the total program hours at their current level, students will no longer be required to take ASTR 206, 311, or 312; for the Astrophysics B.S., they will only be required to take 2 upper-level ASTR electives (from 306, 311, 312, 413 or PHYS 412 when astrophysics related); for the Astronomy B.A., these courses will all be electives. Students will also no longer be required to take these courses in sequence.

ASTR 231 will not count toward the Physics B.S. degree.

There are no similar courses in other departments.
E. EXISTING COURSE INFORMATION. If you are proposing a new course, just leave this blank. Otherwise, please fill out all fields.

Department: School: Subject Acronym: Course Number:

Credit hours: __ lecture __ lab __ seminar __ independent study
Contact hours: __ lecture __ lab __ seminar __ independent study

Course title: Planetary Astronomy

Course description (maximum 50 words, exactly as it appears in the catalog):

Restrictions (pre-requisites, co-requisites, majors only, etc.):

Cross-listing, if any:

Is this course repeatable? □ yes □ no If yes, how many total credit hours may the student earn? ____

F. NEW COURSE INFORMATION. If you are deactivating a course, leave this blank. Otherwise, please fill out all fields. For changed courses, use boldface for the information that is changing.

Department: Physics & Astronomy School: SSM Subject Acronym: ASTR Course Number: 231

Credit hours: __3__ lecture __ lab __ seminar __ independent study
Contact hours: __3__ lecture __ lab __ seminar __ independent study

Course title: Introduction to Astrophysics

Course description (maximum 50 words, exactly as it appears in the catalog):

A general survey of fundamental astronomy. The course covers fundamental astronomy concepts, conventions, and terminology. It briefly reviews certain physical concepts, such as gravity and radiative processes, and applies them in an astrophysical context. It then introduces the basic principles required for more advanced courses: planetary, stellar, and galactic/extragalactic astrophysics.

Restrictions (pre-requisites, co-requisites, majors only, etc.):

Prerequisite: PHYS 112 or HONS 158.

If this is a newly-created course, is it intended to be the equivalent of an existing course and replace it? □ yes □ no

If so, which course? _____________

Note: You must deactivate that course by submitting an additional Course Form.

Cross-listing, if any (submit approval from relevant department):

Note: Cross-listed courses are equivalent.

Is this course repeatable? □ yes □ no If yes, how many total credit hours may the student earn? ____

Is there an activity, lab, or other fee associated with this course? □ yes □ no What is the fee? $______

This form was last updated on 06/03/13 and replaces all others.
Note: The Senate cannot approve new fees; Business Affairs will submit any such request to the Board of Trustees. The course can still be created, but the fee will not be attached until the Board has approved it.

G. COSTS. List all of the new costs or cost savings (including new faculty/staff requests, library, equipment, etc.) associated with your request.

None.

H. STUDENT LEARNING OUTCOMES AND ASSESSMENT.

<table>
<thead>
<tr>
<th>Student Learning Outcomes</th>
<th>Assessment Method and Performance Expected</th>
</tr>
</thead>
<tbody>
<tr>
<td>What will students know and be able to do when they complete the course?</td>
<td>How will each outcome be measured? Who will be assessed, when, and how often? How well should students be able to do on the assessment?</td>
</tr>
<tr>
<td>1. Students will understand and be able to apply Kepler's laws of motion to analyze orbits. Students should also understand and be able to apply Lorentz transformations to solve relativistic motion problems.</td>
<td>All students will be assessed through homework, test, and final exam questions. Students should be able to score at least 80%.</td>
</tr>
<tr>
<td>2. Students should understand basic radiative processes as they apply to astrophysics. The importance of blackbody and absorption- and emission-line spectra should be recognized.</td>
<td>All students will be assessed through homework, test, and final exam questions. Students should be able to score at least 80%.</td>
</tr>
<tr>
<td>3. Students should understand the basics of star formation, evolution, and death; they should understand the usefulness of spectral classification of stars and the importance of the HR diagram.</td>
<td>All students will be assessed through homework, test, and final exam questions. Students should be able to score at least 80%.</td>
</tr>
<tr>
<td>4. Students should understand larger scale structures in the Universe, from galaxies to clusters on up to the scale of the Universe itself.</td>
<td>All students will be assessed through homework, test, and final exam questions. Students should be able to score at least 80%.</td>
</tr>
</tbody>
</table>

How does this course align with the student learning outcomes articulated for the major, program, or general education? What program-level outcome or outcomes does it support? Is the content or skill introduced, reinforced, or demonstrated in this course?

This course will support both the Astronomy B.A. and Astrophysics B.S. degrees. For the Astronomy B.A., it supports the learning outcome that, “Students are able to answer general questions in the field of astronomy.” For the Astrophysics B.S., it supports the learning outcome that, “Students apply classical and relativistic motion principles correctly in astrophysics problems.”

Content within the astrophysics curriculum will be first introduced in this course and later reinforced in subsequent courses.

I. PROGRAM CHANGES. Will this course be added to the existing degree requirements or list of approved electives of a major, minor, or concentration?  ☒ yes  ☐ no

If yes, please attach a Change Minor and/or Change Major/Program Form as appropriate.
J. CHECKLIST.

☒ I have completed all relevant parts of the form.

☒ I have attached a cover letter that describes my request and lists all the documents I am submitting.

☐ (For new courses only) I have attached a syllabus.

☐ (For courses used in any way by other departments, including cross-listing) I have attached an acknowledgement from the relevant department.

☐ (For courses intended to fulfill a Gen Ed requirement) I have submitted the proposal to the Gen Ed committee.

☒ I have submitted one Signature Form that lists all of the different forms I am submitting.