

Eastern Illinois University
New Course Proposal
PHY 3045G, Wonders of Astronomy

Please check one: ☒ New course ☐ Revised course

PART I: CATALOG DESCRIPTION

1. **Course prefix and number, such as ART 1000:** PHY 3045G
2. **Title (may not exceed 30 characters, including spaces):** "Wonders of Astronomy"
3. **Long title, if any (may not exceed 100 characters, including spaces):**
4. **Class hours per week, lab hours per week, and credit [e.g., (3-0-3)]:** 3-0-3
5. **Term(s) to be offered:** ☒ Fall ☒ Spring ☒ Summer ☐ On demand
6. **Initial term of offering:** ☒ Fall ☐ Spring ☐ Summer **Year:** 2011
7. **Course description (not to exceed four lines):** The course introduces students to physical laws governing the Universe. Origin, evolution and the final fate of the planets, stars, galaxies and the Universe are discussed.
8. **Registration restrictions:**
 - a. **Identify any equivalent courses** (e.g., cross-listed course, non-honors version of an honors course).
 - b. **Prerequisite(s)**, including required test scores, courses, grades in courses, and technical skills. Indicate whether any prerequisite course(s) MAY be taken concurrently with the proposed/revised course.
 - c. **Who can waive the prerequisite(s)?**
☐ No one ☐ Chair ☐ Instructor ☐ Advisor ☐ Other (Please specify)
 - d. **Co-requisites** (course(s) which MUST be taken concurrently with this one):
 - e. **Repeat status:** ☒ Course may not be repeated.
☐ Course may be repeated to a maximum of _____ hours or _____ times.
 - f. **Degree, college, major(s), level, or class** to which registration in the course is restricted, if any:

The course is technology delivered, only and is available to off-campus students only. It is for students whose programs do not require PHY 1055G/56G. Credit for PHY 3045G will not be granted if the student already has credit for PHY 1055G or PHY 1095G.
 - g. **Degree, college, major(s), level, or class** to be excluded from the course, if any:
9. **Special course attributes** [cultural diversity, general education (indicate component), honors, remedial, writing centered or writing intensive] General Education – Physical Sciences – Scientific Awareness
10. **Grading methods** (check all that apply): ☒ Standard letter ☐ C/NC ☐ Audit ☐ ABC/NC ("Standard letter"—i.e., ABCDF—is assumed to be the default grading method unless the course description indicates otherwise.)
11. **Instructional delivery method:** ☐ lecture ☐ lab ☐ lecture/lab combined ☐ independent study/research
☐ internship ☐ performance ☐ practicum or clinical ☐ study abroad ☒ other

PART TWO: ASSURANCE OF STUDENT LEARNING

1. List the student learning objectives of this course:

In successfully completing this course, students will:

1. Use scientific terminology appropriately, which will make them a more informed electorate. (citizenship)
2. Demonstrate knowledge of the physical principles underlying modern astronomy. (critical thinking, citizenship)
3. Write a term paper and answer numerical-type exam questions. (writing, critical thinking)
4. Demonstrate use of scientific methods and technology. (critical thinking, citizenship)
5. Communicate a scientific understanding of many aspects of the physical universe.
6. Apply problem solving techniques and solve numerical problems in physics and other areas of science.
7. Demonstrate knowledge of the history of Astronomy in different civilizations, and articulate the difference between Astronomy and Astrology. (critical thinking, citizenship)

a. If this is a general education course, indicate which objectives are designed to help students achieve one or more of the following goals of general education and university-wide assessment:

- EIU graduates will write and speak effectively. 3.
- EIU graduates will think critically. 2,3,5,6, 7.
- EIU graduates will function as responsible citizens. 1,2,4, 7.

b. If this is a graduate-level course, indicate which objectives are designed to help students achieve established goals for learning at the graduate level: N/A

2. Identify the assignments/activities the instructor will use to determine how well students attained the learning objectives:

The course student assessment will be based on seven homework assignments, four tests, a term paper and a final exam. The students will be encouraged to actively engage into WebCT discussions.

The length of the term paper should be 2500 words, approximately. It should include abstract, introduction, main body and conclusion. The term paper will be based on student's own research on assigned topics. A list of references should be added to the end of term paper (the list of references is not included in 2500 words length limitation).

| Learning Objectives | Homework Assignments | Tests | Term paper | Final Exam |
|--|----------------------|-------|------------|------------|
| Use scientific terminology appropriately, which will make them a more informed electorate. | X | X | X | X |
| Demonstrate knowledge of the physical principles underlying modern astronomy. | X | X | X | X |
| Successfully answer numerical-type exam questions. | X | X | | X |

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|---|---|---|---|---|
| Demonstrate use of scientific methods and technology | X | X | X | X |
| Communicate a scientific understanding of many aspects of the physical universe | X | X | X | X |
| Apply problem solving techniques and solve numerical problems in physics and other areas of science. | X | X | | X |
| Demonstrate knowledge of advancement of Astronomy through history and different civilization, and difference between Astronomy and Astrology. | X | X | | X |

- 3. Explain how the instructor will determine students' grades for the course:** The following grading scale will apply: 86-100% = A; 70-85% = B; 60-69% = C; 50-59% = D; 49% or less = F.

Homework assignments: 20 %

Tests 40%

Term paper 20%

Final Exam 20%

For technology-delivered and other nontraditional-delivered courses/sections, address the following:

- a. Describe how the format/technology will be used to support and assess students' achievement of the specified learning objectives:**

The course student assessment will be based on seven homework assignments, four tests, a term paper, and a final exam. The students will be encouraged to actively engage in WebCT discussions.

- b. Describe how the integrity of student work will be assured:**

Assignments can be accessed at certain dates and must be finished within precise time intervals (90, 120, or 150 minutes). The same assignments may present different problems to different students since some numerical questions can be generated with different data sets and are offered to students on a random basis. Turnitin or other anti-plagiarism service will be used to screen term papers. The syllabus clearly cites academic integrity expectations.

- c. Describe provisions for and requirements of instructor-student and student-student interaction, including the kinds of technologies that will be used to support the interaction (e.g., e-mail, web-based discussions, computer conferences, etc.):**

The course will be WebCT based. The material will mostly be organized in two week long modules accompanying by power point notes, supplementary web links, and assignments. Instructor-student communication will be based on e-mail, telephone, and Skype or Elluminate contacts if necessary. The course announcements have been posted at the specifically designed "Information" link. A WebCT discussion board will be available to discuss any course curriculum topic. Students will be more than welcome to visit the instructor in his office.

- 4. For courses numbered 4750-4999, specify additional or more stringent requirements for students enrolling for graduate credit. These include:**

- course objectives;
- projects that require application and analysis of the course content; and
- separate methods of evaluation for undergraduate and graduate students.

5. If applicable, indicate whether this course is writing-active, writing-intensive, or writing-centered, and describe how the course satisfies the criteria for the type of writing course identified. (See Appendix *.)

PART III: OUTLINE OF THE COURSE

Provide a week-by-week outline of the course's content. Specify units of time (e.g., for a 3-0-3 course, 45 fifty-minute class periods over 15 weeks) for each major topic in the outline. Provide clear and sufficient details about content and procedures so that possible questions of overlap with other courses can be addressed. For technology-delivered or other nontraditional-delivered courses/sections, explain how the course content "units" are sufficiently equivalent to the traditional on-campus semester hour units of time described above.

Weeks 1: Introduction

Scientific Method, Understanding Seasons, Celestial Sphere, Astronomical Distances

Weeks 2: A Historical Overview

Origin of Solar System, Ptolemaic Model, Copernican Revolution,

Weeks 3 and 4: Radiation and Spectroscopy and Telescopes

Electromagnetic Spectrum, Doppler Effect, Spectral Lines, Cassegrain Telescope, Radio Astronomy

Weeks 5 and 6: Planetary Systems

Terrestrial Planets

Weeks 7 and 8: Planetary Systems II

Jovian Planets

Weeks 9 and 10: Stellar Lives and Stellar deaths

The Hertzsprung-Russell Diagram, Stellar Masses, Star Formation

Weeks 11 and 12: Galaxies

The Milky Way, Other Galaxies, Hubble's law

Weeks 13 and 14: Cosmology

Big Bang, Fate of the Universe, Dark Matter and Dark Energy

Week 15: Life in the Universe

Solar System, Search for Extraterrestrial Intelligence

PART IV: PURPOSE AND NEED

1. **Explain the department's rationale for developing and proposing the course.**

Technology delivered courses are an important part of the curriculum and are growing in their importance. The Physics Department offers an introductory Astronomy course on campus that includes a lab. We wanted to offer a technology delivered basic Astronomy course that does not compete with the on campus course but also serves a population of students. The off campus students are the target

audience for this course. We have found, through trials of a similar course, that Gen Ed offerings at the 3000 level have an audience in the BGS areas. So the marketing that was done indicated that there was a real need for an upper level Gen Ed course.

Once this was understood we went about developing a course that was technology delivered and also upper level. A technology-delivered course section provides us with the ability to reach off-campus and nontraditional students that couldn't participate in regular on-campus class offerings. It accommodates needs of nontraditional students (such as those already in workplace). There is a place for it in the BGS system as both upper level and Gen Ed. Usage of technology for course delivery does not undermine rigorousness and integrity of our education practice. Topics covered in this course span a wider range and depth than the 1055G course (though in many ways the two courses are similar). The more mature target audience will be able to critically analyze and understand the material. Special topics, not included in the 1055G course will be covered. The term paper will also allow students to delve further into a subject of their own interest. By utilizing their superior study skills, analytical skills, and knowledge base, the target audience will choose topics and effort level that make this course upper level both in quality and content.

Enough of the course material will be similar to the topics covered in PHY 1055G that it does not make sense to give credit for both courses. A student who takes PHY 1055G will miss many of the topics in the PHY 3045 course but there will also be significant overlap. The students in the 3045G course will see a higher level of rigor in their mathematical, conceptual, and content based discussions. Content is different but not enough to consider this a follow up course for PHY 1055G. A credit for PHY 3045G will not be granted if the student already has credit for PHY 1055G.

- a. **If this is a general education course, you also must indicate the segment of the general education program into which it will be placed, and describe how the course meets the requirements of that segment.** Science Awareness –Physical Science. This course will help students with the demystification of science and technology through the study of the Universe with an understanding of the techniques and technology needed for such exploration; it will also help the students to understand the future of the Earth and the Sun thus helping them to learn how to confront dilemmas that mankind will face.
 - b. **If the course or some sections of the course may be technology delivered, explain why.** This course will be technology delivered so that it can reach a wider audience. Non-traditional students and off campus students are the target audience.
- 2. Justify the level of the course and any course prerequisites, co-requisites, or registration restrictions.**

This course will be offered as an upper level course because it requires nontraditional students to critically analyze and understand the material. Special topics, not included in the 1055G, course will be covered. There will also be a rigor to this course that cannot be accomplished in the 1055G course. Such subjects as Dark Energy and Expansion/Contraction of the Universe will be addressed in the course and the students will be encouraged to tackle these and other subjects in more depth on the term paper. This will allow the students an avenue to develop a depth of knowledge in a particular area. Between breadth and depth, we feel that this course is appropriate at the 3000 level. The course is available to off-campus students only as those are the intended students.

- 3. If the course is similar to an existing course or courses, justify its development and offering.** This course is similar in some ways to PHY 1055G but covers more advanced topics and allows the student to delve deeper into the subject matter. The course is designed to reach off-campus and nontraditional students more than our PHY 1055G which has to be concurrently taken with the PHY 1056G labs. The lab associated with 1055G means that the general direction and issues covered in that course must be commensurate with lab. However, PHY 3045G will not have the lab component needed so the class is less constrained and can cover a wider variety of subject matter.
- a. **If the contents substantially duplicate those of an existing course, the new proposal should be discussed with the appropriate chairpersons, deans, or curriculum committees and their responses noted in the proposal.**
 - b. **Cite course(s) to be deleted if the new course is approved. If no deletions are planned, note the exceptional need to be met or the curricular gap to be filled.** There are no deletions planned to go along with this course. A version of this course has been tested by N. Ilic through Continuing Education, most recently as a “Special Topics” course. It does fill and Mr. Ilic has been teaching it. So there will be no additional resources required in order to offer this course.
- 4. Impact on Program(s):**
- a. **For undergraduate programs, specify whether this course will be required for a major or minor or used as an approved elective.** Not required for any major or minor.
 - b. **For graduate programs, specify whether this course will be a core requirement for all candidates in a degree or certificate program or an approved elective.**

If the proposed course changes a major, minor, or certificate program in or outside of the department, you must submit a separate proposal requesting that change along with the course proposal. Provide a copy of the existing program in the current catalog with the requested changes noted.

PART V: IMPLEMENTATION

- 1. Faculty member(s) to whom the course may be assigned:** Technology delivered section N. Ilic or any OCDI approved faculty in Physics. No on campus sections of the course are currently planned.

If this is a graduate course and the department does not currently offer a graduate program, it must document that it employs faculty qualified to teach graduate courses.

- 2. Additional costs to students:** No.

Include those for supplemental packets, hardware/software, or any other additional instructional, technical, or technological requirements. (Course fees must be approved by the President’s Council.)

- 3. Text and supplementary materials to be used (Include publication dates):**

Chaisson and McMillan, “Astronomy Today 7th Edition”, Prentice Hall, 2010

PART VI: COMMUNITY COLLEGE TRANSFER

If the proposed course is a 1000- or 2000-level course, state either, "A community college course may be judged equivalent to this course" OR "A community college course will not be judged equivalent to this course." A community college course will not be judged equivalent to a 3000- or 4000-level course but may be accepted as a substitute; however, upper-division credit will not be awarded.

A community college course may be accepted as a substitute to this course; however, upper-division credit will not be awarded.

PART VII: APPROVALS

Date approved by the department or school: 04/11/2011

Date approved by the college curriculum committee: 04/15/2011

Date approved by CAA: 05/05/2011

*In **writing-active courses**, frequent, brief writing activities and assignments are required. Such activities -- some of which are to be graded -- might include five-minute in-class writing assignments, journal keeping, lab reports, essay examinations, short papers, longer papers, or a variety of other writing-to-learn activities of the instructor's invention. Writing assignments and activities in writing-active courses are designed primarily to assist students in mastering course content, secondarily to strengthen students' writing skills. In **writing-intensive courses**, several writing assignments and writing activities are required. These assignments and activities, which are to be spread over the course of the semester, serve the dual purpose of strengthening writing skills and deepening understanding of course content. At least one writing assignment is to be revised by the student after it has been read and commented on by the instructor. In writing-intensive courses, students' writing should constitute no less than 35% of the final course grade. In **writing-centered courses** (English 1001G, English 1002G, and their honors equivalents), students learn the principles and the process of writing in all of its stages, from inception to completion. The quality of students' writing is the principal determinant of the course grade. The minimum writing requirement is 20 pages (5,000 words)

Student
Success
Center

<http://www.eiu.edu/~success/>

581-6696



<http://www.eiu.edu/~counsctr/>

581-3413

Career
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Disability
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