

Eastern Illinois University
Revised Course Proposal
PHY 1053G, Adventures in Physics Lab

Please check one: New course Revised course

PART I: CATALOG DESCRIPTION

1. **Course prefix and number, such as ART 1000:** PHY 1053G
2. **Title (may not exceed 30 characters, including spaces):** Adventures in Physics Lab
3. **Long title, if any (may not exceed 100 characters, including spaces):** Adventures in Physics Lab
4. **Class hours per week, lab hours per week, and credit [e.g., (3-0-3)]:** 0-2-1
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):** Experimental work demonstrating physical principles and their applications. PHY 1052G must be taken concurrently.
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.
None
 - 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):
PHY 1052G
 - 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:
Online sections are available to off-campus students only.
 - 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 – Lab; Writing active- this course satisfies the criteria for a writing-active course through the laboratory reports, which have several distinct parts (purpose, theory, procedure, data, and conclusions) and are several pages in length.
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: PHY 1053G labs will provide students with practical experimental and problem solving skills.

In successfully completing this course, students will:

1. Collect data by making the appropriate measurements and subsequently analyze the data to determine the relationship between the various physical variables. (critical thinking)
2. Develop lab reports for each exercise (writing, critical thinking)
3. Demonstrate use of scientific terminology, which will make them a more informed electorate. (citizenship)
4. Demonstrate ability to apply problem solving techniques in the area of physics. (critical thinking)

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. 2**
- **EIU graduates will think critically. 1,2,4.**
- **EIU graduates will function as responsible citizens. 3.**

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:

- **Depth of content knowledge**
- **Effective critical thinking and problem solving**
- **Effective oral and written communication**
- **Advanced scholarship through research or creative activity**

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

Learning Objectives	Pre-lab quizzes	Lab reports	Video-conference (Tech. delivered section)
Collect data by making the appropriate measurements and subsequently analyze the data to determine the relationship between the various physical variables.		X	X
Develop lab reports for each exercise.		X	
Demonstrate use of scientific terminology, which will make them a more informed electorate.	X	X	X

Demonstrate ability to apply problem solving techniques in the area of physics.	X	X	X
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3. Explain how the instructor will determine students' grades for the course:

On-campus course

Pre-lab quizzes 20%

Lab reports 80 %

Technology delivery course

Pre-lab quizzes 20%

Lab reports 70 %

Video conference 10%

The following grading scale will apply: 86-100% = A; 70-85% = B; 60-69% = C; 50-59% = D; 49% or less = F.

4. 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 lab kits will be dispatched to each student in timely manner. Written lab reports will be submitted on weekly basis using WebCT provided assessment tools. A part of lab report will be video recording of experiments done by students. Pre-lab activities will be provided through quizzes, and additional web links.
- b. Describe how the integrity of student work will be assured:** Quizzes will be posted at certain time intervals and have to be submitted no later than 45 minutes since beginning. Oral and video communication with students will assure that students master required experimental techniques. Students will be asked to use a web camera and record specific part of experiments. They will submit these recordings as a part of lab reports.
- 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.):**
 Instructor-student communication has been based on e-mail, telephone, and Skype or Elluminate. On campus (or close to campus) students have been more than welcome to visit the instructor in his office.

5. For courses numbered 4750-4999, specify additional or more stringent requirements for students enrolling for graduate credit. N/A

6. 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 *.)

Writing active- this course satisfies the criteria for a writing-active course through the laboratory reports,

which have several distinct parts (purpose, theory, procedure, data, and conclusions) and are several pages in length.

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. The experimental activities that are presented to the students will take approximately 2 hours each and will be equivalent in the technology delivery and the on-campus version of the labs.

1. Experimental Errors and Uncertainty
2. Acceleration
3. Free fall
4. Conservation of Momentum
5. Friction
6. Centripetal Acceleration
7. Pendulum and the Calculation of "g"
8. Specific Heat Capacity of Metals
9. Determining the Speed of Sound
10. Electric Fields
11. Mapping a magnetic Field
12. Resistors in Series and Parallel Circuits
13. Optical bench with Mirrors and Lenses
14. Diffraction Grating
15. Polarized Light

The technology delivered version of the course covers the same lab topics as the in class version. In addition, the on line version may provide a number of supplementary web based simulations and "virtual" lab activities.

PART IV: PURPOSE AND NEED

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

- 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 Sciences – Lab This course will promote an understanding of the nature and methods of science, its reliability and its limitations. The hands on approach will help to demystify the science and technology. Through the activities of the lab the students will be learning how to confront problems and issues related to scientific method.
- 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. We are demonstrating the efficacy of running a technology delivered laboratory experience for our students.

2. **Justify the level of the course and any course prerequisites, co-requisites, or registration restrictions.** PHY 1052G must be taken concurrently. Online sections are available to off-campus students only because that is the target audience for the course.
3. **If the course is similar to an existing course or courses, justify its development and offering.**
 - 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.** This course is the same catalog number as an on campus course that already has been taught for many years. We are making it a technology delivered course also.
 - 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.**
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.** This course is 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:**

Any Physics faculty member may be assigned to teach on campus version of this course. Technology delivered section of the course can be taught by any OCDI approved faculty in physics.

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:** Students in technology delivered section of the course will need to buy Lab kits (Cost will be ~ \$120 per student, paid directly to the Lab kit supplier), subject to approval by the President's Council.

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):**

PHY 1053 G Lab manual, EIU Physics Department, 2011
PAUL G. HEWITT "CONCEPTUAL PHYSICS", 10TH EDITION, Pearson 2009.

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 judged equivalent to this course.

PART VII: APPROVALS

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

Date approved by the college curriculum committee: 4/15/2011

Date approved by the Honors Council (*if this is an honors course*):

Date approved by CAA: 4/28/2011

*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).

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