Agenda Item #06-119
Effective Spring 2008

Eastern Illinois University
New Course Proposal
PHY 3002, Introduction to Health Physics

Please check one: ☒ New course ☐ Revised course

PART I: CATALOG DESCRIPTION

1. **Course prefix and number:** PHY 3002
2. **Title :** Introduction to Health Physics
3. **Long title:**
4. **Class hours per week, lab hours per week, and credit:** (3-0-3)
5. **Term(s) to be offered:** ☐ Fall ☒ Spring ☐ Summer ☐ On demand
6. **Initial term of offering:** ☐ Fall ☒ Spring ☐ Summer ☐ Year 2008
7. **Course description:** Nuclear physics and radioactivity, radiological measurements, interactions of radiation with matter, radiation exposure and biological damage, safe radiological procedures and practices.
8. **Registration restrictions:**
   a. **Identify any equivalent courses**.
   b. **Prerequisite(s):** PHY 1372 (or PHY 1162 with permission of Chair); and MAT 1441G (or MAT 2110G)
   c. **Who can waive the prerequisite(s)?**
      ☐ No one ☒ Chair ☐ Instructor ☐ Advisor ☐ Other (Please specify)
   d. **Co-requisites**:
   e. **Repeat status:** ☒ Course may not be repeated.
   f. **Degree, college, major(s), level, or class** to which registration in the course is restricted, if any:
   g. **Degree, college, major(s), level, or class** to be excluded from the course, if any:
9. **Special course attributes:**
10. **Grading methods**: ☒ Standard letter ☐ C/NC ☐ Audit ☐ ABC/NC
11. **Instructional delivery method:** lecture

PART II: ASSURANCE OF STUDENT LEARNING

1. List the student learning objectives of this course:

- Analyze the results of measurements related to radiation safety.
- Design effective radiation safety measures.
- Identify the appropriate instruments to use for radiation measurements.
- Calculate dosages from knowledge of radioactive source information.
- Calculate source activities from isotope type, quantity, and assay dates.
- Research, understand, and apply radiation related statutes and regulations.

a. This is not a general education course.
b. This is not a graduate course.

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

	Homework (20 %)	Exams (60%)	Final (20%)
Analyze the results of measurements related to radiation safety.	X	X	X
Design effective radiation safety measures.	X	X	X
Identify the appropriate instruments to use for radiation measurements.	X	X	X
Calculate dosages from knowledge of radioactive source information.	X	X	X
Calculate source activities from isotope type, quantity, and assay dates.	X	X	X
Research, understand, and apply radiation related statutes and regulations.	X	X	X

3. Explain how the instructor will determine students' grades for the course:

- Homework (20%)
- Exams (60%)
- Final Exam (20%)

4. *There are no entirely technology-delivered sections of this course.*
5. *The course number for this course is not between 4750 and 4999.*
6. *There is no writing designation for this course.*

PART III: OUTLINE OF THE COURSE

Units of time: 45 fifty minute lecture periods.

TOPICS	PERIODS
Review and supplement of applicable introductory physics	3
Atomic and nuclear structure	3
Types of radioactivity, radiation kinetics, activity measures	4
Interaction of radiation with matter	4
Dosimetry	3
Instrumentation, measurement procedures, and statistics	5
Harmful effects of radiation on biological systems	3
Radiation safety guidelines and regulations	5
External and internal radiation protection	3
Personal and environmental monitoring	3
Criticality and nuclear fission	3
Non-ionizing radiation	3
Periods reserved for exams	3

PART IV: PURPOSE AND NEED

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

   - This course is a central component of the Radiation Physics option of the Physics Major. It has been taught on a trial basis as a two semester hour (2-0-2) course under the PHY 3011 – Special Topics in Physics. This option in the Physics Major has become popular with students so that the course should have its own course number. The course is being increased to a three semester hour course because the two semester hour course was insufficient to accomplish the objectives of the course at the appropriate breadth and depth of topic coverage.

     a. This is not a general education course.
     b. This is not a technology delivered course.

2. Justify the level of the course and any course prerequisites, co-requisites, or registration restrictions.

   - Students need to have completed an introductory physics sequence and have the ability to apply calculus to the problems encountered in an introductory health physics course.

3. If the course is similar to an existing course or courses, justify its development and offering.

   a. This course is not similar to any existing courses.
   b. No courses will be deleted if this course is approved. The course is required in the Radiation Physics Option.

4. Impact on Program(s):
   This course will be required for the B. S. in Physics, Radiation Physics Option. It increases the number of semester hours by one from the existing requirement of two semester hours of PHY 3011. This course will also be an elective in the Physics Minor.

PART V: IMPLEMENTATION

1. Faculty member(s) to whom the course may be assigned:
   - Dr. Douglas Brandt and Dr. Steven W. Daniels or any qualified faculty member.
2. Additional costs to students: None
3. Text and supplementary materials to be used (Include publication dates):
   - Herman Cember, *An Introduction to Health Physics*, 3rd Ed. 1996, McGraw Hill
   - Standards for protection Against Radiation (32Ill. Adm. Code 340) 2005, State of Illinois

PART VI: COMMUNITY COLLEGE TRANSFER

A community college course may not be accepted as a substitute for this course.

PART VII: APPROVALS

Date approved by the Physics Department October 12th, 2006

Date approved by the College of Sciences Curriculum Committee November 17th, 2006

Date approved by CAA December 7th, 2006