

Course Change Request

Indiana University

South Bend

Campus

Check Appropriate Boxes:

Undergraduate credit

Graduate credit

Professional credit

- 1. School/Division CLAS
- 2. Academic Subject Code: PHYS 3. Current Course Number: P309 4. Current Credit Hours: 2.0
- 5. Current Title: Modern Physics Laboratory
- 6. Effective Semester/Year for changes listed below: Fall 2004 7. Instructor: J. Hinnefeld

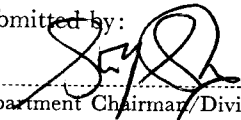
Type of Change Requested (Check appropriate boxes and indicate changes)

- 8. Change course number to: (must be cleared with University Registrar)
- 9. Current course title:
Change to:
Recommended abbreviation (optional)
(Limited to 32 Characters including spaces)
- 10. Current credit hours fixed at: 2.0 or variable from: to
Change to credit hours fixed at: or variable from: 2.0 to 3.0
- 11. Current lecture contact hours fixed at: or variable from: to
Change to lecture contact hours fixed at: or variable from: to
- 12. Current non-lecture contact hours fixed at: or variable from: to
Change to non-lecture contact hours fixed at: or variable from: to
- 13. Is this course currently graded with S-F (only) grades? Yes No
Change to S-F (only) grading? Yes No
- 14. Does this course presently have variable title approval? Yes No
Is variable title approval being requested? Yes No
- 15. Is this course being discontinued? For all campuses or for this campus only
- 16. Current course description

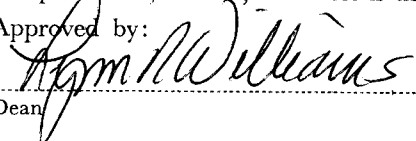
Change course description to (not to exceed 50 words)

- 17. Justification for change to boost instruction in modern physics and laboratory techniques
(Use additional paper if necessary)
- 18. Are the necessary reading materials currently available in the appropriate library? yes
- 19. A copy of every course change proposal must be submitted to departments, schools, or divisions in which there may be overlap of this course with existing courses or areas of strong concern, with instructions that they send comments directly to the originating Curriculum Committee. Please append a list of departments, schools, or divisions thus consulted.

Submitted by:

 Date 28/1/03
 Department Chairman/Division Director
 Date
 Dean of Graduate School (when required)

Approved by:

 Date 2/11/03
 Dean
 Date
 Chancellor/Vice-President

University Registrar

Date

After School/Division approval, forward the last copy (without attachments) to the University Registrar for initial processing, and the remaining four copies and attachments to the Campus Chancellor or Vice-President.

Sample Syllabus

PHYS P309 – Modern Physics Laboratory Indiana University South Bend

Instructor: Jerry Hinnefeld, Assoc. Prof. of Physics, NS355, 237-4467, jhinnefe@iusb.edu

Prerequisites: MATH M216, PHYS P222

Primary Text: No required text. Descriptions of each lab exercise will be produced in-house and distributed to students in the class.

Supplementary Texts: Taylor, *An Introduction to Error Analysis: The Study of Uncertainties in Physical Measurements*, 2nd ed., University Science Books, 1997; Selected readings from *Physics Today*, *American Journal of Physics*, etc.

Objective: This course will give students an opportunity for laboratory work with more sophisticated equipment, and more challenging measurement goals, than in the introductory courses. In addition to the more sophisticated equipment, what sets this course apart from introductory laboratory courses is the level of rigor required in the analysis of data and the level of student initiative expected. Topics such as error analysis and parameter estimation by curve fitting, in particular, will be emphasized. Exercises will include some recreations of historically significant experiments, as well as several measurements dealing with the interaction of various forms of radiation with matter.

Course Meetings: One 4-hour session will be scheduled per week. Some exercises may require additional self-scheduled time on other days. The lab is equipped with a keypad lock, and students will be expected to work independently on those exercises which do not require direct supervision. Ten exercises will be assigned over the course of the semester, some of which will require more than one week for completion.

Lab Reports: Written reports will be required for each lab exercise. Most of these reports will be rather informal, but three will be more formal, similar in structure to a paper submitted for publication.

Grading: The course grade will be based on performance in the laboratory and on the quality of the written reports.

Lab reports	-- 80%
Lab performance	-- 20%

Tentative list of experiments:

- Data Analysis Basics: Error Propagation and Curve Fitting
- Charge-to-Mass Ratio of the Electron (e/m)
- The Franck-Hertz Experiment
- Measurement of the Speed of Light in Air
- Rutherford Scattering of α -particle
- Bragg Scattering of X-rays
- β -particle Spectrometry
- X-ray Fluorescence
- Gamma-Ray Spectroscopy with NaI Detectors
- Half-life of ^{137m}Ba
- α -particle Spectroscopy With a Si Surface-Barrier Detector