

SYLLABUS

Methods of Teaching Physics Labs, PH 597 (Fall 2006), is a one-credit graduate course which is designed to foster successful lab teaching methods for WPI's introductory physics courses.

This course will give graduate students an opportunity to discuss concepts vital to teaching, especially introductory physics labs. Some topics of discussion will include: syllabus design and lesson plan modules; formative and summative assessment; communication and organization; misconceptions research; innovative pedagogies; academic integrity; time management; and, reflective grading practices.

The goals of this course are aimed at the practice of teaching introductory physics labs. The actual procedures of the labs themselves, in addition to lab equipment operations and the corresponding physics theory, are the Teaching Assistant's responsibility. Questions regarding lab procedures and/or the equipment operations should be directed to the lab coordinator, Prof. Hutson (flh@wpi.edu), or if need be, the chief lab design engineer, Professor Jasperson (snj@wpi.edu).

Students registered for this course will be graded as follows.

- I. Attendance and In-Class Activities*(30 %)
- II. Lab Assessment Sheets** (40 %)
- III. Lab Evaluations*** (30 %)

*Please note that because part of your grade will consist of in-class activities, attendance is mandatory and NO make-ups will be allowed. In the event of an extenuating circumstance, documentation must be provided and communication must be made clear.

Lab Assessment Sheets will be distributed in each class and the due date for each is provided in the schedule. In order to complete these sheets, you must first do the actual lab *BEFORE*** you teach it to your students. You will then complete a series of questions which will provide you with an opportunity to assess the educational effectiveness of these labs. Please note that failure to submit these sheets by the due date will result in failure to receive credit for that assignment (**i.e. NO late submissions allowed**).

***Lab Evaluations will be distributed twice throughout the semester. The first set will be offered at the end of A Term, and the final set will be offered at the end of B Term. These evaluations will give the students in your lab sections a chance to evaluate your teaching as a laboratory instructor. For your reference, a copy of the WPI Physics

Laboratory Teaching Assistant Evaluation is included at the end of this syllabus. Please note that your grade (for component III of the course) will consist of the average ranking of section II in the lab evaluation form. These forms will be distributed in our class and further instructions will be provided later in the term.

Additional discussion topics will arise from information you provide in the Lab Assessment Sheets. This may include discussions of common misconceptions students have concerning introductory physics or concerning operation of the lab equipment. In light of this, we will have a somewhat flexible schedule of discussion topics for each class (this is why we do not have a formal schedule of topics). It is therefore imperative that you answer the questions provided in the Lab Assessment Sheets in an honest, thorough, and articulate manner.

Office hours for PH 597 will take place on Mondays, from 2-4 PM, and appointments are welcome. Please feel free to discuss any aspect of the course and/or the labs you are teaching. I will make every effort to help you and I hope that you find this course both effective and influential in your development as physics educators. A Chinese proverb posits: "I hear and I forget. I see and I remember. I do and I understand." It is this very proverb which inspired a recent WPI Alum to conduct a MQP on redesigning the introductory physics labs!

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WPI PHYSICS
LABORATORY TEACHING ASSISTANT EVALUATION

Please answer the following questions regarding your introductory physics lab experience. These reports will be used by the lab TA for self-improvement, and by members of the WPI Physics faculty for TA training. Your responses are anonymous and optional, and your comments will not be returned to your instructor until after the grading deadline. Thank you in advance for your time, concern, and honest feedback.

I: Please provide the following background information:

- A. Name of Laboratory Teaching Assistant: _____
- B. Course and Lab Section (i.e. PH 1110/111, 1120/1121): _____
- C. Class Year: _____
- D. Intended Major(s): _____

II: Comments regarding your Laboratory Teaching Assistant (TA)

For sections II and III, please answer the following questions on a scale of 1 to 5, with: 5 = Excellent; 4 = Good; 3 = Moderate/Average; 2 = Below Average; and, 1 = Poor. Please circle your choices.

- A. My overall rating of my laboratory TA is: 1 2 3 4 5
- B. The lab TA's organization of the course was: 1 2 3 4 5
- C. The lab TA's clarity in communicating lab objectives was: 1 2 3 4 5
- D. The lab TA's skill in providing understandable explanations was: 1 2 3 4 5
- E. The lab TA's skill in speaking clearly and audibly was: 1 2 3 4 5
- F. The lab TA's personal interest in helping students learn was: 1 2 3 4 5
- G. The lab TA's ability to demonstrate proper use of lab equipment was: 1 2 3 4 5
- H. The lab TA's feedback on lab reports was: 1 2 3 4 5
- I. The lab TA's fairness in grading of lab reports was: 1 2 3 4 5
- J. The lab TA's ability to help students, in the laboratory: 1 2 3 4 5
- K. The lab TA's ability to help students, during office hours: 1 2 3 4 5

III: Comments regarding the Lab Assignments and Equipment

- A. The condition of the lab and/or computer equipment was: 1 2 3 4 5
- B. The intellectual challenge presented by the lab assignments was: 1 2 3 4 5
- C. The clarity and specificity of lab assignment objectives was: 1 2 3 4 5
- D. The ability to learn from these labs was: 1 2 3 4 5
- E. My overall rating of the educational quality of these labs is: 1 2 3 4 5

IV: FREE RESPONSE: What did you particularly *like and dislike* about these labs? Can you suggest anything that the Lab TA could do to improve the quality of teaching?