

## Essay Guidelines for PHYSICS 429.03

During the first year of the *Chicago ITQ Project*, it became evident that Modeling teachers needed to know more about certain topics not directly addressed during the summer workshop. As a result, instructional units have been prepared to deal with five specific topics that will be address in this year's workshop:

- Identifying, Confronting, and Resolving Student Preconceptions
- Implementing Socratic Questioning
- Teaching the Nature of Science
- The Role of Climate Setting
- Student Metacognition and Self Regulation

As a PHYSICS 429.03 course requirement, you must write an essay about each of these topics using information and resources provided during the summer workshop, and incorporating your own research and experiences. Answers to specific questions should address how you will respond to various situations in your own classroom. There is not necessarily a right or wrong response to any particular question, but you should clearly and concisely explain and justify your intentions or proposed actions.

**General Guidelines:** Students must write five 2- to 3-page (1-inch borders all around, double spaced, 12 point Times font, page count does not include cover page) essays. Essays may be longer if necessary to respond fully and meaningfully to each question. Essays should carry the student's name as well as the appropriate title. Essays should be e-mailed as MSWord, RTF, or PDF documents to the course instructor at [wenning@phy.ilstu.edu](mailto:wenning@phy.ilstu.edu).

**Specific Guidelines:** Please respond with your own thoughts, in your own words, and provide justifications for each of the following questions by essay topic. Please include the question and question number in your essay. Papers may be completed and submitted in any order. Essays will be scored with the use of a scoring rubric. Examine the PTE essay scoring rubric before you begin your work: [http://www.phy.ilstu.edu/pte/Essay\\_Scoring\\_Rubric.pdf](http://www.phy.ilstu.edu/pte/Essay_Scoring_Rubric.pdf)

**Assessment-as-Learning Policy:** Assessments of student performance will be used not only to assign scores, but to improve student performance. Each submitted essay will be assessed with the use of a scoring rubric. Unsatisfactory work will be returned to the student for improvement if requested and submitted before the deadline. A student's score can be improved by appropriate revision and resubmission, so long as all deadlines are met. See the course syllabus for deadlines.

### Essay Topics

- Identifying, Confronting, and Resolving Student Preconceptions
  1. How can and do student preconceptions negatively affect student learning? Explain and give an example
  2. Using an example, explain how you can identify, confront, and resolve a typical preconception commonly encountered in the area of mechanics.

- Implementing Socratic Questioning
  1. What is the nature of Socratic Questioning, and how does it differ from other types of questioning?
  2. What is the role of Socratic Questioning in the Modeling Method?
  
- Teaching the Nature of Science
  1. Explain the importance of the nature of science in student achievement of general scientific literacy.
  2. Explain how a teacher can both directly and indirectly teach the subject matter of the nature of science.
  
- The Role of Climate Setting
  1. Explain the role and importance of climate setting in the classroom when teaching by telling is replaced by student inquiry.
  2. Explain how, when, and with whom climate setting should be conducted when teaching by telling is replaced by student inquiry.
  
- Student Metacognition and Self-Regulation
  1. Explain what is meant by both student metacognition and self-regulation.
  2. Describe at least three approaches that can be used to get students to distinguish what they know from what they don't know, and how to best help them to make this assessment and repair any deficit in knowledge and/or understanding so determined.