

Teaching Internship Seminar (Physical Science Section)
15:255:536:04
3 Credits

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| Instructor: Eugenia Etkina | Eugenia.etkia@gse.rutgers.edu |
| Phone Number 732 932 7496 ext 8339 | 10 Seminar Pl Rm 217 |
| Office Hours: by appointment | Prerequisites or other limitations: A student should be in an EdM+Cert degree program in physics/physical science |
| Mode of Instruction: <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Seminar <input type="checkbox"/> Hybrid <input type="checkbox"/> Online <input type="checkbox"/> Other | Permission required: <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Directions about where to get permission numbers: from the instructor |

Learning goals

The goals of the course are to learn how to plan, implement and reflect on classroom instruction in physics/physical science that engages all students in productive and meaningful learning of physics content and practice. Achievement of those goals includes mastering time management, emotional control, physics experimental skills, and, most importantly, communication skills (communication with students, cooperating teacher, parents and school administration). Additional goals include continued improvement of one's own physics understanding and acquisition of additional strategies that engage diverse learners in mastering physics.

Course catalogue description

The goal of the course is to support student teaching of pre-service physical science teachers. The course will focus on listening to the students, preparation of unit plans, lesson plans, development of assessment instruments and learning to use them, experimental design, and reflection on teaching.

Class materials:

A. Van Heuvelen, and E. Etkina "The Physics Active Learning Guide", San Francisco: Addison Wesley, 2006.

R. Knight. "Five Easy Lessons", San Francisco: Addison Wesley, 2003.

A high school text that you are using in your school. PUM modules, diagnoser.com

Grading and Activities Your course final grade will be based on attendance, participation in the discussions, reflection on teaching, lesson plans, quizzes and exams that you will design, and teaching portfolio. Each assignment can be improved, as many corrections as needed are encouraged.

| Activity | Total points |
|---------------------------|---------------------|
| Attendance, participation | 100 |
| Reflection on teaching | 100 |
| Unit and lesson plan | 100 |
| Toy story | 100 |
| Debate | 100 |
| Assessment instruments | 100 |

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| Teaching portfolio | 100 |
| Grand Total | 700 |

Description of activities

Attendance, participation in class discussions: Each week students will meet and discuss their experiences during student teaching, design lesson plans, assessment activities, and will learn how to use equipment. Attendance and participation in these meetings will be a basis for your course grade. In addition in every class we will spend 1 hour working on the learning and teaching of the content that we did not touch in our previous classes.

Reflection on teaching: You will keep a reflective journal during your teaching. The journal with reflections should be e-mailed to Eugenia every Sunday night. It should consist of two parts: pre-post teaching reflection on of one lesson per day and the RTOP for that lesson. Make sure that you write reflections EVERY day, do not save them for Saturday. The most difficult thing is to record what student understanding looked like, so do not wait till you forget it!
 Components of the reflection: Before teaching 1. What do I plan to accomplish? 2. How will I know that students are learning? 3. What are the strengths of the students that I plan to build on? 4. What are potential weaknesses? After Teaching: 1. What did I accomplish? 2. What did student understanding look like? 3. What were their strengths? 4. What were their weaknesses? 5. What would I change in the lesson now?

Unit and Lesson plan: At the beginning of the semester you will design a unit plan for a unit that you will teach later, with a detailed lesson plan of one of the lessons. After you teach the unit you will write a detailed reflection on it, including the reflection on one lesson whose lesson plan you submit. We will discuss the unit and lessons in class, and later discuss the results of formative and summative assessment. Student work without names should be provided for one formative assessment of that unit and the final summative assessment. You will bring student work to class with the examples of your feedback. Deadline for a complete unit and lesson - November 1st. The unit and lesson plan will be uploaded on the Sakai website (the structures of both are attached).

Toy Story: As a teacher you will need to have a library of cool activities that you can pull out of your hat any time life gets difficult. In addition, you want your students to experience the joy of teaching. To achieve these goals we as a class will prepare a “Toy Story” – an interactive 1-hour show about the physics of different toys. You will all travel among cooperating schools with the show so all students in the cooperating schools can enjoy it. The toy themes you can choose from: mechanical toys, elect toys, radio toys, music toys, etc. You will need to collect 5-6 toys and prepare a fun 10-min interactive piece so participating students can learn physics and connect it to real world. The show will start traveling in November.

Debate In mid October we will have a debate in class - should we or should we not use nuclear energy. Your task is to prepare the arguments on both sides and be ready to join one side or the other during the debate. The students from the new cohort will be the audience. Debate date is November 4th.

Assessment instruments: You will use two of your assessment activities included in the unit (one summative and one formative) during class discussions. You will need to make copies of your student work with no names and use the copies for analysis in class. The activities themselves should be e-mailed to the members of the class in advance.

Teaching portfolio: At the end of the course you will upload all of the documents that are required for your teaching portfolio. These include the teaching philosophy statement, unit and lesson plan, parent-teacher conference document, and classroom management plan.

Academic integrity: Make sure that you provide proper citations for all materials that you use in your lesson and unit plans.

Discussion web board: Materials for class will be posted on the google discussion board; after you get the e-mail about the posting; you are responsible for printing them and bringing a copy to class.

Course Schedule

Topics for Discussions (by week)

PTS - Professional Teaching Standards; NSCS - National Science Content Standards, NJCCCS - New Jersey Core Curriculum Content Standards

| Week | Topic | Assignm ent (Ch) | PTS | NSCS | NJCCCS |
|------|--|------------------------------|--|----------|---|
| 1 | Different types of lessons. Planning of kinematics unit. | Ch. 1, 2, | PTS Standard II: i (2). PTS Standard II: ii (1). | A, B, E | 5.1 (A,B); 5.7 (A) |
| 2. | Games in a physics class. Planning of momentum unit. | Ch. 5 | PTS Standard II: i (2). PTS Standard II: ii (1). | A, B, G | 5.1 (A,B); 5,7 (A); 5.4 (C) |
| 3. | Writing a test. Planning of momentum unit. | Ch. 5 | PTS Standard V: iii (3). | A, B, G | 5.6 (A); 5. (B); 5,3 (All), 5.10 (A, B) |
| 4. | Reading and understanding student work. Planning of the momentum unit. | Ch 5 | PTS Standard V: iii (3). | A, B, E | 5.1 (C); 5.3 (All); 5.6 (A); 5.7 (B) |
| 5. | Listening to students. Planning a geometrical optics unit. | Ch 20, 21 | PTS Standard II: ii (4). | B, F, G. | 5.3 (C); 5.6 (B), 5.7 (B) |
| 6. | Pre/post/gain. Conceptual tests - Force concept Inventory and Conceptual Survey of Electricity and Magnetism. Planning a geometrical optics unit. James Finley visit. | Ch. 1-4; 14-18; 20. 21 | PTS Standard II: ii (4) | B | 5.7 (A, B) |
| 7. | Visit to the MSLC. Using RTOP to assess your teaching. Planning a geometrical optics unit. | Ch. 20, 21 | PTS Standard V: iii (4). | | 5.1 (C) |
| 8. | Formative assessment - theory and reality. Chris D'Amato | Ch. 20- 21 | | B | |

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| | visit. Planning a geometrical optics unit. | | | | |
| 9. | Interpreting student work. Writing in a physics class. Planning a wave optics unit. Debate. | Ch. 22 | PTS Standard V: iii (3). | B | 5.7 (A) |
| 10. | Students of diverse needs - changing a lesson plan in optics. Keith Thomas visit. | Ch. 20-22 | PTS Standard II: ii (1), VII: iii (5) | | |
| 11-13. | Reflection on teaching. Planning a quantum optics unit. | Ch. 23 | PTS Standard III: iii (2,3), IV: I (3), ii (2), VI: iii (3,4,5), VIII: iii (5) | | |
| 14. | Writing a teaching philosophy statement. Planning a quantum optics unit. | Ch. 23 | | A, B, E, F, G | 5.1 (A,B); 5.2 (A,B); 5.4 (All); 5.6 (A, B) |
| 15 | Reflection on learning. | | | | |