Faculty Committee on Graduate and Continuing Education

Proposal to Change a Graduate Course

Department: Physics and Astronomy
Graduate Program: Science and Mathematics for Teachers
Course number and title: SMFT 555, APPLICATION OF PHYSICS FOR TEACHERS, HOW THINGS WORK

Will this course be cross-listed with an undergraduate or other graduate course? ☐ YES ☐ NO
If yes, please complete an attach to this proposal a Permission to Cross-List a Graduate Course form.

Course change(s) will go into effect: Fall 2009
Change(s) desired: Change from 4 credit hours to 3 credit hours and from 6 contact hours to 3 contact hours.

Justification for change(s): The change should be made due to staffing constraints and due to low enrollment in the recent years.

Signature of Program Director: [Signature]
Date: [Date]

Date approved by the Department: [February 10, 2009]

Signature of Department Chair: [Signature]
Date: [February 11, 2009]

Signature of Schools' Dean: [Signature]

Return form to the Graduate School Office for Further Processing

Signature of Chair of the Faculty Committee on Graduate and Continuing Education

Date: 6-15-2009

Signature of Chair of Grad Council: [Signature]
Date: 9-17-2009

Signature of the Faculty Secretary: [Signature]

If more space is needed for any section, please attach additional sheets to this form.

November 2007
APPLICATION OF PHYSICS FOR TEACHERS- HOW THINGS WORK
Course Syllabus

I CONTACT INFORMATION

<table>
<thead>
<tr>
<th>Instructor</th>
<th>Dr. Ana Oprisan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Office</td>
<td>Room 319, Bell South building</td>
</tr>
<tr>
<td>Phone</td>
<td>(843) 953-7582</td>
</tr>
<tr>
<td>Email</td>
<td><a href="mailto:oprisana@cofc.edu">oprisana@cofc.edu</a></td>
</tr>
<tr>
<td>WWW</td>
<td><a href="http://www.cofc.edu/~oprisana/">http://www.cofc.edu/~oprisana/</a></td>
</tr>
<tr>
<td>Lecture and lab</td>
<td>Thursdays, SC room 106, 7:00 P.M. - 10 P.M.</td>
</tr>
<tr>
<td>Office Hours</td>
<td>Thursdays, Bell South building, room 319, 4:00 P.M. - 6:40 P.M. or by appointment</td>
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II COURSE PHILOSOPHY

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We will be studying several units in physical science. Because this is a single semester course, we will not be able to study all the subjects in physics. However, we hope to be able to study several of them in depth including Electricity, Magnetism, Heat, Energy, and Optics. This will be a hands-on, inquiry based course. We will attempt to learn as much as possible by doing. The laboratory portion of the class will be done in cooperative groups of 2-3 students.

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1. To understand the historical and sociological contexts that lead to major advances in physics.
2. To develop a strong understanding of the principles that forms the foundation of Physics. The emphasis will be placed on conceptual understanding rather than on memorization of definitions, formulas, etc.
3. To develop and expand physical curiosity.
4. To enhance problem-solving skills and investigation of physical phenomena.
5. To broaden an appreciation for logical qualitative and quantitative reasoning.
6. To provide opportunities for students to generalize their knowledge.
7. To enhance scientific communication skills.
8. To participate in a variety of teaching styles.

II.2 Objectives

After the successful completion of this class, the students will be able to:
1. Design experiments which examine the laws of physics.
2. Describe problems and their solutions to a variety of audiences.
3. Provide different representations for a problem (verbal, graphical, and through diagrams or equations).
4. Solve word problems.
5. Apply physical principles to novel situations.
6. Engage students in the study of the relationship of physics to other fields and relating physics to their real-life experiences.
7. Organize and manage physics activities effectively and safely in various settings.
8. Use various types of assessment strategies related to students’ needs and their level of learning and development.

II.3 Textbook and other resources

1. The textbook recommended for this class is the “Conceptual physics” by Paul Hewitt.
2. “Powerful ideas in physics” units will be provided.
3. “How things work” -the text is optional as the chapters chosen for this class are available on the Internet.
4. Substantial handouts of additional materials will be provided in a timely manner.
5. You should have a stand-alone, hand-held scientific calculator able to compute trigonometric and exponential functions.

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No textbooks, notes, or any other kind of help is allowed during tests and the final exam. During the semester you will compile a short formula sheet that can be used during the tests. The final exam is comprehensive and the schedule can be found at http://www.cofc.edu/~register/courseCalendars.htm. There will be no make-ups for the tests or the final exam.

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In case of extenuating circumstances (major religious holidays, illness, or a valid personal emergency) you can request a deadline extension. Any such requests must be made before the due date, or will otherwise not be considered.

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The lab exercise will be a combination of the topics covered in “Conceptual physics”, and handouts of other lab activities using simple hands on activities or computer-based tools. The core material in these experiments will be explored through a series of activities that consists of predictions, observations, measurements, analysis and reflection and are designed to guide students through the process of scientific inquiry and cooperative learning. The laboratory portion of the class will be done in cooperative groups of 2-3 students. Each group will return one report and the laboratory grade is essentially a group work grade.

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It is your responsibility to keep an organized portfolio of materials ideas, laboratories, investigations, handouts and other resources that can be used in your classes or shared with other teachers for use in their classes.

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WebCT is an online management course management system adopted by the College of Charleston. We will use the WebCT website (https://webct.cofc.edu/webct/public/home.pl) to post solutions, grades, assignments, and make announcements. The WebCT page will include a calendar with test dates and other important information. To log into WebCT you need your Cougar rail ID # and your 6-digit Cougar Trail PIN.

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Your final project should be based on any topics covered in class and should address some portion of the South Carolina standards for grades K-8 or high school. Your project should include an experimental investigation using an existing kit in our lab, your school, Charleston Math and Science Hub, Charleston County School System Material resources Center, Berkley/Dorchester Math and Science Hub, Berkley County System, etc. Be prepared to give an oral presentation, and to hand in a summary of your project. Guidelines of the oral presentation, format and elements to be included in your final project will be available via the WebCT website.

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There are many ways to get assistance with the material in this course. Be sure to use these support resources as soon as you feel unsure about anything.

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4. **Phone:** Feel free to contact me via phone with any question. My phone number is (843) 953-7582.

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<td>Unit: Electricity – Electric current</td>
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<td>Unit: Heat and energy</td>
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<td>Unit: Electricity</td>
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<td>Unit: Heat and energy</td>
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<td>Review unit</td>
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5 of 6
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<tr>
<th>Week 7</th>
<th>Week 14</th>
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<tr>
<td>Unit: Electricity Test 1</td>
<td>Final presentations</td>
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6 of 6
APPLICATION OF PHYSICS FOR TEACHERS - HOW THINGS WORKS
Course Syllabus

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Instructor: Dr. Ana Oprisan
Office: Room 319, Bell South building
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Email: oprisana@cofc.edu
WWW: http://www.cofc.edu/~oprisana/
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