# http://www.ric.edu/webcommunications/images/SealWithText_Small_Black.pngUNDERGRADUATE CURRICULUM COMMITTEE (UCC) PROPOSAL FORM

## Cover page roll over blue text to see further important [instructions](#instructions): please read.

**N.B. DO NOT USE HIGHLIGHT, JUST DELETE THE WORDS THAT DO NOT APPLY TO YOUR PROPOSAL**

**ALL numbers in section (A) need to be completed, including the impact ones.**

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| --- | --- | --- | --- | --- | --- |
| A.1. [Course or program](#Proposal) | **physics b.s.** | | | |  |
|  |  | | | |  |
| A.2. [Proposal type](#type) | **Program:** [**revision**](#revision) | | | |  |
| A.3. [Originator](#Originator) | **Andrea Del Vecchio** | [Home department](#home_dept) | **Physical Sciences** | | |
| A.4. [Rationale](#Rationale) | **In the past year as we have reviewed our curriculum for the B.S. degree that began in 2014, we have noticed that students do not necessarily get all the content coverage that they need within the required courses in the physics program. Since many of the second semester courses of the key physics disciplines (mechanics, electricity and magnetism, quantum mechanics and thermodynamics) are electives, students get more than sufficient coverage in the areas that they take electives and less than sufficient coverage in the other areas.**  **In addition, we have found that the Quantum I/ Quantum II sequence as we designed it in our original B.S. proposal does not work well for students. It separates the courses too much and sometimes makes it difficult for students to graduate promptly.**  **Our solution to these problems is to increase the number of credits in our four core physics courses (PHYS 307 Quantum Mechanics I, PHYS 311 Thermodynamics, PHYS 401 Advanced Electricity and Magnetism I and PHYS 403 Classical Mechanics) from 3 to 4 and to move PHYS 407 (Quantum Mechanics II) to the elective category. This will allow us to cover all the necessary basic material for both graduate work and entering the work force within these four required courses. Students can then choose their electives based on their specific areas of interest and see a more advanced treatment of these topics. In addition, this increase from 3 to 4 credits will allow us to include some computational physics material in these courses. Two of our faculty members, Medini Padmanabhan and Ben Young received a grant from the CRCA to include the use of Mathematica in our upper level courses. Dr. Padmanabhan began including this computational material in her PHYS 307 course last semester, but was hampered by the additional class time it required. Computational skills are very important in all scientific fields, so we feel this exposure to computational physics will be very beneficial to our students**  **We feel that this will increase the academic rigor of our program while offering students more flexibility in selecting their courses and additional computational skills. All of these aspects of the revised program will help better prepare our students for whatever their future holds after they leave Rhode Island College.** | | | | |
| A.5. [Date submitted](#date_submitted) | **3/31/17** | A.6. [Semester effective](#Semester_effective) | | Fall, 2017 | |
| A.7. [Resource impact](#Resource) | *[Faculty PT & FT](#faculty" \o "Need to hire new full-time or part-time faculty? This is where you indicate if this proposal will be affecting FLH in your department/program.)*: | **Minimal. There will be an increase of just one load hour per semester for the entire program.** | | | |
|  | [*Library*:](#library) | **None** | | | |
|  | [*Technology*](#technology) | **None. We have all the resources we need for the new computational component of our courses.** | | | |
|  | [*Facilities*](#facilities): | **None.** | | | |
| A.8. [Program impact](#prog_impact) | **This will affect the physics program and the physics secondary education program. However, Dr. Paul Tiskus is also submitting a revised physics secondary education program that eliminates other courses to reduce the impact on total credits. If the changes to this program are approved, the changes to this program will be minimal. The affected courses are not required for any other programs.** | | | | |
| A.9. [Student impact](#student_impact) | **Only students from the physics and physics secondary education programs will be affected. We do not foresee any negative impacts of these changes. In fact, these changes should make it easier for students to graduate in a timely fashion and will give them better preparation for their post-college plans. There will be an increase of just one credit in the degree program, while the number of courses required will decrease by one.** | | | | |
| A.10. The following screen tips are for information on what to do about catalog copy until the new CMS is in place; check the “Forms and Information” page for updates. [Catalog page.](#catalog)  [Where are the catalog pages](#catalog)? [Several related proposals](#catalog)? Do **not** list catalog pages here. **All** catalog copy for a proposal must be contained within a **single** file; put page breaks between sections. Make sure affected program totals are correct if adding/deleting course credits. | | | | | |

### C. [Program Proposals](#program_proposals) **complete only what is relevant to your proposal Delete this whole page if the proposal is not revising, creating, deleting or suspending any progam.**

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| --- | --- | --- |
|  | [Old (for revisions only)](#old_program) | New/revised |
| C.1. [Context](#summary) | **The Physical Sciences Department has offered a degree in physics since 1988. The program is designed to prepare interested students for graduate school in physics or a related discipline or to enter the STEM workforce.** | **Since the changes to the degree program are minor, it serves the same purpose as the current degree program.** |
| C.2. [Enrollments](#enrollments) | **Typically, we have 10–14 physics majors in the department with 1-4 graduating per year.** | **Typically, we have 10–14 physics majors in the department with 1-4 graduating per year.** |
| C.3. [Admission requirements](#admissions) |  |  |
| C.4. [Retention requirements](#retention) |  |  |
| C.5. [Course requirements](#course_reqs) for each program option | **PHYS 200 Mechanics**  **PHYS 201 Electricity and Magnetism**  **PHYS 307 Quantum Mechanics I**  **PHYS 311 Thermodynamics**  **PHYS 312 Mathematical Methods**  **PHYS 313 Junior Lab**  **PHYS 401 Advanced Electricity and Magnetism I**  **PHYS 403 Classical Mechanics**  **PHYS 407 Quantum Mechanics II**  **PHYS 413 Senior Lab**  **One of the following lab elective courses**  **PHYS 315 Optics**  **PHYS 320 Analog Electronics**  **PHYS 321 Digital Electronics**  **Two of the following elective courses**  **PHYS 309 Nanoscience and Nanotechnology**  **PHYS 402 Advanced Electricity and Magnetism II**  **PHYS 409 Solid State Physics**  **PHYS 411 Statistical Mechanics**  **Cognates**  **CHEM 103 General Chemistry I**  **CHEM 104 General Chemistry II**  **MATH 212 Calculus I**  **MATH 213 Calculus II**  **MATH 314 Calculus III**  **MATH 416 Ordinary Differential Equations** | **PHYS 200 Mechanics**  **PHYS 201 Electricity and Magnetism**  **PHYS 307 Quantum Mechanics I**  **PHYS 311 Thermodynamics**  **PHYS 312 Mathematical Methods**  **PHYS 313 Junior Lab**  **PHYS 401 Advanced Electricity and Magnetism I**  **PHYS 403 Classical Mechanics**  **PHYS 413 Senior Lab**  **One of the following lab elective courses**  **PHYS 315 Optics**  **PHYS 320 Analog Electronics**  **PHYS 321 Digital Electronics**  **Two of the following elective courses**  **PHYS 309 Nanoscience and Nanotechnology**  **PHYS 402 Advanced Electricity and Magnetism II**  **PHYS 407 Quantum Mechanics II**  **PHYS 409 Solid State Physics**  **PHYS 411 Statistical Mechanics**  **Cognates**  **CHEM 103 General Chemistry I**  **CHEM 104 General Chemistry II**  **MATH 212 Calculus I**  **MATH 213 Calculus II**  **MATH 314 Calculus III**  **MATH 416 Ordinary Differential Equations** |
| C.6. [Credit count](#credit_count) | **66-67** | **67-68** |
| C.7. Other changes if any |  | **PHYS 307, 311, 401 and 403 will change from 3 to 4 credits** |
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## D. Signatures

##### D.1. Approvals

* Changes that affect General Education in any way MUST be approved by ALL Deans and COGE Chair.
* Changes that directly impact more than one department/program MUST have the signatures of all relevant department chairs, program directors, and relevant dean (e.g. when creating/revising a program using courses from other departments/programs). Check UCC manual 4.2 for further guidelines on whether the signatures need to be approval or acknowledgement.
* Proposals that do not have appropriate approval signatures will not be considered.
* Type in name of person signing and their position/affiliation.
* Send electronic files of this proposal and accompanying catalog copy to [curriculum@ric.edu](mailto:curriculum@ric.edu) and a printed or electronic signature copy of this form to the current Chair of UCC. Check UCC website for due dates.

| Name | Position/affiliation | [Signature](#_Signature" \o "Insert electronic signature, if available, in this column) | Date |
| --- | --- | --- | --- |
| Dr. Peter Meyer | Chair of Physical Sciences |  |  |
| Dr. Earl Simson | Dean of Arts of Sciences |  |  |
| Dr. Donald Halquist | Dean of the Feinstein School of Education and Human Development |  | Tab to add rows |

##### D.2. [Acknowledgements](#acknowledge)

| Name | Position/affiliation | [Signature](#Signature_2) | Date |
| --- | --- | --- | --- |
| Dr. Gerri August | Chair of Educational Studies |  |  |
|  |  |  |  |
|  |  |  | Tab to add rows |