# 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.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| A.1. [Course or program](#Proposal) | **physics 401** | | | |  |
| [Replacing](#Ifapplicable) |  | | | |  |
| A.2. [Proposal type](#type) | **Course: revision** | | | |  |
| A.3. [Originator](#Originator) | **Andrea Del Vecchio** | [Home department](#home_dept) | **Physical Sciences** | | |
| A.4. [Rationale](#Rationale) | **In order to fully prepare students at this level, we fee this course should include Maxwell’s Equations both in vacuum and in materials. This amount of material cannot be covered in three credits. This course will also have computational physics elements introduced into it. A four credit course will allow us to cover the additional material, and the description will be updated to reflect the added materials.** | | | | |
| 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.)*: | **One additional load hour every other year** | | | |
|  | [*Library*:](#library) | **None** | | | |
|  | [*Technology*](#technology) | **None** | | | |
|  | [*Facilities*](#facilities): | **none** | | | |
| A.8. [Program impact](#prog_impact) | **This would affect only the physics and physics secondary education programs.** | | | | |
| A.9. [Student impact](#student_impact) | **This will allow students to have a more through preparation in electricity and magnetism.** | | | | |
| 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. | | | | | |

B. [NEW OR REVISED COURSES](#delete_if) **DELETE THE WORDS THAT DO NOT APPLY TO YOUR PROPOSAL within specific categories, but do not delete any of the categories. DO NOT use highlight. Delete this whole page if this proposal does not include a new or revised course.**

|  | Old ([for revisions only](#Revisions)) | New |
| --- | --- | --- |
| B.1. [Course prefix and number](#cours_title) | **PHYS 401** | **PHYS 401** |
| B.2. Cross listing number if any |  |  |
| B.3. [Course title](#title) | **Advanced Electricity and Magnetism I** | **Advanced Electricity and Magnetism I** |
| B.4. [Course description](#description) | This is an examination of the theory and application of electrostatic fields, charge, potential, magnetic fields, steady currents, magnetic flux, inductance, transient current, radiation, and magnetic energy. Lecture. | This is an examination of the theory and application of electrostatic fields, charge, potential, magnetic fields, steady currents, magnetic flux, inductance, transient current, radiation, magnetic energy and Maxwell’s Equations. Lecture. |
| B.5. [Prerequisite(s)](#prereqs) | **PHYS 201, MATH 314** | **PHYS 201, MATH 314** |
| B.6. [Offered](#Offered) | **Fall**  **Odd years** | **Fall**  **Odd years** |
| B.7. [Contact hours](#contacthours) | **3** | **4** |
| B.8. [Credit hours](#credits) | **3** | **4** |
| B.9. [Justify differences if any](#differences) |  | |
| B.10. [Grading system](#grading) | **Letter grade** | **Letter grade** |
| B.11. [Instructional methods](#instr_methods) | **Lecture** | **Lecture** |
| B.12.[Categories](#required) | **Required for major/minor** | **Required for major/minor** |
| B.13. Is this an Honors course? | **NO** | **NO** |
| B.14. [General Education](#ge)  N.B. Connections must include at least 50% Standard Classroom instruction. | **NO** | **NO**  **:** |
| B.15. [How will student performance be evaluated?](#performance) | **Attendance | Class participation | Exams | Presentations |Class Work | Quizzes | Projects |** | **Attendance | Class participation | Exams | Presentations |Class Work | Quizzes | Projects |** |
| B.16. [Redundancy statement](#competing) |  |  |
| B. 17. Other changes, if any |  | |

| B.18**.** [**Course learning outcomes**](#outcomes) | [**Standard(s)**](#standards) | [**How will they be measured**](#measured)**?** |
| --- | --- | --- |
|  |  |  |

| B.19. [**Topical outline**](#outline) |
| --- |
| 1. Vector Analysis    1. Vector algebra    2. Differential calculus    3. Integral calculus    4. Curvilinear coordinates    5. The Dirac Delta function    6. Vector Fields 2. Electrostatics    1. The electric field    2. Divergence and curl of electrostatic fields    3. Electric potential    4. Work and energy in electrostatics    5. Conductors 3. Special Techniques    1. Laplace’s Equation    2. Method of image charges    3. Separation of variables    4. Multipole expansion 4. Electric Fields in Matter    1. Polarization    2. Field of a polarized object    3. The electric displacement    4. Linear dielectrics 5. Magnetostatics    1. The Lorentz field    2. Biot-Savart Law    3. Divergence and curl of the magnetic field    4. Magnetic vector potential 6. Magnetic fields in matter    1. Magnetization    2. The field of a magnetized object    3. The auxiliary field    4. Linear and non-linear media 7. Electrodynamics    1. Electromotive force    2. Electromagnetic induction    3. Maxwell’s Equations |
|  |

## 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 |