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

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

**N.B. DO NOT USE HIGHLIGHT, please 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) | **Phys 103 Calculus Applications in Mechanics** | | | |  |
| [Replacing](#Ifapplicable) |  | | | |
| A.2. [Proposal type](#type) | **Course: creation** | | | |
| A.3. [Originator](#Originator) | **Andrea Del Vecchio** | [Home department](#home_dept) | **Physical Sciences** | | |
| A.4. [Context and Rationale](#Rationale) | **This elective one credit course would be a supplement to PHYS 101 and would further explore topics introduced in PHYS 101 by introducing a calculus-based approach to these topics. Since we are removing the calculus-based physics course from the curriculum, this course would allow students to cover the more mathematically rigorous material that is not in PHYS 101. This course is intended primarily for physics majors to prepare them for upper level physics courses, but would allow any student who has taken PHYS 101 and MATH 212 to explore more mathematically rigorous approaches to physics.** | | | | |
| A.5. [Student impact](#student_impact) | **Students would have the opportunity to improve their understanding of the role calculus plays in physics.** | | | | |
| A.6. [Impact on other programs](#impact) | **None.** | | | | |
| A.7. [Resource impact](#Resource) | [*Faculty PT & FT*](#faculty): | **Since this course is only one credit, it will have minimal faculty load impact** | | | |
| [*Library*:](#library) | **none** | | | |
| [*Technology*](#technology) | **none** | | | |
| [*Facilities*](#facilities): | **none** | | | |
| A.8. [Semester effective](#Semester_effective) | **Fall, 2019** | A.9. [Rationale if sooner than next Fall](#Semester_effective) | |  | |
| A.10. INSTRUCTIONS FOR CATALOG COPY: This single file copy must include ALL relevant pages from the college catalog, and show how the catalog will be revised. (1) Go to the “Forms and Information” page on the UCC website. Scroll down until you see the Word files for the current catalog. (2) Download ALL catalog sections relevant for this proposal, including course descriptions and/or other affected programs. (3) Place ALL relevant catalog copy into a single file. Put page breaks between sections and delete any catalog pages not relevant for this proposal. (4) Using the track changes function, revise the catalog pages to demonstrate what the information should look like in next year’s catalog. (5) Check the revised catalog pages against the proposal form, especially making sure that program totals are correct if adding/deleting course credits. If new copy, indicate where it should go in the catalog. If making related proposals a single catalog copy that includes all is acceptable. Send as a separate file along with this form. | | | | | |

B. [NEW OR REVISED COURSES](#delete_if)  **DO NOT use highlight. Delete this whole page if the proposal does not include a new or revised course.**

|  | Old ([for revisions only](#Revisions)) Only include information that is being revised, otherwise leave blank (delete provided examples that do not apply) | New Examples are provided for guidance, delete the ones that do not apply |
| --- | --- | --- |
| B.1. [Course prefix and number](#cours_title) |  | **PHYS 103** |
| B.2. Cross listing number if any |  |  |
| B.3. [Course title](#title) |  | **Calculus Applications in Mechanics** |
| B.4. [Course description](#description) |  | **Students explore calculus-based topics in mechanics including kinematics, work and potential energy, momentum, rotational motion and simple harmonic motion.** |
| B.5. [Prerequisite(s)](#prereqs) |  | **PHYS 101, MATH 212** |
| B.6. [Offered](#Offered) |  | **Fall** |
| B.7. [Contact hours](#contacthours) |  | **1** |
| B.8. [Credit hours](#credits) |  | **1** |
| B.9. [Justify differences if any](#differences) |  | |
| B.10. [Grading system](#grading) |  | **Letter grade** |
| B.11. [Instructional methods](#instr_methods) |  | **|Lecture | Small group |** |
| B.12.[Categories](#required) |  | **Free elective** |
| B.13. Is this an Honors course? |  | **NO** |
| B.14. [General Education](#ge)  N.B. Connections must include at least 50% Standard Classroom instruction. |  | **NO |**  **:** |
| B.15. [How will student performance be evaluated?](#performance) |  | **Attendance | Class participation | Exams |**  **Class Work | Quizzes |** |
| B.16. [Redundancy statement](#competing) |  |  |
| B. 17. Other changes, if any |  | |

| B.18**.** [**Course learning outcomes**](#outcomes)**: List each one in a separate row** | [**Professional Org.Standard(s)**](#standards)**, if relevant** | [**How will each outcome be measured**](#measured)**?** |
| --- | --- | --- |
| 1. Understand the relationship between force, position velocity and acceleration for both a differential and integral perspective. |  | Homework and assessments |
| 2. Understand the relationship between force, work and potential energy |  | Homework and assessments |
| 3. Understand the vector nature of rotational motion and the calculation of cross products. |  | Homework and assessments |
| 4. Understand the physical meaning of differentiation and integration in terms of physics concepts. |  | Homework and assessments |

| B.19. [**Topical outline**](#outline)**: Do NOT insert whole syllabus, we just need a two-tier outline** |
| --- |
| 1. Force and kinematics    1. Derivation of the kinematics equations with both differential and integral calculus    2. Calculating position, velocity and acceleration for both constant and varying acceleration.   2) Work and energy  a) Calculating work as the integral of the dot product of force and displacement  b) The relationship between the force and the potential energy.  3) Momentum  a) Integral definition of impulse  b) Relationship between Newton’s Second Law and the Law of Conservation of Momentum  c) Conservation of momentum problems involving an object with a changing mass  4) Rotational motion  a) Derivation of the rotational kinematic equations  b) The cross product and the vector nature of torque, angular acceleration and angular momentum  c) Integral calculations of moment of inertia  5) Simple harmonic motion  a) The relationship between position, velocity and acceleration of simple harmonic motion.  b) The effects of damping and driving forces on a harmonic oscillator |
|  |

## D. Signatures

* 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.

##### D.1. Approvals: required from programs/departments/deans who originate the proposal. may include multiple departments, e.g., for joint/interdisciplinary prposals.

| Name | Position/affiliation | [Signature](#_Signature" \o "Insert electronic signature, if available, in this column) | Date |
| --- | --- | --- | --- |
| Sarah Knowlton | Chair of Physical Sciences |  |  |
| Earl Simson | Dean of Arts and Sciences |  |  |
|  |  |  |  |

##### D.2. [Acknowledgements](#acknowledge): REQUIRED from OTHER PROGRAMS/DEPARTMENTS IMPACTED BY THE PROPOSAL. SIGNATURE DOES NOT INDICATE APPROVAL, ONLY AWARENESS THAT THE PROPOSAL IS BEING SUBMITTED. CONCERNS SHOULD BE BROUGHT TO THE UCC COMMITTEE MEETING FOR DISCUSSION

| Name | Position/affiliation | [Signature](#Signature_2) | Date |
| --- | --- | --- | --- |
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|  |  |  | Tab to add rows |