# 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): [if not working select “COMMents on rollover” in your Word preferences under view] please read these.

**N.B. DO NOT USE HIGHLIGHT, where choices are given within categories, please DELETE those THAT DO NOT APPLY TO YOUR PROPOSAL. Do not delete numbered categories.**

**ALL numbers in section (A) to be completed, including the impact ones (#5-7), put “none” if that is the case.**

|  |  |  |
| --- | --- | --- |
| A.1. [Course or program](#Proposal) | **rad 432 advanced principles of radiobiology** |  |
| [Replacing](#Ifapplicable)  |  |
| A.2. [Proposal type](#type) | **Course: creation** |
| A.3. [Originator](#Originator) | **Eric Hall** | [Home department](#home_dept) | **Biology/Health Sciences** |
| A.4. [Context and Rationale](#Rationale)  | **In this reorganization of the medical imaging program, new courses are being developed to cover the depth and breadth of content needed for certification as a radiographer.**  |
| A.5. [Student impact](#student_impact) | **Improved readiness for working in the hospital or clinical environment** |
| A.6. [Impact on other programs](#impact)  | **None** |
| A.7. [Resource impact](#Resource) | [*Faculty PT & FT*](#faculty):  | **This course will be taught by LSMI faculty.** |
| [*Library*:](#library) | **None** |
| [*Technology*](#technology) | **None** |
| [*Facilities*](#facilities): | **None** |
| A.8. [Semester effective](#Semester_effective) | **Fall 2020** | 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 single file along with this form. |

B. [NEW OR REVISED COURSES](#delete_if)  **DO NOT use highlight. Do not delete numbered categories, just leave blank if they do not apply. Delete this whole page if the proposal does not include a new or revised course. Always fill in b. 1 and B. 3 for context.**

|  | Old ([for revisions only](#Revisions))ONLY include information that is being revised, otherwise leave blank.  | NewExamples are provided within some of the boxes for guidance, delete just the examples that do not apply. |
| --- | --- | --- |
| B.1. [Course prefix and number](#cours_title)  |  | **RAD 432** |
| B.2. Cross listing number if any |  |  |
| B.3. [Course title](#title)  |  | **Advanced Principles of Radiobiology** |
| B.4. [Course description](#description)  |  | Students learn the concepts of creating and capturing digital images including preprocessing, processing, and postprocessing. Students will also learn principles of radiobiology and radiation protection. |
| B.5. [Prerequisite(s)](#prereqs) |  | **RAD 334** |
| B.6. [Offered](#Offered) |  | **Fall** |
| B.7. [Contact hours](#contacthours)  |  | **4** |
| B.8. [Credit hours](#credits) |  | **4** |
| B.9. [Justify differences if any](#differences) |  |
| B.10. [Grading system](#grading)  |  | **Letter grade**  |
| B.11. [Instructional methods](#instr_methods) |  | **Lecture** |
| B.12.[Categories](#required) |  | **Required for major**  |
| 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 |****category:** |
| B.15. [How will student performance be evaluated?](#performance) |  | **Exams****Quizzes****Assignments** |
| B.16 [Recommended class-size](#class_size" \o "Check appendix XVIII in the UCC Manual for Best Practices) |  | **24** |
| B.17. [Redundancy statement](#competing) |  | **N/A** |
| B. 18. Other changes, if any |  |

| B.19**.** [**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)**?** |
| --- | --- | --- |
| The student will: * Define terminology associated with digital imaging systems.
* Describe the various types of digital receptors.
* Differentiate between computed radiography and direct radiography IRs.
* Recognize the differences between indirect and direct conversion digital IRs.
* Explain the importance of dynamic range in exposure technique selection and image quality.
* Define signal-to-noise ratio (SNR) and contrast-noise ratio (CNR) and explain their importance to digital image quality.
* Explain histogram analysis, automatic rescaling, and lookup tables and their role during image pre-processing to create a quality digital image.
* Differentiate among the vendor-specific types of exposure indicators.
* Compare and contrast the types of display monitors used for diagnostic interpretation and image viewing.
* Recognize image display processing functions including electronic masking, window level and width, subtraction, contrast enhancement, edge enhancement, smoothing, and equalization.
* Define acronyms PACS, DICOM, and HL7.
* Identify methods to measure radiation response.
* Describe physical, chemical and biological factors influencing the radiation response of cells and tissues.
* Recognize the clinical significance of lethal dose (LD).
* Employ dose curves to study relationship between radiation dose levels and the degree of biologic response.
* Examine effects of limited vs. total body exposure.
* Differentiate between somatic and genetic radiation effects and discuss specific diseases or syndromes associated with them.
* Discuss stochastic (probabilistic) and nonstochastic (deterministic) effects.
* Differentiate between stochastic (probabilistic) and nonstochastic (deterministic) effects of radiation exposure.
* Discuss acute radiation syndromes.
* Describe the components and function of automatic exposure control (AEC) devices.
* Describe the concept of ALARA.
* Identify the basis for occupational exposure limits.
* Describe procedures used to verify performance standards for equipment.
* Describe personnel monitoring devices and interpret reports.
 |  | Examinations, quizzes and assignments |

| B.20. [**Topical outline**](#outline)**: DO NOT INSERT WHOLE SYLLABUS, JUST A TWO-TIER TOPIC OUTLINE. Proposals that ignore this request will be returned for revision.** |
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| --- | --- | --- | --- |
| **Week**  | **Lecture**  | **Chapter**  | **Assignment**  |
| 1  | Review syllabus Digital radiography – image quality  | F – 4  C – 28-37  | Homework   |
| 2  | Digital radiography – image quality Digital radiography – post-processing  | F – 4  C – 28-37  | Homework  |
| 3  | Digital radiography – image acquisition CR, DR Digital radiography – PACS, artifacts  | F – 4  C – 28-37  |   |
| 4  | Digital Fluoroscopy  Quality Control & Automatic exposure control  | F – 4  C – 28-37  | Quiz  Homework  |
| 5  | Review for Exam   | F – 4  C – 28-37  | Quiz   |
| 6  | Exam I Dose limits for exposure to ionizing radiation  |  F – 8 C – 27     | Exam   |
| 7  | Overview of cell biology Molecular and cellular radiation biology  |  C – 39, 40  | Quiz   |
| 8  | Early & late deterministic radiation effects on organ systems  |   | Quiz  |
| 9  | Review for Exam  |   |   |
| 10  | Exam II Equipment design for radiation protection & Patient radiation dose during diagnostic x-ray procedures  |   | Exam  |
| 11  | Personnel radiation dose during diagnostic x-ray procedures Radiation monitoring & radioisotopes & protection  |   |   |
| 12  | Chernobyl Documentary   |   | Quiz  |
| 13  | Review for Exam Nuclear Reactor Field Trip  |   |   |
| 14  | Exam III Special considerations on safety in CT & Mammography   Review for Final Exam  |   | Exam  |
| 15  | Review for Final Exam  |   |   |
| FINALS WEEK  | Final Exam  |   | Final exam   |

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## 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 their 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 and a printed signature copy of this whole 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 proposals.

| Name | Position/affiliation | [Signature](#_Signature" \o "Insert electronic signature, if available, in this column) | Date |
| --- | --- | --- | --- |
| Eric Hall | Program Director of Medical Imaging | e-mail confirmation to curriculum@ric.edu | 4/1/2020 |
| Eric Roberts | Chair of Biology | e-mail confirmation to curriculum@ric.edu | 4/1/2020 |
| Earl Simson | Dean of FAS | e-mail confirmation to curriculum@ric.edu | 4/6/2020 |

##### D.2. [Acknowledgements](#acknowledge): REQUIRED from OTHER PROGRAMS/DEPARTMENTS (and their relevant deans if not already included above) that are 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; all faculty are welcome to attend.

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