New Course Request

Indiana University

IUPUI Campus

Check Appropriate Boxes: Undergraduate credit [ ] Graduate credit [ ] Professional credit [ ]

1. School/Division: School of Medicine

2. Academic Subject Code: RAON

3. Course Number: D-602 (must be cleared with University Enrollment Services)

4. Instructor: DesRosiers, C, PhD. / Ewing, M., CMD

5. Course Title: Concepts for Preparation & Planning in Medical Dosimetry

Recommended Abbreviation (Optional): Concepts Prep & Plan Med Dos II

(Limited to 32 characters including spaces)

Fall Semester 2010

6. First time this course is to be offered (Semester/Year):

7. Credit Hours: Fixed at [ ] 1 or Variable from [ ] to [ ]

8. Is this course to be graded S-F (only)? Yes [ ] No [ X ]

9. Is variable title approval being requested? Yes [ ] No [ X ]

10. Course description (not to exceed 50 words) for Bulletin publication:

   This course is intended to give the student a thorough understanding of treatment planning considerations for the patient. It addresses both conventional planning and newer technologies, including IMRT and SBRT. The course will be interactive with a combination of lecture and hands-on computer activities.

11. Lecture Contact Hours: Fixed at [ ] 15 or Variable from [ ] to [ ]

12. Non-Lecture Contact Hours: Fixed at [ ] or Variable from [ ] to [ ]

13. Estimated enrollment: [ ] 2-5 of which [ ] 100% percent are expected to be graduate students.

14. Frequency of scheduling: once / yr. Will this course be required for majors? Yes [ ] for certificate program

15. Justification for new course: new certificate program developed in medical dosimetry

16. Are the necessary reading materials currently available in the appropriate library? [ ] no

17. Please append a complete outline of the proposed course, and indicate instructor (if known), textbooks, and other materials.

18. If this course overlaps with existing courses, please explain with which courses it overlaps and whether this overlap is necessary, desirable, or unimportant.

19. A copy of every new course proposal must be submitted to departments, schools, or divisions in which there may be overlap of the new course with existing courses or areas of strong concern, with instructions that they send comments directly to the originating Curriculum Committee. Please append a list of departments, schools, or divisions thus consulted.

Submitted by: ____________________________ Date: 7/4/09

Department Chairman/Division Director

Dean of Graduate School (when required) Date

Approved by: ____________________________ Date: 7/21/09

Dean

Chancellor/Vice-President

University Enrollment Services

After School/Division approval, forward the last copy (without attachments) to University Enrollment Services for initial processing, and the remaining four copies and attachments to the Campus Chancellor or Vice-President.

UPS 724 University Enrollment Services Final—White; Chancellor/Vice-President—Blue; School/Division—Yellow; Department/Division—Pink; University Enrollment Services Advance—White
NEW COURSE REQUEST

I. Title: Concepts for Preparation and Planning in Medical Dosimetry II
Course # RAON-D602
Course Director: Colleen DesRosiers, Ph.D.
Course Instructor: Marvane M. Ewing, B.S., CMD
Prerequisites: Successful completion of Concepts for Preparation and Planning in Medical Dosimetry I

Suggested Course Abbreviation: Concepts Prep & Plan Med Dos II
Fall Semester 1 credit hour 1 hour /week (15 weeks) (60 min) = 900 minutes

II. Course Description and Rationale
This course is intended to give the dosimetry student a thorough understanding of treatment planning considerations for the patient. It addressed both conventional planning and newer technologies, including IMRT and SBRT. The course will be interactive with a combination of lecture and hands on computer activities.

The primary role of the medical dosimetrist is to provide skilled treatment planning for the delivery of radiation therapy treatments, as well as to be able to creatively find solutions for treatment planning complications. This course will provide the student with the skill to perform complex plans.

III. Educational Objectives
Upon completion of this course the student will be able to:

1. Demonstrate an understanding of how immobilization and positioning techniques affect the patient’s plan and why.

Assignment: Clinical competency. The student will observe a minimum of 5 CT simulation procedures, 2 conventional simulation procedures including at least one stereotactic body frame simulation procedure. The student will perform the virtual simulation independently, with a dosimetrist observer, and describe any errors or potential errors in the simulation process. The virtual simulation procedure will be repeated until the student is able to correctly identify all potential errors as listed in the clinical competency form. (10% of total grade)

2. Recognize standard beam arrangements for specific anatomic sites.

Assessment: The student will perform as written assignment standard techniques for the following anatomic sites: brain, head/neck, lung, breast, abdomen, pelvis, extremities. The written assignment will be reviewed by a dosimetrist and discussed with the student. (10% of total grade)

3. Read and interpret the physicians prescription for the delivery of a radiation therapy
treatment.

Assessment: Clinical competency. The student will observe a dosimetrist performing a treatment plan at least 3 times. The student will then be expected to perform this task independently with a dosimetrist observer. (10% of total grade)

4. Understand the differences between two dimensional planning and three dimensional treatment planning.

Assessment: The student will be expected to pick a treatment site and describe the advantages and disadvantages of 2D vs. 3D treatment planning in writing. The written assignment will be reviewed by a dosimetrist and discussed with the student. (5% of total grade)

5. Evaluate a dose volume histogram and relay that information to the treating physician in a satisfactory manner.

Assessment: Clinical competency. The student will observe a dosimetrist performing a treatment plan at least 3 times. The student will then be expected to perform this task independently with a dosimetrist observer. (10% of total grade)

6. Demonstrate their knowledge of the theory behind intensity modulated radiotherapy, and show evidence of understanding when and why you would use forward planning versus inverse planning.

Assessment: The student will be expected to pick a treatment site and describe the advantages and disadvantages of IMRT treatment in writing. The student will describe the difference between forward and inverse planning. The written assignment will be reviewed by a dosimetrist and discussed with the student. (10% of total grade)

7. Display the differences between compensator based IMRT and MLC based IMRT plans.

Assessment: The student will describe in writing the difference between compensator based IMRT and MLC based IMRT plans. The student will need to independently access references on the topic. The written assignment will be reviewed by a dosimetrist and discussed with the student. (5% of total grade)

8. Demonstrate their knowledge of quality assurance procedures for the technical accuracy and implementation of the treatment plan.

Assessment: Clinical competency. The student will observe a physicist performing a formal review of a treatment plan 3 times before performing the quality assurance procedures independently with a physicist observer. The student will be able to identify all errors and potential errors. They will also be able to characterize errors as “implementation errors” and “dosimetric errors”. They will not pass the competency until they are able to perform all activities from the completion of the treatment plan to the treatment implementation. (20% total grade)
9. Understand the theory behind the dose prescriptions for stereotactic radiation therapy, how SBRT plans are created and verify their understanding of dose limits for SBRT.

Assessment: The student will be provided with an RTOG SBRT protocol. They will be expected to answer a series of questions in writing. The written assignment will be reviewed by a dosimetrist and discussed with the student. (10% of total grade)

10. Locate forms contained in the electronic medical record and demonstrate a knowledge of how those forms are used.

Assessment: Clinical competency. The student will observe a dosimetrist accessing the electronic medical record associated with a patient plan at least 3 times. The student will then be expected to perform this task independently with a dosimetrist observer. (10% of total grade)

IV. Course Content – Syllabus
Course content will be drawn from a variety of sources with prepared manuals provided for each section of the course.

1. CT and Simulation (1 hour - 1 session)
   a. Immobilization Techniques and Devices
   b. Positioning Considerations
   c. Technical Considerations for the dosimetrist

2. Conventional Dosimetry Planning (4 hours – 4 sessions)
   a. Importing Images
   b. Registration of Images
   c. Conventional 2D and 3D planning
   d. Recognizing standard beam arrangements
   e. Dose Volume Histogram (DVH) evaluation
   f. Electronic Medical Record Charting

3. IMRT (Intensity Modulated Radiation Therapy) (4 hours – 4 sessions)
   a. Contouring considerations for IMRT
   b. Forward Planning (Electronic Compensators)
   c. Beam Arrangements for IMRT
   d. Inverse Planning using Optimization techniques
   e. Calculations of Segments / Isodoses with Sliding Windows vs Multiple Static Segments
   f. Compensator Based IMRT planning
   g. Quality Assurance Checks

4. SBRT (Stereotactic Body Radiation Therapy) (4 hours – 4 sessions)
   Linac Based with Body Frame
   a. Simulation and Setup with the Frame
b. Contouring considerations for SBRT

c. Understanding Dose Shaping Methods

d. Understanding the SBRT Prescription

e. Understanding Normal Structure limits with SBRT

f. Beam Arrangements with SBRT

g. Dose Calculation, DVH Evaluation, MU check

h. Quality Assurance – frame measurements / cone beam

5. Maintaining the Electronic Medical Record (1 hours – 1 session)

a. Use of Forms

b. Understanding the Therapy Chart

c. Billing / Charging Guidelines

d. Legal Considerations

V. Required and Recommended Texts

Required – not available at this time

Recommended:

1. Radiation Therapy Planning: Including Problems and Solutions, not yet released (projected Oct 2009); Bentel, G.


VI. Evaluation and Grading

This course will include a combination of didactic lectures, independent reading and hands on assignments. All material, whether didactic or experiential, will be tested by written assignments and clinical competencies as described in the course objectives section. The weighting of the grading for individual topics are given in the course objectives section.

The Indiana University grading scale will be used for this course.

<table>
<thead>
<tr>
<th>GRADING SCALE</th>
<th>Letter grade</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>93-100</td>
<td></td>
</tr>
<tr>
<td>A-</td>
<td>90-92.99</td>
<td></td>
</tr>
<tr>
<td>B+</td>
<td>87-89.99</td>
<td></td>
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<tr>
<td>B</td>
<td>82-86.99</td>
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<tr>
<td>B-</td>
<td>78-81.99</td>
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<tr>
<td>C+</td>
<td>75-77.99</td>
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<tr>
<td>F (not passing)</td>
<td>&lt;75</td>
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</tbody>
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unacceptable behavior and cheating. Academic misconduct of any sort will not be tolerated and will be dealt with as outlined in the IU/PUI Code of Student Rights, Responsibilities, and Conduct, which can be viewed at:

http://www.iupui.edu/code/

Examples of misconduct include but are not limited to:

VII. Cheating and Plagiarism:

Students are instructed to make themselves aware of University regulations concerning plagiarism, the maintenance of academic honesty and the definitions of
1. Cheating
   A student must not use or attempt to use unauthorized assistance, materials, information, or study aids in any academic exercise.

2. Fabrication
   A student must not falsify or invent any information or data in an academic exercise including, but not limited to, records or reports, laboratory results, and citations to the sources of information.

3. Plagiarism
   A student must not adopt or reproduce ideas, words, or statements of another person without appropriate acknowledgment. A student must give credit to the originality of others and acknowledge an indebtedness whenever he or she does any of the following:
   a. Quotes another person’s actual words, either oral or written.
   b. Paraphrases another person’s words, either oral or written.
   c. Uses another person’s idea, opinion, or theory, or
   d. Borrows facts, statistics, or other illustrative material, unless the information is common knowledge.

4. Interference
   a. A student must not steal, change, destroy, or impede another student’s work.
   b. A student must not give or offer a bribe, promise favors, or make threats with the intention of affecting a grade or the evaluation of academic performance.

Potential consequences for academic misconduct:

If the instructor has information that one of his/her students committed an act of academic misconduct, the faculty member will hold an informal conference with the student. The conference will be prompt and private. If the faculty member concludes that the student is responsible for the misconduct, then the faculty member will impose an appropriate academic sanction (i.e., lower or failing grade on the assignment, assessing a lower or failing grade for the course).

VIII. Americans with Disabilities Act:
If you need any special accommodations due to a disability, please contact Adaptive Educational Services at (317)-274-3241. The office is located in CA 001E.