New Course Request

Indiana University

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

1. School/Division: School of Medicine
2. Academic Subject Code: RAON
3. Course Number: D 601 (must be cleared with University Enrollment Services)
4. Instructor: DesRosiers, Colleen, Ewing, Marvene, CMD
5. Course Title: Concepts for Preparation & Planning in Medical Dosimetry
   Recommended Abbreviation (Optional): Concepts Prep & Plan Med Dos I

   (Limited to 32 Characters including spaces)
6. First time this course is to be offered (Semester/Year): Summer Session II 2010
7. Credit Hours: Fixed at _______ or Variable from _______ to _______.
8. Is this course to be graded S-F (only)? Yes [X] No [ ]
9. Is variable title approval being requested? Yes [X] No [ ]
10. Course description (not to exceed 50 words) for Bulletin publication:
    This course is an introduction to the skills and technologies needed to pursue a
    career in medical dosimetry. It is designed for the student who has already completed
    a program in Radiation Therapy Technology and will give the student background
    information on both the professional and technological side.

11. Lecture Contact Hours: Fixed at _______ or Variable from _______ to _______.
12. Non-Lecture Contact Hours: Fixed at _______ or Variable from _______ to _______.
13. Estimated enrollment: _______ of which _______ percent are expected to be graduate students.
14. Frequency of scheduling: once/year. Will this course be required for majors? Yes, certificate program
15. Justification for new course: establishment of new certificate program in medical dosimetry
16. Are the necessary reading materials currently available in the appropriate library? Some
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: [Signature] Date 7/16/09
Department Chairman/Division Director

Dean of Graduate School (when required) Date

Approved by: [Signature] Date 7/21/09
Dean

Chancellor/Vice-President Date

University Enrollment Services Date

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 I
Course #   RAON-D601
Course Director: Colleen DesRosiers, Ph.D.
Instructor: Marlene M. Ewing, B.S., CMD
Prerequisites: Acceptance into the “Graduate Certificate Program in
Medical Dosimetry”

Suggested Course Abbreviation: Concepts Prep & Plan Med Dos I
Summer Session II  2 credit hours  4 hr/week (6wks)(60min)= 1440 minutes

II. Course Description and Rationale
This course is an introduction to the skills and technologies needed to pursue a career in medical
dosimetry. It is designed for the student who has already completed a program in Radiation Therapy
Technology and will give the student background information on both the professional and
technological side.

The course will cover a number of topics that are required by the American Association of Medical
Dosimetry Curriculum Guide and will provide the student with information needed for working
with patient information and with some basic skills in dosimetry.

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

1. Demonstrate an understanding of professional relationships with patients and with
coworkers and well as their own professional development.

Assessment: The student will be asked to review documentation provided by the
professional certifying bodies (Medical Dosimetry Certification Board, American
Association of Physicists in Medicine) and departmental policies and procedures. The
student will be given a list of relevant questions pertaining to professional behavior. Their
answers will be reviewed by a dosimetrist in the department and reviewed with the
student(s) in a classroom setting. (5% total grade)

2. Demonstrate an understanding of legal issues in medical dosimetry.

Assessment: The student will be asked to review documentation provided by the
professional certifying bodies (Medical Dosimetry Certification Board, American
Association of Physicists in Medicine) and departmental policies and procedures. The
student will be given a list of relevant questions pertaining to legal issues. Their answers
will be reviewed by a dosimetrist in the department and reviewed with the student(s) in a
classroom setting. (5% total grade)
3. Perform manual calculations of dose for radiation therapy treatments as well as perform other more specialized calculations for positioning and setup.

Assessment: The student will be provided a series of worksheets containing mathematical calculation of treatment machine settings pertaining to item #2 in the Course Content description below. The student(s)' answers will be reviewed by a dosimetrist or physicist and discussed with the student. Any problems performed incorrectly will be repeated until the type of calculation can be performed correctly. (25% total grade)

4. Apply mathematical concepts as needed to perform the above calculations.

Assessment: Worksheets will be provided to the student which will be made up of problems pertaining to item #3 below. The student(s)' answers will be reviewed by a dosimetrist or physicist and discussed with the student. Any problems performed incorrectly will be repeated until the type of calculation can be performed correctly. (15% total grade)

5. Identify imaging techniques for localization of target volumes and normal tissues.

Assessment: Evaluation of the student will be performed in a “clinical competency” format whereby the student will be tested individually with a dosimetrist. The timeframe for the evaluation will be dependent on the readiness of the student but the student must test successfully prior to the completion of the course. (10% total grade)

6. Identify normal tissue volumes of sectional anatomy on CT, MR and PET.

Assessment: Evaluation of the student will be performed in a “clinical competency” format whereby the student will be tested individually with a dosimetrist. The timeframe for the evaluation will be dependent on the readiness of the student but the student must test successfully prior to the completion of the course. (10% total grade)

7. Understand the signs of cancer symptoms and demonstrate a knowledge of cancer treatment modalities.

Assessment: The student will be provided with reading materials consistent with American Cancer Society and American College of Radiology standards and recommendations. The student will be expected to answer questions in written format which will be reviewed by a dosimetrist. The student will also be expected to participate in group discussions and perform a review on a recent journal publication in a seminar format. (15% total grade)

8. Apply computer technology and networking skills within the dosimetry setting.

Assessment: Evaluation of the student will be performed in a “clinical competency” format whereby the student will be tested individually with a dosimetrist. The timeframe for the evaluation will be dependent on the readiness of the student but the student must test successfully prior to the completion of the course. (15% 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. Professional Relations and Responsibilities (2 hours – 1 session)
   a. Ethical Conduct
   b. Professional / Legal perspective
   c. Division of Responsibilities
   d. Relationships and Insurance
   e. Liability and Defensive medical dosimetry
   f. Professional – Patient relationships
   g. Malpractice Issues
   h. Professional Development

2. External Beam Monitor Unit Calculations (2 hours – 1 session)
   a. Dosimetric Quantities
   b. Central Axis Dose Calculations
   c. Equivalent Square Calculations
   d. Irregular Field Point Dose Calculations
   e. Off-axis Monitor unit (MU) Calculations
   f. SAD versus SSD, Photon MU calculations
   g. Electron MU calculations

3. Applied Mathematics Review for Dosimetry-Specific Problems (4 hours – 2 sessions)
   a. Applications with Geometric and Trigonometric concepts.
   b. Algebra review of Linear functions & Graphing
   c. Exponential notation
   d. Exponential / Logarithmic notation
   e. Scientific notation
   f. Metric System review

4. Imaging/Contouring (2 hours – 1 session)
   a. Identifying modalities for the localization of treatment targets, including x-ray, fluoroscopy, simulators, computed tomography (CT), ultrasound, nuclear medicine (PET) and magnetic resonance (MR)
   b. Applications for medical dosimetry with each of the modalities identified.
   c. Fusion/Registration of images with CT/Pet/MR.

5. Sectional Anatomy/Contouring (4 hours – 2 sessions)
   a. Review of Sectional Anatomy for identifying normal tissues and volumes in the body.
   b. Contouring with the Treatment Planning System.
6. Cancer Patient Management
   a. Signs and Symptoms
   b. Cancer Treatment
   c. Cancer Management

7. Radiation Protection
   a. Dose equivalent
   b. Protection Regulations
   c. Background Sources of Radiation
   d. Structural Shielding Design
   e. Personnel Monitoring
   f. NRC Regulations
   g. Radiation Monitoring Instruments
   h. Radiation Surveys

8. Computer Technology/Networking
   a. Hardware, Software, Networking
   b. Treatment Planning Systems for Radiation Therapy Planning

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.;
   2. Sectional Anatomy Text (to be determined)

VI. Evaluation and Grading
This course will be primarily a didactic course and will be evaluated on the basis of scheduled assignments/clinical competency exams. The breakdown of the grading per topic will be weighted as described in the “Educational Objectives” section. There will also be access to radiation oncology treatment planning systems for some “hands on” assignments. Competencies will also be assessed for those assignments. Some of the topics will be taught by guest lecturers, e.g., the Radiation Safety Office at the IU School of Medicine will provide the lectures for the Radiation Protection section.

<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>
</tr>
<tr>
<td>B</td>
<td>82-86.99</td>
<td></td>
</tr>
<tr>
<td>B-</td>
<td>78-81.99</td>
<td></td>
</tr>
<tr>
<td>C+</td>
<td>75-77.99</td>
<td></td>
</tr>
<tr>
<td>F (not passing)</td>
<td>&lt;75</td>
<td></td>
</tr>
</tbody>
</table>

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

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 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:

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.