<table>
<thead>
<tr>
<th>Present</th>
<th>Proposed</th>
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<tbody>
<tr>
<td>Contact Person: E. Ishmael Parsai</td>
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<td><strong>College</strong>: Medicine</td>
<td><strong>College</strong>:</td>
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<td><strong>Dept/Academic Unit</strong>: Radiation Oncology</td>
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<tr>
<td><strong>Course Alpha/Numeric</strong>: MPHY 6020</td>
<td><strong>Course Alpha/Numeric</strong>: Survey of Diagnostic Medical Imaging II</td>
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<tr>
<td><strong>Course title</strong>: Radiation Physics II</td>
<td><strong>Course title</strong>:</td>
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<tr>
<td><strong>Credit hours</strong>: Fixed 3 or Variable:</td>
<td><strong>Credit hours</strong>: Fixed 3 or Variable:</td>
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**Cross Listings:**
- MPHY-8020

**Prerequisites(s) (if more than 50 characters, please place it in Catalog Description):**
None

**Co-requisites(s) (if more than 50 characters, please place it in Catalog Description):**
None

**Catalog Description (only if changed) 75 words max:**
This course is a continuation of Radiation Physics I and includes the radioactive decay principles, basics of nuclear medicine imaging including SPECT and PET, basic concepts of NMR and MR imaging, and the principles of ultrasound including Doppler ultrasound.

**Catalog Description (only if changed) 75 words max:**
This course builds on the material taught in MPH6010/8010, and discusses advanced concepts in medical imaging including functional MRI, SPECT, and PET imaging. Details of radioactivity & nuclear transformation, radionuclide production & radiopharmaceuticals, radiation detection and measurement and scintillation camera will be covered. advanced discussions on CT and US will also be presented.

Date Added: 4-28-14
Graduate Council Approved: 4-29-14
To Provost: 5-8-14
Has course content changed? Yes

This course was second course following the Radiation Physics I where it was not clear that it is a diagnostic survey course. Moreover we are restructuring our course curriculum to be more in line with CAMPEP and ABR requirements for national accreditation and to better prepare our students for board certification. The new course has specific title and content to reflect the course curriculum.

Proposed Effective Term 2014 40 (Fall) List any course(s) to be deleted

Attach new syllabus reflecting course modifications.
Attach additional documents if necessary.

Course Approval
Department Curriculum Authority
Department Chairperson
College Curriculum Authority or Chair
College Dean
Graduate Council
Dean of Graduate Studies
Office of the Provost

For Administrative Use Only
Effective Date
CIP Code
Subsidy Taxonomy
Program Code
Instruction Level
18. RADIOACTIVITY AND NUCLEAR TRANSFORMATION
   18.1. Radionuclide Decay Terms and Relationships
   18.2. Nuclear Transformation

19. RADIONUCLIDE PRODUCTION & RADIOPHARMACEUTICALS
   19.1. Radionuclide Production
   19.2. Radiopharmaceuticals
   19.3. Regulatory Issues

20. RADIATION DETECTION AND MEASUREMENT
   20.1. Types of Detectors
   20.2. Gas-Filled Detectors
   20.3. Scintillation Detectors
   20.4. Semiconductor Detectors
   20.5. Pulse Height Spectroscopy
   20.6. Nonimaging Detector Applications
   20.7. Counting Statistics

21. NUCLEAR IMAGING-THE SCINTILLATION CAMERA
   21.2. Computers in Nuclear Imaging
22. NUCLEAR IMAGING-EMISSION TOMOGRAPHY
   22.1. Single Photon Emission Computed Tomography (SPECT)
   22.2. Positron Emission Tomography (PET)

14. NUCLEAR MAGNETIC RESONANCE
   14.1. Magnetization Properties
   14.2. Generation and Detection of the MR Signal
   14.3. Pulse Sequences
   14.4. Spin-Echo
   14.5. Inversion Recovery
   14.6. Gradient Recalled Echo
   14.7. Signal from Flow
   14.8. Perfusion and Diffusion Contrast
   14.9. Magnetization Transfer Contrast

15. MAGNETIC RESONANCE IMAGING (MRI)
   15.1. Localization of the MR Signal
   15.2. k-space Data Acquisition and Image Reconstruction
   15.3. Three-Dimensional Fourier Transform Image Acquisition
   15.4. Image Characteristics
   15.5. Angiography and Magnetization Transfer Contrast
   15.6. Artifacts
   15.7. Instrumentation
   15.8. Safety and Bioeffects

16. ULTRASOUND
   16.1. Characteristics of Sound
   16.2. Interactions of Ultrasound with Matter
   16.3. Transducers
   16.4. Beam Properties
   16.5. Image Data Acquisition
   16.6. Image Quality and Artifacts
   16.7. Doppler Ultrasound
   16.8. System Performance and Quality Assurance
   16.9. Acoustic Power and Bioeffects