

**2012-2013 Syllabus**  
**Physics of Radiation Therapy for Residents-Technology, Quality, and Safety**

Time of Meeting: Thursdays from 7:30 – 8:30 AM

Room: Smilow Classroom LL 412

Text: *Physics of Radiation Therapy*, Faiz M. Khan

| <b>Date</b> | <b>Chapter</b>   | <b>Instructor</b> |
|-------------|--|-------------------|
| 12-Jul-12   | <i>Introduction: Treatment Planning</i>  | Kim               |
| 19-Jul-12   | <i>Atomic and Nuclear Structure: The Atom</i>                                      | Guo               |
| 26-Jul-12   | <i>Beam Production: Basic Physics of X-Ray Beam Production</i>                     | Guo               |
| 02-Aug-12   | <i>Beam Production: Generation of Beams</i>  | Guo               |
| 09-Aug-12   | <i>Treatment Machines: Linacs</i>  | Carlson           |
| 16-Aug-12   | <i>Treatment Machines: Linac Collimation Systems and Other Teletherapy</i>         | Carlson           |
| 23-Aug-12   | <i>Radiation Interaction: Interactions of X-and Gamma-rays with Matter</i>         | Carlson           |
| 30-Aug-12   | <i>Radiation Interaction: Attenuation of Photon Beams</i>                          | Carlson           |
| 06-Sep-12   | <i>Radiation Interaction: Interactions of Particulate Radiation</i>                | Carlson           |
| 13-Sep-12   | <i>Beam Quality &amp; Dose: Monoenergetic / Polyenergetic Bremsstrahlung Beams</i> | Kamath            |
| 20-Sep-12   | <i>Beam Quality &amp; Dose: Dose Quantities and Units</i>                          | Kamath            |
| 27-Sep-12   | <i>Radiation Measurement &amp; Calibration: Calculation of Dose</i>                | Ahmad             |
| 04-Oct-12   | <i>Radiation Measurement &amp; Calibration: Dose Output Calibration</i>            | Ahmad             |
| 11-Oct-12   | <i>Radiation Measurement &amp; Calibration: Clinical Dosimetry</i>                 | Ahmad             |
| 18-Oct-12   | <i>Review</i>  |                   |
| 25-Oct-12   | <i>Photon EBRT: Dosimetry Concepts (Part I)</i>                                    | Lincoln           |
| 01-Nov-12   | <i>Photon EBRT: Dosimetry Concepts (Part II)</i>                                   | Lincoln           |
| 08-Nov-12   | <i>Photon EBRT: System of Dose Calculations</i>                                    | Lincoln           |
| 15-Nov-12   | <i>Photon EBRT: Computerized Planning</i>  | Liu               |
| 29-Nov-12   | <i>Photon EBRT: Computerized Treatment Planning Strategies</i>                     | Liu               |
| 06-Dec-12   | <i>Photon EBRT: Surface Corrections and Heterogeneity Calculations</i>             | Liu               |
| 13-Dec-12   | <i>Photon EBRT: Adjoining Fields and Special Dosimetry Problems</i>                | Liu               |
| 20-Dec-12   | <i>Electron EBRT: Basic Characteristics</i>  | Deng              |
| 27-Dec-12   | <i>Electron EBRT: Treatment Planning</i>   | Deng              |
| 03-Jan-13   | <i>EBRT QA: Overview of QA in Radiation Therapy</i>                                | Deng              |
| 10-Jan-13   | <i>EBRT QA: Linac and Imaging QA</i>   | Deng              |
| 17-Jan-13   | <i>EBRT Treatment Setup: Immobilization &amp; Positioning</i>                      | Liu               |
| 24-Jan-13   | <i>3DCRT: Concepts &amp; Treatment Planning</i>                                    | Chen              |
| 31-Jan-13   | <i>3DCRT: Plan Evaluation &amp; Comparison</i>                                     | Chen              |
| 07-Feb-13   | <i>IMRT: Concepts &amp; Delivery Systems</i>                                       | Chen              |
| 14-Feb-13   | <i>IMRT: Dose Prescription &amp; Inverse Planning</i>                              | Chen              |
| 21-Feb-13   | <i>IMRT: QA</i>  | Chen              |
| 28-Feb-13   | <i>Special Procedure: Cranial SRS</i>  | Bond              |
| 07-Mar-13   | <i>Special Procedure: SBRT</i>   | Bond              |
| 14-Mar-13   | <i>Special Procedure: TBI &amp; TSET</i>   | Bond              |

|             |   |                   |
|-------------|---|-------------------|
| 21-Mar-13   | <i>Brachy</i> : Radioactivity, Decay, Radioactive Sources & Calibration | Bond              |
| 28-Mar-13   | <i>Brachy</i> : Calculations of Dose Distributions                      | Bond              |
| <b>Date</b> | <b>Chapter</b>  | <b>Instructor</b> |
| 04-Apr-13   | <i>Brachy</i> : Implantation Techniques                                 | Bond              |
| 11-Apr-13   | <i>Brachy</i> : Systems of Implant Dosimetry                            | Bond              |
| 18-Apr-13   | <i>Brachy</i> : QA and Safety   | Bond              |
| 25-Apr-13   | Radiopharmaceutical Physics   | Bond              |
| 02-May-13   | <i>Particle Therapy</i> : Delivery, Planning & Biology                  | Su                |
| 09-May-13   | <i>RT Imaging</i> : Radiography Fundamentals / Informatics              | Chu               |
| 16-May-13   | <i>RT Imaging</i> : CT and PET  | Chu               |
| 23-May-13   | <i>RT Imaging</i> : MRI and Ultrasound                                  | Chu               |
| 30-May-13   | Radiation Safety and Shielding  | Bohan             |
| 06-Jun-13   | Radiation Incidents & Bioterrorism Response Training                    | Bohan             |
|             |   |                   |