A Course in Radiotherapy Physics

7 – 11 November 2017
Radiation Dosimetry, Imaging for Radiotherapy, Treatment Planning and Patient Specific Dosimetry (Sutton Site)

6 – 10 March 2018
Accelerator design and Quality Assurance, Radiobiology, Brachytherapy and Radiotherapy Verification Imaging (Chelsea Site)

This course has been accredited per week by:

RCR CPD 26 Credits


Course Organizers: Ms M Bidmead & Dr V Hansen
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Course Lecturers
Dr. H Bainbridge, Dr. J Bedford, Ms. M Bidmead, Mrs. I Blasaik-Wal, Mr. P Bownes,
Mrs. H Chejecka-Sszczgielska, Mr W Connolly, Dr. V Cosgrove, Professor R Dale, Dr. G Flux, Dr. A Garton, Dr A Gasnier, Dr. S Guildford, Dr. S Hafeez, Dr. V Hansen, Dr. I Hanson, Dr. E Harris, Ms. M Hawkins, Mr. M James, Dr. T Jordan, Mr. D King, Dr. A Kirby, Professor C Kirisits, Dr. S Lalondrelle, Professor P Mayles, Dr. H McNair, Mrs. C Meehan ,Mr. R Moore, Dr. I Murray, Professor A Nahum, Mr M Najem, Mrs. O Naismith, Dr. K Newbold, Dr. S Nill, Professor U Oelfke, Dr. H Porter, Ms K Roberts, Professor C Rowbottom, Dr. M Schmidt, Mr M Seithel, Mr. G Smyth, Dr. C South, Dr. A Taylor, Dr. M Thomas, Mr. J Thurston, Mr. R Trouncer, Professor M van Herk & Professor F Verhaegen.

Hands on session on Saturday morning -1pm

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<th>November 2017</th>
<th>March 2018</th>
<th>Both weeks</th>
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<td>Lectures &amp; practicals</td>
<td>£750.00</td>
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<td>External PhD Students</td>
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<td>Individual weekdays</td>
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Radiation Dosimetry, Imaging for Radiotherapy, Treatment Planning and Patient Specific Dosimetry (Sutton site)

Provisional Programmes

Day One: Fundamentals Radiation Dosimetry (Tuesday 7th November 2017)
- Photon Interaction Mechanisms
- Electron Interaction Mechanisms
- Fundamental Principles I & 2 of Dosimetry
- Characteristics & Calculations of Photon Beams
- Radiotherapy & Cancer specifically Lung Cancer
- Ionisation Chamber Design and Measurements
- Practical Implementing of New Techniques in the Clinic

Course Meal

Day Two: Imaging for Radiotherapy (Wednesday 8th November 2017)
- Applications of Monte-Carlo Methods
- MR Imaging for Radiotherapy Planning
- PET Imaging for Radiotherapy Planning
- Treatment Planning Margins: ICRU 50, 62 & 83
- Stereotactic Body Radiotherapy (SBRT) for Lung Tumours
- Photon Beam Algorithms in Treatment Planning
- Quality Control in Treatment Planning/Checking

Day Three: Treatment Planning (Thursday 9th November 2017)
- Evaluation Tools in Treatment Planning
- Prostate Cancer: XBRT Techniques & Trials
- Intensity Modulated Radiotherapy Optimization Algorithms
- Electron Beam Therapy in Clinical Practice
- Inverse Treatment Planning IMRT & VMAT
- Large Field Techniques in Radiotherapy
- Dosimetry for Molecular Radiotherapy

Day Four: Patient Specific Dosimetry (Friday 10th November 2017)
- Radiotherapy Head & Neck Cancer
- Radiotherapy for Breast Cancer: Current and Future Practice
- Adaptive Radiotherapy for Bladder Cancer in Clinical Practice
- Radiotherapy for Liver Tumours & Oesophageal
- Radiocromatic Film Dosimetry
- In Vivo Dosimetry for Point Dose Measurements
- Verification and Image Based Dosimetry for IMRT
- Radiotherapy with Protons and Heavy Ions

Cheese & Wine

Accelarator design and Quality Control, Radiobiology, Brachytherapy and Radiotherapy Verification Imaging (Chelsea site)

Day One: Accelerator Design & QA (Tuesday 6th March 2018)
- Medical Electron Linear Accelerators
- Production of a Clinical Beam
- Multileaf Collimators: Characteristics & Commissioning
- Accuracy & Quality in Radiotherapy: An overview
- kV X-ray Units
- Cyberknife
- Tomotherapy & Gamma Knife
- Quality Control in Linacs

Course Meal

Day Two: Radiobiology (Wednesday 7th March 2018)
- Introduction to Cell Biology
- Tumour Cell Radiobiology
- Radiobiology of Normal Tissues
- Fractionation & Iso-effect in Radiotherapy
- Modelling the probability of Tumour Control (TCP)
- Practical use of Radiobiology in Treatment Planning
- Modelling Normal Tissue Complication Probability
- Compensation for Treatment Gaps in Radiotherapy

Day Three: Brachytherapy (Thursday 8th March 2018)
- Calibration and QA of Brachytherapy Sources
- Intracavitary Dosimetry
- The Radiobiology of Brachytherapy
- Gynaecology Cancers
- 3D Image based Brachytherapy Planning
- Transperineal Prostate Brachytherapy
- Radiation Protection issues in Brachytherapy
- Radiation Protection in External Beam Radiotherapy

Day Four: Verification Imaging (Friday 9th March 2018)
- Quality Assurance in Clinical Trials
- IGRT: Accuracy, Frequency & Dose
- Image Handling in Radiotherapy
- IGRT Techniques
- Errors & Margins in IGRT
- EPID Imaging in Routine Practice, Dosimetry & Quality Control
- Clinical Indications for Brachytherapy
- MRI Linacs

Cheese & Wine

This course provides a practical and theoretical background to Radiotherapy with its main focus on Radiotherapy Physics aspects. The curriculum covers many aspects and each course includes hands-on practical session on Saturday. Included in the full cost of the course are a set of lecture notes, a CD of the presentations, lunches, refreshments, cheese & wine and a course dinner.