A Course in Radiotherapy Physics

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

6 – 10 November 2018
Radiation Dosimetry, Imaging for Radiotherapy, Treatment Planning and Patient Specific Dosimetry (Sutton Site)

www.icr.ac.uk/studying-at-the-icr/opportunities-for-clinicians/radiotherapy-and-imaging-training-courses.

Course administrator.
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Key to external lecturers
Dr. A Backshall, Dr. H Bainbridge, Dr. J Bedford, Ms. M Bidmead, Mrs. I Blasaik-Wal, Mr. P Bownes, Dr E Castellano, Mrs. H Chejecka-Szczgielska, Dr. V Cosgrove, Professor R Dale, Dr. G Flux, Mr Tony Greener, Dr. S Guildford, Dr. S Hafeez, Dr. V Hansen, Dr. I Hanson, Dr. E Harris, Dr. M Hawkins, Dr. W Ingram, Mr. M James, Ms. C Jones, Mr. T Jordan, Mr. D King, Dr. A Kirby, Professor C Kirisits., Dr. S Lalondrelle, Professor P Mayles, Dr. H McNair, Mrs. C Meehan, Mr. A Mitchell, Mr. R Moore, Dr. I Murray, Professor A Nahum, Mrs. O Naismith, Dr. K Newbold, Dr. S Nill, Dr. H Porter, Professor C Rowbottom, Dr. M Schmidt, Dr. M Schwarz, Mr. G Smyth, Dr. N Somaiah, Dr. C South, Dr. A Taylor, Dr. M Thomas, Mr. J Thurston, Mr. R Trouncer, Professor M van Herk, & Professor F Verhaegen.
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 link to the presentations, lunches, refreshments, cheese & wine and a course meal in a local restaurant.

Day One: Accelerators (Tuesday 6th March 2018)
- Medical Electron Linear Accelerators
- Production of a Clinical Beam
- Multileaf Collimators: Characteristics and Commissioning
- Accuracy and Quality in Radiotherapy: An Overview
- Extremes I: kV X-ray Units
- Extremes II: Cyberknife
- Extremes III: Tomotherapy
- Quality Control of Linacs

Course Meal

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

Day Three: Brachytherapy (Thursday 8th March 2018)
- Calibration & QA of Brachytherapy
- Intracavitary Dosimetry
- The Radiobiology of Brachytherapy
- Gynaecology Cancers
- 3D Image based Brachytherapy Planning
- Transperineal Prostate Brachytherapy
- Radiation Protection Issues in Brachytherapy
- Clinical Indication for Brachytherapy

Day Four: Verification Imaging (Friday 9th March 2018)
- Quality Assurance in Clinical Trials
- Image Guidance in Radiotherapy: Accuracy, Frequency Dose
- Image Handling in Radiotherapy
- IGRT Techniques
- Errors & Margins in Image Guided Radiation Therapy
- EPID Imaging in Routine Practice, Dosimetry & Quality Control
- Radiation Protection in Radiotherapy
- MR Guided Radiation Therapy

Cheese & Wine Evening

Day One: Fundamentals (Tuesday 6th November 2018)
- Photon Interaction Mechanisms
- Electron Interaction Mechanisms
- Fundamental Principles of Dosimetry I
- Fundamental Principles of Dosimetry II
- Ionisation Chamber Design and Measurements
- Characteristics and Calculations for Photon Beams
- Radiotherapy and Cancer specific Lung Cancer
- Practical Implementing of New Techniques

Course Meal

Day Two: Imaging for Radiotherapy (Wednesday 7th November 2018)
- Applications of Monte-Carlo Methods
- Treatment Planning Margins; ICRU 50, 62 and 83
- MR Imaging for Radiotherapy Planning
- PET Imaging for Radiotherapy Planning.
- Photon Beam Algorithms
- CT & CBCT for Radiotherapy Planning
- Quality Control in Treatment Planning

Day Three: Treatment Planning (Thursday 8th November 2018)
- Evaluation Tools in Treatment Planning
- Prostate Cancer: XBRT Techniques and Trials
- Oesophageal and Liver Tumours
- Intensity Modulated Radiotherapy Algorithms (IMRT)
- Inverse Treatment Planning for IMRT & VMAT
- Dosimetry for Molecular Radiotherapy
- Electron Beam Therapy in Clinical Practice

Day Four: Patient Specific Dosimetry (Friday 9th November 2018)
- Radiotherapy of the Head and Neck
- Adaptive Radiotherapy for Bladder Cancer in Clinical Practice
- Radiotherapy for Breast Cancer: Current and Future Practice
- Radiotherapy with Protons
- Radiochromic Film Dosimetry
- Verification and Image based Dosimetry for IMRT
- In Vivo Dosimetry for Point Measurements
- Large Field Techniques in Radiotherapy
- Stereotactic Body Radiotherapy (SBRT) for lung tumours

Cheese & Wine Evening