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University	Offer	Link
Edinburgh	Biological physics (Option in year 4 or 5, 5 ECTS) : Use of statistical thermodynamics to make predictions "from the folding of a protein into a unique three-dimensional structure within a reasonable timeframe, through the motions of proteins to drive biological processes, to the locomotion of bacterial cells. " 1. Demonstrate an understanding of the structure of cells, and the major components within a cell. 2. Recognise that biological systems are far from equilibrium. 3. Understand the importance of diffusion, random walks and entropy in biological systems. 4. Understand the importance of cooperativity in biology. 5. Recognise and communicate the different approaches used in Biological and Physical research. Medical physics (Option in year 4 or 5, 5 ECTS) : 1. Understand the detailed interactions of radiation with matter and biological tissue. Apply this knowledge to understand a range of radiotherapy techniques 2. Understand the detectors and methods used to monitor radiation dose and biological damage 3. Understand the principles of MRI, SPECT, PET and ultrasound imaging and how it is realised in practical devices 4. Apply computer simulations to investigate aspects of medical physics and detector design	http://www.drps.ed.ac.uk/19-20/dpt/cxphys11040.htm http://www.drps.ed.ac.uk/19-20/dpt/cxphys11064.htm
UCL	Physics with Medical physics (BSc and MSCi) Introduction to Medical Imaging (Year 1 compulsory) https://www.ucl.ac.uk/medical-physics-biomedical-engineering/mphy0001-introduction-medical-imaging :	https://www.ucl.ac.uk/medical-physics-biomedical-engineering/study/undergraduate

	The basic physical and engineering principles behind major medical imaging techniques will be described, and their relative advantages and disadvantages will be explored. The capabilities of the imaging techniques will be explained in terms of performance criteria such as spatial and temporal resolution, contrast, and signal-to-noise-ratio. The effectiveness of the methods will be illustrated in terms of their clinical applications. An historical perspective of the development of each technique will be presented, as well as the latest innovations. Finally, potentially new and emerging medical imaging technqiues will be considered. Introduction to Biophysics (Year 2 compulsory): Physics of the Human Body (Year 2 compulsory): Medical Physics Project (Final year compulsory project): 3 options out of the 8 following (years 3-4): • Applications of Biomedical Engineering • Computing in Medicine • Medical Electronics and Neural Engineering • Medical Imaging with Ionising Radiation • MRI and Biomedical Optics • Physiological Monitoring • Treatment with Ionising Radiation • Biomedical Ultrasound Additional options for year 4: • Computer Assisted Surgery and Therapy • Information Processing for Medical Imaging	
Manchester	MSc/PGDip/PGCert Cancer Biology and Radiotherapy Physics (up to 3 years, need a 2:1 in biology and physics) MPhys Physics	https://www.manchester.ac.uk/study/masters/courses/list/11833/msc-pgdip-pgcert-cancer-biology-and-radiotherapy-physics/

	Physics of Medical Imaging (Year 3 and 4): 1. Describe the process of image acquisition and reconstruction for a range of medical imaging modalities 2. Relate the properties of medical images to the underlying physical processes 3. Predict the effect of a change in acquisition parameters and conditions on the appearance of the reconstructed image 4. Design image acquisition strategies and calculate relevant parameters to achieve a specified outcome 5. Compare the advantages and disadvantages of different medical imaging modalities and their configuration for a particular clinical application	https://www.manchester.ac.uk/study/undergraduate/courses/2020/02021/mphys-physics/course-details/PHYS30632#course-unit-details
	Applied Nuclear Physics (Years 3 and 4): 1. Summarise the aspects of nuclear physics which are most relevant to current applications. 2. Derive the key relationships describing nuclear behaviour and properties of radiation which are exploited in areas of application from fundamental concepts and nuclear properties. 3. Demonstrate, by example, how the principles and concepts of physics and nuclear physics are exploited in areas of technology, energy, environment and health. 4. Calculate solutions to basic problems involving the application of the concepts of physics and nuclear physics in the practical situations covered in the course unit	https://www.manchester.ac.uk/study/undergraduate/courses/2020/02021/mphys-physics/course-details/PHYS40422#course-unit-details
	Laser Photomedicine (Year 4): 1. Classify and describe the mechanisms associated with the interaction of light with tissue; 2. Explain the relevant properties of lasers and light delivery systems for applications in medicine;	https://www.manchester.ac.uk/study/undergraduate/courses/2020/02021/mphys-physics/course-details/PHYS40631#course-unit-details

	3. Compare imaging, optical diagnostic and therapeutic applications in medicine and predict which are most appropriate for applications; 4. Discuss selected applications of lasers and optical techniques which are presently important in medicine Biomaterials/Biophysics (Year 4): 1. describe the range of structures of biomolecules and their functionality in living systems. 2. explain the key relationships between the structures and properties of nanomaterials. 3. describe a few typical methods of production of nanomaterials. 4. describe quantum effects on the physical and chemical properties of materials at nanoscales; their potential applications in daily life; and their potential risks. 5. discuss the medical requirements for these advanced materials. 6. describe selected applications of nanomaterials and nanotechnology in the area of diagnostics, therapies and drug delivery. 7. explain the principles of a range of advanced experimental techniques used in determination of the structure and dynamical properties of biomaterials. MSc/PGDip Medical Imaging Science (1 or 2 years): • a systematic understanding of the scientific basis of the major medical imaging modalities; • a broad understanding of the principal clinical applications of medical imaging and its role in diagnosis, monitoring and therapy; • an understanding of the capabilities and limitations of medical imaging for deriving quantitative anatomical and physiological data; • knowledge of how advanced imaging techniques are applied in medical research and drug discovery; • the experience to plan, implement and complete a research project; • generic transferrable skills required in a multidisciplinary scientific or clinical research environment; • the knowledge and skills required for a career in an imaging-related field in clinical practice, medical research, and scientific research or technological development.	https://www.manchester.ac.uk/study/undergraduate/courses/2020/02021/mphys-physics/course-details/PHYS40732#course-unit-details https://www.manchester.ac.uk/study/masters/courses/list/10263/msc-pgdip-medical-imaging-science/

	Radioisotope Imaging (Compulsory) Advanced MT imaging (Compulsory) Non-Radioisotope imaging (Compulsory) Advanced Positron Emission Tomography Imaging (Compulsory) Mathematical Foundations Of Imaging (Compulsory) Scientific skills Medical Image Analysis and Mathematical Computing (Optional) Imaging in Clinical Diagnosis (Optional)	https://www.manchester.ac.uk/study/masters/courses/list/10263/msc-pgdip-medical-imaging-science/course-details/IIDS67401#course-unit-details https://www.manchester.ac.uk/study/masters/courses/list/10263/msc-pgdip-medical-imaging-science/course-details/IIDS67422#course-unit-details https://www.manchester.ac.uk/study/masters/courses/list/10263/msc-pgdip-medical-imaging-science/course-details/IIDS67431#course-unit-details https://www.manchester.ac.uk/study/masters/courses/list/10263/msc-pgdip-medical-imaging-science/course-details/IIDS67432#course-unit-details https://www.manchester.ac.uk/study/masters/courses/list/10263/msc-pgdip-medical-imaging-science/course-details/IIDS67451#course-unit-details https://www.manchester.ac.uk/study/masters/courses/list/10263/msc-pgdip-medical-imaging-science/course-details/IIDS67441#course-unit-details https://www.manchester.ac.uk/study/masters/courses/list/10263/msc-pgdip-medical-imaging-science/course-details/IIDS67462#course-unit-details https://www.manchester.ac.uk/study/masters/courses/list/10263/msc-pgdip-medical-imaging-science/course-details/IIDS67472#course-unit-details

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St-Andrews	Data Processing for Biomedical Imaging and Sensing (SCQF Level 10) The module teaches the physics and data treatment involved in different medical imaging modalities. The students will be able to implement numerical methods necessary to simulate and/or treat data related to medical imaging and sensing.	https://portal.st-andrews.ac.uk/catalogue/View?code=PH4045&academic_year=2019/0
	Soft Matter and Biophysics (SCQF level 11 Available only to students on the Photonics and Optoelectronic Devices MSc programme)	https://portal.st-andrews.ac.uk/catalogue/View?code=PH5190&academic_year=2019/0
	Monte Carlo Radiation Transport Techniques (SCQF level 11, Normally only taken in the final year of an MPhys or MSci programme involving the School, or as part of MSc Astrophysics) utron transport. • Use random numbers to sample events and processes from probability distribution functions • Understand and the structure of Monte Carlo radiation transfer codes for photon scattering and absorption • Understand the structure of Monte Carlo codes for neutron transport including absorption, scattering, and fission • Understand the concept of Monte Carlo detectors and estimators to determine physical quantities throughout a medium such as photon flux, fluence, radiation pressure • Understand variance reduction techniques to improve signal-to-noise in Monte Carlo simulations; forced first scattering, weighting techniques, Russian roulette, next-event estimators • Understand the structure of Monte Carlo codes for photon and neutron transport in three dimensional density structures • Understand the structure of Monte Carlo codes for neutron criticality calculations • Understand the important physical processes required for Monte Carlo simulations of light interacting with biological tissue, photobleaching, and photodynamic therapy • Be able to write Fortran programs and subroutines to sample from probability distribution functions, both analytic and tabulated	https://portal.st-andrews.ac.uk/catalogue/View?code=PH5023&academic_year=2019/0

	• Be able to write Monte Carlo codes to simulate the transport of photons and neutrons in uniform density structures • Be able to adapt and modify a publicly available three dimensional Monte Carlo code for specific problems in photon transport	
Durham	Biology and Physics (BSc and MSci) Biophysical Research Project (Year 4) BioPhysics and Soft Matter	https://www.dur.ac.uk/courses/info/?id= 11745&title=Natural+Sciences&code=FGC0&type=MSCI&year=2019#coursecontent https://www.dur.ac.uk/cmp/lectures/biophysics/

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Birmingham	Physics (BSc and MSci) Medical Imaging (Year 3 option) Radiation Physics (Postgraduate) Physics and Technology of Nuclear Reactors Masters (MSc) Including Nuclear Instrumentation, Radiation Dosimetry and Protection	https://www.birmingham.ac.uk/undergraduate/courses/physics/physics-bsc.aspx https://www.birmingham.ac.uk/postgraduate/courses/taught/med/pg-modules/radiation-physics.aspx https://www.birmingham.ac.uk/postgraduate/courses/taught/physics/physics-technology-nuclear-reactors.aspx#CourseDetailsTab