MRes Bioimaging Sciences

This document provides a definitive record of the main features of the programme and the learning outcomes that a typical student may reasonably be expected to achieve and demonstrate if s/he takes full advantage of the learning opportunities provided. This programme specification is intended as a reference point for prospective students, current students, external examiners and academic and support staff involved in delivering the programme and enabling student development and achievement.

Programme Information				
Programme Title	Bioimaging Sciences			
Award(s)	MRes			
Programme Code	F1U6			
Awarding Institution	Imperial College London			
Teaching Institution	Imperial College London			
Faculty	Faculty of Natural Sciences			
Department	Department of Chemistry			
Main Location of Study	South Kensington and White City Campuses			
Mode and Period of Study	1 academic year, full-time			
Cohort Entry Points	Annually in October			
Relevant QAA Benchmark Statement(s) and/or other external reference points	Master's Degrees in Chemistry			
Total Credits	ECTS:	90	CATS:	180
FHEQ Level	Level 7 – Master's			
EHEA Level	2nd cycle			
External Accreditor(s)	None			
Specification Details				
Student cohorts covered by specification	2020-21 entry			
Person(s) responsible for the specification	Dr Philip Miller, Course Director			
Date of introduction of programme	October 2005			
Date of programme specification/revision	July 2020			
Programme Overview				

Bioimaging sciences have played a vital role in improving human life by underpinning modern medical imaging techniques that enable more accurate diagnosis and staging of illnesses. A wide range of imaging techniques, such as magnetic resonance imaging (MRI), positron emission tomography (PET), Single Photon Emission Computed Tomography (SPECT), ultrasound and optical imaging, are now important tools for the early detection of disease, understanding basic molecular aspects of living organisms and the evaluation of medical treatment.

This one-year MRes course covers the fundamentals of modern imaging methodologies, including their techniques and application within medicine and the pharmaceutical industry, along with the chemistry behind imaging agents and biomarkers.

Imperial College is a world leading and internationally recognised research institution in imaging sciences, as exemplified by the creation of Imperial's Imaging Sciences Centre (ISC) and a joint Imperial College-King's College Centre for Doctoral Training (CDT) in medical imaging.

The course will progress interdisciplinary development in imaging sciences and create a multidisciplinary team involving chemists, immunologists, radiologists, image scientists, physicists, biomedical scientists and computer scientists.

Graduates of this programme can expect to have all the necessary skills and experience to apply cutting edge approaches in either commercial or academic laboratories, the research project in particular equipping them admirably for PhD studies.

Learning Outcomes

The Imperial Graduate Attributes are a set of core competencies which we expect students to achieve through completion of any Imperial College degree programme. The Graduate Attributes are available at: www.imperial.ac.uk/students/academic-support/graduate-attributes

The main outcome of the programme is to provide opportunities for postgraduate students to develop and demonstrate knowledge and understanding, qualities, skills and other attributes.

The programme aims to:

- Produce physical sciences postgraduates equipped to pursue careers at the interface between the physical and life sciences (imaging related areas), in industry, the public sector and non-governmental organisations;
- Develop the ability to undertake research in multidisciplinary teams at this interface;
- Develop a knowledge of a range of basic and advanced bioimaging concepts;
- Develop research and analytical skills related to bioimaging research;
- Develop oral and written scientific presentation skills;
- Attract the most motivated physical sciences graduates, both from within the UK and from overseas;
- Develop new areas of teaching in response to the advance of scholarship and the needs of vocational training.

Considering the above aims, the main outcome of the programme is to provide opportunities for postgraduate student

Knowledge and Understanding:

- Core and specialised concepts in imaging science – positron emission tomography (PET), single photon emission tomography (SPECT), magnetic resonance imaging (MRI), optical imaging (Bioluminescence, FLIM), ultrasound, pharmacology, anatomy-physiology, image computation, the chemistry of imaging;
- Research techniques, including information retrieval, experimental design and statistics, modelling, sampling, bioimaging techniques, molecular characterisation, and laboratory safety;
- Detailed knowledge and understanding of the essential facts, concepts, principles and theories relevant to the student's project;

- Management and communication skills, including problem definition, project design, decision processes, teamwork, written and oral reports, scientific publications.

Intellectual Skills - able to:

- Analyse and solve bioimaging problems using an integrated multidisciplinary approach;
- Integrate and evaluate information;
- Formulate and test hypotheses;
- Plan, conduct and write-up a programme of original research.

Practical Skills - able to:

- Plan and execute safely a series of experiments or computations;
- Use laboratory methods or computer-based tools to generate data;
- Analyse results, determine their strength and validity, and make recommendations;
- Prepare technical reports;
- Give technical presentations;
- Use the scientific literature effectively.

Transferable Skills - able to:

- Communicate effectively through oral presentations, computer processing and presentations, and written reports;
- Apply knowledge and modelling skills;
- Management skills: decision processes, objective criteria, problem definition, project design and evaluation needs;
- Integrate and evaluate information from a variety of sources;
- Transfer techniques and solutions from one discipline to another;
- Use Information and Communications Technology;
- Manage resources and time;
- Learn independently with open-mindedness and critical enquiry;
- Learn effectively for the purpose of continuing professional development.

Entry Requirements	
Academic Requirement	Normally a 2.1 UK Bachelor's Degree with Honours in a science, technology, engineering or medicine subject (or a comparable qualification recognised by the College).
English Language Requirement	Standard requirement IELTS score of 6.5 overall (minimum 6.0 in all elements)
The programme's competency standards document can be found at: http://www.imperial.ac.uk/chemistry/postgraduate/mres-courses/	
Learning & Teaching Strategy	
Scheduled Learning & Teaching Methods	• Lectures • Seminars • Online webinars

	• Journal club • Practicals
Project Learning Methods	• Individual research project
Assessment Strategy	
Assessment Methods	• Written examinations • Project • Coursework • Literature report • Group work • Reports • Presentations • Practicals
Academic Feedback Policy	
Feedback will be provided within 2 weeks for small pieces of coursework (journal clubs, poster project) and within 3 weeks for larger assessments (research proposal, bespoke courses). For lectures courses attended alongside final year UG (MSci) students, feedback will be provided at the same time as for the MSci students. In all cases, the MRes students will be provided with information on when they can expect the feedback to be provided. If there is any delay, the students will be informed.	
Re-sit Policy	
The College's Policy on Re-sits is available at: www.imperial.ac.uk/registry/exams/resit	
Mitigating Circumstances Policy	
Students may be eligible to apply for mitigation if they have suffered from serious and unforeseen circumstances during the course of their studies that have adversely affected their ability to complete an assessment task and/or their performance in a piece of assessment. The College's Policy on Mitigating Circumstances is available at: http://www.imperial.ac.uk/student-records-and-data/for-current-students/undergraduate-and-taught-postgraduate/exams-assessments-and-regulations/	
Assessment Dates & Deadlines	
Written Examinations	Spring Term
Coursework Assessments	Autumn/ Spring Term
Project Deadlines	Summer Term

Practical Assessments	Autumn Term
Assessment Structure	
Marking Scheme	

Pass: to be awarded where a candidate has achieved:

- Achieve an aggregate mark of at least 50% in each module
- Achieve a mark of at least 50% in the individual project
- Achieve an aggregate mark of at least 50% for the programme as a whole

Merit: to be awarded where a candidate has achieved:

- Achieve an aggregate mark of at least 60% in each module
- Achieve a mark of at least 60% in the individual project
- Achieve an aggregate mark of at least 60% for the programme as a whole. A student who fails to meet this requirement may be Compensated. Compensation is awarded at the discretion of the Board of Examiners and only in accordance with paragraph 14.2 of the Regulations for the Examination of Master's Level Degrees.

Distinction: to be awarded where a candidate has achieved:

- Achieve an aggregate mark of at least 70% in each module
- Achieve a mark of at least 70% in the individual project
- Achieve an aggregate mark of at least 70% for the programme as a whole. A student who fails to meet this requirement may be Compensated. Compensation is awarded at the discretion of the Board of Examiners and only in accordance with paragraph 14.2 of the Regulations for the Examination of Master's Level Degrees.

Module Weightings		
Module	Components	% Module Weighting
Taught	Lecture Courses – Written Exam (20%), Optical Imaging – Biomedical Optics Essay (5%), Practical (5%), Journal Club (5%)	35%
Research	Literature Review (10%), MRes Manuscript (40%), Oral Exam (10%), MRes conference Presentation (5%).	65%

Indicative Module List											
Code	Title	Core/ Elective	L&T Hours	Ind. Study Hours	Place-ment Hours	Total Hours	% Written Exam	% Course-work	% Practical	FHEQ Level	ECTS
	Taught module (includes; Taught Lecture Courses, Optical Imaging – Biomedical Optics Essay, Taught Practical – Magnetic Nanoparticles & Radiochemistry & Journal Club)	CORE	92	283	0	375	43%	57%	0%	7	15
	Research Module (includes Literature Report, MRes Manuscript, Oral Viva and MRes Conference Presentation)	CORE	0	1875	0	1875	0%	100%	0%	7	75

Supporting Information
The Programme Handbook is available at: https://www.imperial.ac.uk/study/pg/chemistry/bioimaging-sciences/
The Module Handbook is available at: https://www.imperial.ac.uk/study/pg/chemistry/bioimaging-sciences/
The College's entry requirements for postgraduate programmes can be found at: www.imperial.ac.uk/study/pg/apply/requirements
The College's Quality & Enhancement Framework is available at: www.imperial.ac.uk/registry/proceduresandregulations/qualityassurance
The College's Academic and Examination Regulations can be found at: https://www.imperial.ac.uk/about/governance/academic-governance/regulations
Imperial College is an independent corporation whose legal status derives from a Royal Charter granted under Letters Patent in 1907. In 2007 a Supplemental Charter and Statutes was granted by HM Queen Elizabeth II. This Supplemental Charter, which came into force on the date of the College's Centenary, 8th July 2007, established the College as a University with the name and style of "The Imperial College of Science, Technology and Medicine". http://www.imperial.ac.uk/admin-services/secretariat/college-governance/charters/charter-and-statutes/
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