Imperial College London

Programme Specification (Master's Level)

MRes Medical Device Design and Entrepreneurship

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	Medical Device Design and Entrepreneurship
Award(s)	MRes
Programme Code	H673U
Awarding Institution	Imperial College London
Teaching Institution	Imperial College London
Faculty	Faculty of Engineering
Department	Department of Bioengineering
Associateship	City and Guilds of London Institute
Main Location of Study	South Kensington and White City Campuses
Mode and Period of Study	1 calendar year, full-time
Cohort Entry Points	Annually in October
Relevant QAA Benchmark Statement(s) and/or other external reference points	Master's Degree in Engineering Master's Degree in Biosciences

Total Credits	ECTS:	90	CATS:	180

FHEQ Level	Level 7
EHEA Level	2nd cycle
External Accreditor(s)	Institute of Physics and Engineering in Medicine Institution of Mechanical Engineers Institute of Materials, Minerals & Mining Institution of Engineering Designers

Specification Details

Student cohorts covered by specification	2020/21 entry
Person responsible for the specification	Professor Emm Drakakis, Director of Courses

Date of introduction of programme	2013
Date of programme specification/revision	Sept 2020

Programme Overview

This programme is offered as a one-year full-time programme consisting of a number of elements leading to the MRes degree – these include lectures, practicals and a major research project focussed on a medical device concept.

In the first term, students will begin the programme with compulsory core modules and practical work.

In the first term students also make their choice on the medical device concept which will be the subject of their research/development project, and begin working on a market analysis and development plan. The research project would usually be supervised by Professor Moore and there would usually be a second supervisor from industry. Industry participation enhances the quality of the educational experience by providing additional input on the complex pathway encountered in pushing a medical device toward the marketplace. Industry participants have a technical background and are currently working in medical device development or business funding.

During term 2 and 3 students study some other taught modules and attend workshops. Throughout the year, students also attend Departmental seminars throughout the year, as well as the Department of Bioengineering PhD Assessment days, which are structured as mini-symposia.

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

Knowledge and Understanding of:
1. Core and specialised concepts in bioengineering entrepreneurship;
2. Business strategy planning expertise specific to medical device development;
3. Detailed knowledge and understanding of the essential facts, concepts, principles and theories relevant to the medical device that is the subject of their research/development project;
4. Management and communication skills, including problem definition, project design, decision processes, teamwork, written and oral reports, proposals and publications.

Intellectual Skills:
1. Analyse and solve problems in bioengineering using an integrated multidisciplinary approach;
2. Integrate and evaluate information;
3. Formulate an engineering-based development path for a medical device;
4. Plan, conduct, present and write-up a business plan for a medical device.

Practical Skills:
1. Use engineering analysis tools to evaluate the feasibility and likely success of a medical device concept;

2. Use laboratory methods or computer-based tools to generate data;
3. Analyse results, determine their strength and validity, and make recommendations;
4. Prepare technical and business reports;
5. Give technical and business presentations;
6. Use the literature effectively.

Professional Skills Development:
1. Communicate effectively across different scientific and business disciplines through oral presentations and written reports;
2. Apply knowledge, experimental, and modelling skills;
3. Management skills: decision processes, objective criteria, problem definition, project design and evaluation needs;
4. Integrate and evaluate information from a variety of sources;
5. Transfer techniques and solutions from one discipline to another;
6. Use Information and Communications Technology;
7. Manage resources and time;
8. Learn independently with open-mindedness and critical enquiry;
9. Learn effectively for the purpose of continuing professional development.

Entry Requirements	
Academic Requirement	The minimum requirement is normally an upper second class (2:1) UK Bachelor's Degree with Honours in a Physical, Engineering, Mathematical, or Life/Biomedical Sciences-based subject from an UK academic institution or a comparable qualification recognised by the College
Non-academic Requirements	None

Applicants may be invited to attend an interview with one or more members of academic staff.

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/bioengineering/admin/msc/essential-information/

Learning & Teaching Strategy	
Scheduled Learning & Teaching Methods	• Demonstrations • Group exercises • Guided practical classes • Laboratory work • Lectures • Individual research project • Presentations • Seminars • Workshops

E-learning & Blended Learning Methods	- Virtual Learning Environment: Blackboard - Online groups/discussions - Online quizzes and interactive content - You tube videos - Anonymous feedback - Lectures recorded using Panopto
Project and Placement Learning Methods	Group and individual project work

Assessment Strategy

Assessment Methods	- Written examinations - Oral presentations - Coursework including multiple choice progression test, problem sheets and quizzes - Written reports, including a research thesis

Academic Feedback Policy

Feedback may be provided in one of a number of formats, including:

- Oral (during or after lectures)
- Personal (discussion with academics during office hours)
- Interactive (problem solving tutorials with GTAs & study groups)
- Written (solutions/model answers to coursework)

Individual feedback will not be provided on written examinations.

Numerical results will be published after the meeting of the final Board of Examiners.

Re-sit Policy

Eligibility for resits is determined by the Examination Board in line with the College policy. The Department of Bioengineering does not normally offer resits in September. Students with marginal failure may be offered a supplementary qualifying test in place of a re-sit opportunity. The College's Policy on Re-sits is available at: www.imperial.ac.uk/registry/exams/resit

Mitigating Circumstances Policy

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 Structure
Marking Scheme

There are two elements – taught element, and project element.

In order to pass the MRes, a student must:

- Achieve an aggregate of at least 50% in each element
- Pass each module at 50%. *At the discretion of the Exam Board, up to 15 ECTS worth of modules having marks below 50% may be awarded a compensated pass as long as their respective element mark is 50% or greater.*

In order to gain a Merit classification, a student must achieve an aggregate of at least 60% in each element

In order to gain a Distinction classification, a student must achieve an aggregate of at least 70% in each element.

Module Weightings		
Element	Module	% Module Weighting (in element)
Taught Element (22%)	Medical Device Entrepreneurship	50%
	Computational and Statistical Methods for Research	50%
	Topics in Biomedical Engineering and Business	0%
Research Element (78%)	Marketing analysis and development	13.3r%
	Elevator pitch	13.3r %
	Written research / development project	60%
	Oral viva	13.3r %

Indicative Module List											
Code	Title	Core/ Elective	L&T Hours	Ind. Study Hours	Place- ment Hours	Total Hours	% Writte n Exam	% Course- work	% Practica l	FHE Q Level	ECTS
BIOE97042 (BE9-MDEVEN)	Medical Device Entrepreneurship	CORE	27	157.5	0	187.5	0%	100%	0%	7	7.5
BIOE97142 (BE9-MCSMR)	Computational and Statistical Methods for Research	CORE	27	98	0	125	35%	50%	15%	7	5
BIOE97145 (BE9-MRNCM)	Topics in Biomedical Engineering and Business	CORE	108	79.5	0	187.5	0%	100%	0%	7	7.5
BIOE97107	Medical Device Design and Entrepreneurship Research Project	CORE	41	1634	0	1675	0%	73%	27%	7	70

Supporting Information
The Programme Handbook is available at: http://www.imperial.ac.uk/bioengineering/study/postgraduate-research/mrs-med-device-design/
The Module Handbook is available at: http://www.imperial.ac.uk/bioengineering/admin/current-pgt/options/b9a1/
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: http://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/
Imperial College London is regulated by the Office for Students (OfS) https://www.officeforstudents.org.uk/