

MRes Bioengineering

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	Bioengineering		
Award(s)	MRes		
Programme Code	H673T		
Awarding Institution	Imperial College London		
Teaching Institution	Imperial College London		
Faculty	Faculty of Engineering		
Department	Department of Bioengineering		
Main Location of Study	South Kensington and White City Campuses		
Associateship	City and Guilds of London Institute		
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	2 nd cycle		
External Accrator(s)	None		
Specification Details			
Student cohorts covered by specification	2019/20 entry		
Person responsible for the specification	Professor Martyn Boutelle, Director of Courses		
Date of introduction of programme	2012		
Date of programme specification/revision	February 2019		

Programme Overview

Bioengineering is at the interface of engineering and medicine. Bioengineering is a discipline that advances knowledge in engineering, biology and medicine, and improves human health through cross-disciplinary activities that integrate the engineering sciences with the biomedical sciences and clinical practice.

The MRes Bioengineering is a one year full-time programme leading to the MRes award. Students of the programme will benefit from interaction with students on other programmes on the Department to develop their interdisciplinary knowledge.

The programme involves lectures and practical work in the first term, followed by full-time work on a research project. A variety of seminars and workshops are provided to deepen and broaden the students' research skill-base. The programme will prepare students to analyse and solve problems in bioengineering using an integrated, multidisciplinary approach.

Usually the MRes research project would be supervised by at least two supervisors with different expertise. Supervisors may be drawn from any department across the College. Some students may also have a co-supervisor from industry.

Students have the opportunity to take additional modules and short workshops in the 2nd and 3rd terms and will attend seminars and journal clubs throughout the year, as well 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:

- Core and specialised concepts in bioengineering research.
- Research techniques, including information retrieval, experimental design and statistics, computer modelling, sampling, experimental techniques, engineering design, problem solving, 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 proposals and publications.

Intellectual Skills:

- Analyse and solve problems in bioengineering using an integrated multidisciplinary approach;
- Integrate and evaluate information;
- Formulate and test hypotheses using appropriate design of models or experiments, as well as statistical analysis of data;
- Plan, conduct and write-up a programme of original research.

Practical Skills:

- 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:

- Communicate effectively across different scientific disciplines through oral presentations, computer processing and presentations, and written reports;
- Apply knowledge, experimental, 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	The minimum requirement is normally a 2:1 UK Bachelor's Degree with Honours in a physical science, engineering, mathematical, life/biomedical sciences based subject 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	<ul style="list-style-type: none"> • Demonstrations • Group exercises • Guided practical classes • Laboratory work • Lectures • Individual research project • Presentations • Seminars • Workshops
E-learning & Blended Learning Methods	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Group and individual project work

Assessment Strategy

Assessment Methods	<ul style="list-style-type: none"> • Written examinations • Oral presentations
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	<ul style="list-style-type: none"> • Coursework including multiple choice progression test, problem sheets and quizzes • Written reports, including a research thesis
<p>Academic Feedback Policy</p>	
<p>Feedback may be provided in one of a number of formats, including:</p> <ul style="list-style-type: none"> • 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) <p>Individual feedback will not be provided on written examinations.</p> <p>Numerical results will be published after the meeting of the final Board of Examiners.</p>	
<p>Re-sit Policy</p>	
<p>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</p>	
<p>Mitigating Circumstances Policy</p>	
<p>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/</p>	

Assessment Structure

Marking Scheme

The Pass Mark for all postgraduate taught course modules is 50%. Students must pass all elements in order to be awarded a degree.

1. Minimum standards (i.e. 50%) in each of the three assessed elements (coursework, written thesis and research presentation) will be required with an overall pass mark of 50%. To achieve pass with distinction a minimum of 70% is required in each of the elements. To achieve a pass with merit a minimum of 60% is required in each of the elements.
2. To qualify for the award of MRes, students must complete all the course requirements, including the participation in mandatory extra curriculum events, and must achieve an overall pass mark in the combined examinations.
3. Students will be given a mark for both assessed element, plus an overall mark which is used to decide whether a Merit or Distinction is awarded. For this overall mark, the weighting of the individual marks is 17% for the taught element (8.5% Computational and Statistical Methods for Research and 8.5% for Frontiers in Bioengineering Research), and 83% for the research element (13.3% for the literature review & thesis proposal, 13.3% for the poster presentation, 60% for the thesis and 13.3% for the oral viva). The two independent viva examiners provide internal marks for the oral exam (about 45min) and the research report. Both viva examiners will finally provide an agreed mark. The final mark for the research project, conduct, and viva is the average of the marks from the supervisors and the agreed mark from the viva examiners. The external examiners will moderate the final mark if necessary.

The pass mark for all Master's level modules is 50%. Students must pass all elements in order to be awarded a degree. If any module score is less than 50% it must be compensated by other modules in the same element. However if any module score is less than 40% it is deemed to be failed and the Board of Examiners at their discretion will decide whether the student can be deemed to have passed the MRes overall.

Module Weightings

Element	Module	% Module Weighting (in element)
Taught element (17%)	Computational and Statistical Methods for Research	50%
	Frontiers in Bioengineering Research	50%
	Topics in Biomedical Engineering	0%
Research element (83%)	Literature review and thesis proposal	13%
	Poster presentation	13%
	Thesis	61%
	Oral exam	13%

Indicative Module List											
Code	Title	Core/ Elective	L&T Hours	Ind. Study Hours	Place- ment Hours	Total Hours	% Written Exam	% Course- work	% Practical	FHE Q Level	ECT S
BE9-MCSMR	Computational and Statistical Methods for Research	CORE	27	98	0	125	100%	0%	0%	7	5
BE9-MTBME	Topics in Biomedical Engineering	CORE	27	98	0	125	0%	100%	0%	7	5
BE9-MFBR	Frontiers in Bioengineering Research	CORE	54	71	0	125	0%	100%	0%	7	5
	Research Project	CORE	41	1659	0	1700	0%	73%	27%	7	75

Supporting Information

The Programme Handbook is available at:

<http://www.imperial.ac.uk/bioengineering/admin/research/mres/>

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/>

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