MRes Neurotechnology

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	Neurotechnology
Award(s)	MRes
Programme Code	H6NU
Associateship	City and Guilds of London Institute
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
Mode and Period of Study	1 calendar year (12 months), 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	October 2016
Date of programme specification/revision	Sept 2020

Programme Overview

Neurotechnology is the use of insights and tools from mathematics, physics, chemistry, biology and engineering to investigate neural function and treat dysfunction. Brain-related illnesses affect more than two billion people worldwide, and the numbers are growing. Reducing this burden is a major challenge for society.

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

Candidates make their choice of research project prior to beginning the programme. The programme involves lectures and practical work in the first term, followed by full-time work on a research project which will involve laboratory rotations (as part of a single project), with a single thesis submission at the end of the MRes year. The research project would normally be supervised by at least two supervisors with different expertise, with the lead supervisor based in Bioengineering. Co-supervisors may be drawn from any department across the College. Some students may also have a co-supervisor from industry.

A variety of seminars and workshops is provided to deepen and broaden the students' research skill-base. The programme will prepare students to analyse and solve problems in neurotechnology using an integrated, multidisciplinary approach.

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 neurotechnology 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 neurotechnology 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 (or a comparable qualification recognised by the College) in a physical science or engineering subject. Students with a biological or medical sciences background may be considered if they can demonstrate substantial quantitative skills.
Non-academic Requirements	None

Applicants will 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 research 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
Taught Element (22%)	Neuroscience	33.3r%
	Computational and Statistical Methods for Research	33.3r%
	Frontiers in Neurotechnology Research	33.3r%
	Topics in Neural Engineering	0%
Research Element (78%)	Planning report	13%
	Poster presentation	13%
	Thesis	61%
	Oral presentation	13%

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
BIO97048 (BE9-MINS)	Neuroscience	CORE	27	98	0	125	100%	0%	0%	7	5
BIOE97142 (BE9-MCSMR)	Computational and Statistical Methods for Research	CORE	27	98	0	125	35%	50%	15%	7	5
BIOE79143 (BE9-MTNE)	Topics in Neural Engineering	CORE	27	98	0	125	0%	100%	0%	7	5
BIOE97147 (BE9-MFNR)	Frontiers in Neurotechnology Research	CORE	54	71	0	125	0%	100%	0%	7	5
BIOE97106	Neurotechnology Research Project	CORE	41	1659	0	1750	0%	70%	30%	7	70

Supporting Information
The Programme Handbook is available at: http://www.imperial.ac.uk/neurotechnology/cdt/training/mres/
The Module Handbook is available at: http://www.imperial.ac.uk/neurotechnology/cdt/training/mres/
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://www3.imperial.ac.uk/registry/proceduresandregulations/regulations
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