Programme Information		
Programme Title	Programme Code	HECoS Code
Cancer Technology	A3CT	For Registry Use Only

Award	Length of Study	Mode of Study	Entry Point(s)	Total Credits	
				ECTS	CATS
MRes	1 Calendar Year (12 months)	Full time	Annually in October	90	180
PG Diploma – A3CTD	N/A	N/A	N/A	60	120
PG Certificate – A3CTC	N/A	N/A	N/A	30	60
The PG Certificate and PG Diploma are exit awards and are not available for entry. You must apply to and join the MRes. The PG Certificate and PG Diploma are not accredited by any professional body.					

Ownership			
Awarding Institution	Imperial College London	Faculty	Faculty of Engineering
Teaching Institution	Imperial College London	Department	Bioengineering
Associateship	Diploma of Imperial College (DIC)	Main Location(s) of Study	South Kensington and White City Campuses
External Reference			
Relevant QAA Benchmark Statement(s) and/or other external reference points		Master's Award in Engineering	
FHEQ Level		Level 7 - Masters	
EHEA Level		2nd Cycle	
External Accreditor(s) (if applicable)			
External Accreditor 1:	The Institution of Engineering Designers		
Accreditation received:	2024	Accreditation renewal:	2029
External Accreditor 2:	The Institute of Materials, Minerals and Mining		
Accreditation received:	2024	Accreditation renewal:	2029
External Accreditor 3:	The Institution of Engineering and Technology		
Accreditation received:	2024	Accreditation renewal:	2026

External Accreditor 4:	Institution of Mechanical Engineers		
Accreditation received:	Pending	Accreditation renewal:	Pending
Collaborative Provision			
Collaborative partner	Collaboration type	Agreement effective date	Agreement expiry date
Institute of Cancer Research	Cross-Disciplinary Teaching at Imperial South Kensington	3 October 2020	N/A

Specification Details	
Programme Lead	Dr Jun Ishihara
Student cohorts covered by specification	2025-26 entry
Date of introduction of programme	October 20
Date of programme specification/revision	March 25

Programme Overview

The MRes in Cancer Technology programme provides an immersive environment where you will develop a unique understanding of cancer from an engineering perspective in addition to state-of-the-art in technologies used to understand, treat, and diagnose this disease. You will also gain useful skills in engineering, research and statistical analyses before embarking on a comprehensive, 9-month research project. Both the taught and research elements of this degree programme are multi-disciplinary. We bring in lecturers from across Imperial and Institute of Cancer Research; and place each student on a multi-disciplinary research project jointly supervised by academics with engineering/technological and biological/clinical expertise.

You are welcome to contact the programme director before applying for the program to discuss suitability and project selection. You will have an opportunity to discuss with supervisors about potential projects in the Autumn term and will choose projects before the start of the Spring term. It may be possible for projects to be carried out partly or wholly at an external organisation and requests will be considered on a case by case basis.For examples of current projects please see the department webpages.

The programme is delivered by the Department of Bioengineering and is based at the South Kensington and White City Campuses. However, the research project can be conducted in any laboratory based in the Faculty of Engineering, Faculty of Natural Sciences, Faculty of Medicine, and the Institute of Cancer Research. The programme builds on the Department's strength in bioengineering technologies for cancer, and the collaboration between the university and other leading cancer organisations such as the Institute of Cancer Research.

The programme is the first of its kind in the UK and equips you for on-demand research careers in academia and industry within the growing field of engineering and technology in cancer. You will be particularly well equipped for cross-disciplinary PhD programs such as the Convergent Science PhD Programme run jointly between Imperial College London and the Institute of Cancer Research. This training will be facilitated by cross-disciplinary interactions between leading engineers, life scientists, medics, and clinicians.

Learning Outcomes

The following Learning Outcomes are in line with FHEQ level 7 and the UK-SPEC outcomes required for accreditation by professional engineering bodies.

The Learning Outcomes are categorised into the following groups:

- Knowledge and Understanding [KU]

- Intellectual Abilities [IA]
- Practical and Transferable skills [PT]

Upon successful completion of the MRes Cancer Technology programme you will be able to:

[KU1] Assess the underlying scientific principles and models that govern cancer progression and current challenges in cancer management.

[**KU2]** Evaluate the core concepts, principles and theories relevant to *Cancer Technology* and how these are relevant to historical, current and future developments and technologies in the *Cancer Technology* field.

[KU3] Evaluate a wide range of scientific studies in the Cancer technology field and critically discuss these examples in terms of their commercial, economic, social and sustainability implications.

[IA1] Critically select and apply engineering principles and tools for the analysis and solution of familiar and unfamiliar problems in the field of cancer research, including investigation of new and emerging technologies.

[IA2] Apply technical knowledge and understanding of engineering design processes to analyse, evaluate and refine experimental processes for applications to cancer biology and oncology.

[IA3] Extract, analyse and critically evaluate information and data gathered from experimentation, academic and technical resources to determine their strength and validity, interpret conclusions and make recommendations for future experimental studies.

[IA4] Work with information that may be incomplete or uncertain, quantify the effect of this on the design or development of an engineering solution and, where appropriate, use theory or experimental research to mitigate deficiencies through the generation of new data

[IA5] Design and execute research experiments in the field of cancer research using your knowledge of core and specialised engineering concepts (e.g., machine learning, microfluidics, signal processing, imaging, blood sampling, among others).

[PT1] Work effectively with all members of a research team including students and academics, demonstrating good interpersonal and communication skills that show an appreciation for the different roles within a team

[PT2] Exercise initiative and judgement in a range of situations, identifying areas for self-learning and development, and accepting accountability for decisions made and the quality of outcomes produced.

[PT3] Work individually to plan and conduct a lengthy programme of original research, in a safe and ethical manner in laboratory or computational settings.

[PT4] Professionally communicate the results of a programme of original research through a variety of means including the preparation and/or delivery of presentations, written reports and scientific papers.

Upon successful completion of the *PG Diploma MRes Cancer Technology* programme you will be able to:

[KU1] Assess the underlying scientific principles and models that govern cancer progression and current challenges in cancer management.

[**KU2]** Evaluate the core concepts, principles and theories relevant to *Cancer Technology* and how these are relevant to historical, current and future developments and technologies in the *Cancer Technology* field.

[KU3] Evaluate a range of scientific studies in the Cancer technology field and critically discuss these examples in terms of their commercial, economic, social and sustainability implications.

[IA1] Critically select and apply engineering principles and tools for the analysis and solution of familiar and unfamiliar problems in the field of cancer research.

[IA2] Extract, analyse and critically evaluate information and data gathered from experimentation, academic and technical resources to determine their strength and validity, interpret conclusions and make recommendations for future experimental studies.

[IA3] Work with information that may be incomplete or uncertain, quantify the effect of this on the design or development of an engineering solution and, where appropriate, use theory or experimental research to mitigate deficiencies through the generation of new data

[IA4] Design and execute research experiments in the field of cancer research using your knowledge of core and specialised engineering concepts (e.g., machine learning, microfluidics, signal processing, imaging, blood sampling, among others).

[PT1] Work effectively with all members of a research team including students and academics.

[PT2] Exercise initiative and judgement in a range of situations, identifying areas for self-learning and development.

[PT3] Work individually to plan and conduct a lengthy programme of original research, in a safe and ethical manner in laboratory or computational settings.

[PT4] Professionally communicate the results of a programme of original research through a variety of means including the preparation and/or delivery of presentations and written reports.

Upon successful completion of the *PG Certificate Cancer Technology* programme you will be able to:

[KU1] Assess the underlying scientific principles and models that govern cancer progression and current challenges in cancer management.

[**KU2]** Evaluate the core concepts, principles and theories relevant to *Cancer Technology* and how these are relevant to historical, current and future developments and technologies in the *Cancer Technology* field.

[KU3] Evaluate a wide range of scientific studies in the Cancer technology field and critically discuss these examples in terms of their commercial, economic, social and sustainability implications.

[IA1] Critically select and apply engineering principles and tools for the analysis and solution of familiar and unfamiliar problems in the field of cancer research.

[IA2] Extract, analyse and critically evaluate information and data gathered from academic and technical resources to determine their strength and validity

[IA3] Work with information that may be incomplete or uncertain, and where appropriate, use theory to mitigate deficiencies through the generation of new data

[IA4] Design research experiments in the field of cancer research using your knowledge of core and specialised engineering concepts

[PT1] Work effectively with all members of a research team including students and academics

[PT2] Exercise initiative and judgement in a range of situations, identifying areas for self-learning and development

[PT3] Work individually to plan a programme of original research, in a safe and ethical manner in laboratory or computational settings.

[PT4] Professionally communicate technical ideas through a variety of means including the preparation and/or delivery of presentations, and written reports.

The Imperial Graduate Attributes are a set of core competencies which we expect students to achieve through completion of any Imperial degree programme. The Graduate Attributes are available at: www.imperial.ac.uk/about/education/our-graduates/

Entry Requirements

Academic Requirement	You are expected to have at minimum a 2.1 UK Honour's degree in an engineering discipline, physical science or mathematical subject or equivalent. Applicants with a minimum 2:1 UK Honour's degrees in medical science, biology or cancer related subject may be admitted if they have a demonstrated track record of training or engagement in engineering, biophysics, cancer technologies or mathematics.
Non-academic Requirements	N/A
English Language Requirement	Standard requirement (PG)
Admissions Test/Interview	Applicants may be invited to attend an interview with one or more members of academic staff, in person or virtually.

The programme's competency standards documents can be found at: https://www.imperial.ac.uk/media/imperial-college/faculty-of-engineering/bioengineering/public/student/Competency-Standards---Bioengineering-UG-PG---June-2016-Final.pdf

Learning & Teaching Approach

Learning and Teaching Delivery Methods

You will be taught through a combination of lectures, study groups and tutorials, computing labs, guest lectures and presentations. Study groups and tutorials will enable you to discuss and develop your understanding of topics covered in lectures whilst in smaller groups of around 30 students. These are usually based around problem sheets, questions or computational tasks set by the module lecturers. You will be expected to solve these either individually or as part of a small group. Study groups and tutorials are supported by graduate teaching assistants. Timetabled sessions may be delivered online or in person, or in a hybrid format.

The Virtual learning environment Blackboard will be used as a repository for teaching materials including recordings of all lectures, lecture notes and problem sheets. Learning technologies will be used to support teaching activities including in-class polling with Mentimeter, online self-diagnostic quizzes and online class forums.

Independent Learning

You are expected to spend significant time on independent study outside of timetabled learning and teaching sessions. From our experience students that undertake independent learning have improved academic performance, increased motivation and confidence in themselves and their abilities. By undertaking independent learning, you are also preparing yourself for professional practice where it is expected that you will manage your own continued professional development. Independent learning activities that you will be expected to undertake will typically include accessing online resources, completing problem sheets, reading journal articles and books, undertaking research in the library, reviewing lecture notes and watching lecture recordings, working on individual and group projects, working on coursework assignments and revising for exams.

Bioengineering uses flipped teaching for some modules, meaning that you need to actively engage with on-line resources ahead of attending timetabled sessions. This independent learning is followed by sessions led by the teacher where all students work in small groups to apply that knowledge to more practical examples. This helps you to further consolidate and enhance your understanding of the topics you study and allows us the time to focus on more challenging concepts in the taught sessions. These taught sessions are normally in the place of study groups for a flipped module

Research Project

A key part of our MRes programme is the Research Project. Mastery of bioengineering research within cancer is a complex and specialised field. Your Research Project is an opportunity for you to develop cutting edge research capabilities under the close supervision of academics and their research teams. This may include lecturers and clinicians from across Imperial and the Institute of Cancer Research.

You begin full-time project work in the spring term, working on the project for 9 months.

Overall Workload
Your overall workload consists of face-to-face sessions and independent learning. While your actual contact hours may vary according to the optional modules you choose to study, the following gives an indication of how much time you will need to allocate to different activities at each level of the programme. At Imperial, each ECTS credit taken equates to an expected total study time of 25 hours. Therefore, the expected total study time is 2,250 hours per year.

For taught modules, held mainly during the Autumn term, you will typically spend 90 hours in lectures and tutorials, with around 410 hours of individual study. Your research project accounts for 1750 hours of additional individual study.

Assessment Strategy

Assessment Methods

A variety of assessment methods will be used to test your understanding. Assessments are grouped as formative and summative.

Formative assessments do not contribute to the module mark but provide information on your progress as an individual and in the context of the class. This allows you to learn by using your new skills to solve problems and receive feedback on your performance to guide your future learning. This supports you to achieve a better performance in the summative assessments which do count towards your module marks. Formative assessments also provide feedback to the teaching staff which allow us to adapt our teaching.

Summative assessments are used to assess your learning against the intended module learning outcomes and contribute towards your achievement of the programme learning outcomes, detailed above. There is summative assessment during and/or at the end of each module and these assessments will contribute towards your mark for the year.

The design of our programme will allow you to test your understanding of the subject using formative assessments such as problem sheets, on-line diagnostic tests, practice presentations and mock/past examinations before you complete the summative assessments that count towards your final mark.

The taught modules will be assessed during the Autumn term using a combination of:
- Written examinations (open and closed book)
- Oral presentations
- Written reports, including a dissertation
- Coursework including progression tests, problem sheets
- Practical training elements

The research modules will be assessed at regular intervals throughout the degree using a combination of:
- Written Reports & Final Thesis
- Oral presentations
- Poster Presentations

The typical breakdown of assessments for this programme is:

Practical	50%
Coursework	40%
Exams	10%

Academic Feedback Policy

Feedback may be provided in one of a number of formats, including (but not limited to):
- Oral (during or after lectures, personally or as a group feedback session)
- Personal (discussion with academics during office hours, meetings with cohort and academic tutors)
- Interactive (problem solving tutorials with GTAs & study groups, peer feedback)
- Written (solutions/model answers to coursework, electronic feedback online)

Deadlines for submission of assessments and to receive feedback are indicated in the coursework calendars normally provided at the start of the teaching year. You will usually be provided with feedback within 10 working days although on occasions they may be informed of a different time scale (e.g. if the submitted work is particularly complex and will take a long time to mark).

Imperial's Policy on Academic Feedback and guidance on issuing provisional marks to students is available at: www.imperial.ac.uk/about/governance/academic-governance/academic-policy/exams-and-assessment/

Re-sit Policy
Imperial's Policy on Re-sits is available at: www.imperial.ac.uk/about/governance/academic-governance/academic-policy/exams-and-assessment/
Mitigating Circumstances Policy
Imperial's Policy on Mitigating Circumstances is available at: www.imperial.ac.uk/about/governance/academic-governance/academic-policy/exams-and-assessment/

Additional Programme Costs		
This section should outline any additional costs relevant to this programme which are not included in students' tuition fees.		
Description	Mandatory/Optional	Approximate cost
Textbooks	Mandatory	£150
Personal Protective Equipment	Mandatory	Provided

Important notice: The Programme Specifications are the result of a large curriculum and pedagogy reform implemented by the Department and supported by the Learning and Teaching Strategy of Imperial College London. The modules, structure and assessments presented in this Programme Specification are correct at time of publication but might change as a result of student and staff feedback and the introduction of new or innovative approaches to teaching and learning. You will be consulted and notified in a timely manner of any changes to this document.

Programme Structure[1]

FHEQ Level 7
You will study all core and compulsory modules.

***This module is considered as pass/fail and will not contribute to the overall weighted average for the programme used for classification of the programme**

Code	Module Title	Core/ Compulsory	Group	Term	Credits
BIOE70049	Bioengineering Approaches to Cancer	Compulsory	N/A	Autumn	5 ECTS
BIOE70037	Data Analysis for Research	Compulsory	N/A	Autumn	5 ECTS
BIOE70050	Frontiers in Cancer Technology Research	Compulsory	N/A	Autumn-Summer	5 ECTS
BIOE70051	Topics in Cancer Engineering*	Compulsory	N/A	Autumn-Spring	5 ECTS
BIOE70040	Planning for Research	Core	N/A	Autumn-Spring	10 ECTS
BIOE70052	Cancer Technology Research Project	Core	N/A	Autumn-Summer	60 ECTS
				Credit Total	90 ECTS

[1] **Core** modules are those which serve a fundamental role within the curriculum, and for which achievement of the credits for that module is essential for the achievement of the target award. Core modules must therefore be taken and passed in order to achieve that named award. **Compulsory** modules are those which are designated as necessary to be taken as part of the programme syllabus. Compulsory modules can be compensated. **Elective** modules are those which are in the same subject area as the field of study and are offered to students in order to offer an element of choice in the curriculum and from which students are able to select. Elective modules can be compensated.

Progression and Classification

Award of a Postgraduate Certificate (PG Cert)
To qualify for the award of a postgraduate certificate you must have a minimum of 30 credits at Level 7.

Award of a Postgraduate Diploma (PG Dip)
To qualify for the award of a postgraduate Diploma you must have a minimum of 60 credits at Level 7 of which no more than 10 credits as a Compensated Pass.

Award of a Masters Degree (including MRes)
To qualify for the award of a postgraduate degree you must have:

1. accumulated credit to the value of no fewer than 90 credits at level 7
2. and no more than 10 credits as a Compensated Pass;
3. met any specific requirements for an award as outlined in the approved programme specification for that award.

Classification of Postgraduate Taught Awards

1. Distinction: 70.00% or above.
2. Merit: 60.00% or above but less than 70.00%.
3. Pass: 50.00% or above but less than 60.00%.

For a Masters, your classification will be determined through the Programme Overall Weighted Average and the designated dissertation or final major project module meeting the threshold for the relevant classification band.

Your degree algorithm provides an appropriate and reliable summary of your performance against the programme learning outcomes. It reflects the design, delivery and structure of your programme without unduly over-emphasising particular aspects.

Programme Specific Regulations

Students on this MRes programme are subject to the standards set by the Engineering Council in relation to compensation. A maximum of 10 ECTS credits can be compensated across the programme

Supporting Information
The Programme Handbook is available at: www.imperial.ac.uk/bioengineering/admin/research/mres/
The Module Handbook is available from the department.
Imperial's entry requirements for postgraduate programmes can be found at: www.imperial.ac.uk/study/apply/postgraduate-taught/entry-requirements/
Imperial's Quality & Enhancement Framework is available at: www.imperial.ac.uk/registry/proceduresandregulations/qualityassurance
Imperial's Academic and Examination Regulations can be found at: www.imperial.ac.uk/about/governance/academic-governance/regulations
Imperial College London 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 Imperial's Centenary, 8th July 2007, established Imperial as a University with the name and style of "The Imperial College of Science, Technology and Medicine". www.imperial.ac.uk/admin-services/secretariat/university-governance-structure/charters/
Imperial College London is regulated by the Office for Students (OfS) www.officeforstudents.org.uk/advice-and-guidance/the-register/
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 they take full advantage of the learning opportunities provided. This programme specification is primarily intended as a reference point for prospective and current students, academic and support staff involved in delivering the programme and enabling student development and achievement, for its assessment by internal and external examiners, and in subsequent monitoring and review.