| Programme Information | | |
|---|---|---|
| Programme Title | Programme Code | HECoS Code |
| Genomic Medicine | A3GM | For Registry Use Only |

| Award | Length of Study | Mode of Study | Entry Point(s) | Total Credits | |
|---|---|---|---|---|---|
| | | | | ECTS | CATS |
| MSc (A3GM / A3GM24) | - 12 months (1 academic year) **or**<br>- 24 months (2 academic years) | - Full-time<br>- Part-time | Annually in October | 90 | 180 |
| PG Diploma (A3GD8 / A3GD24) | - 8 months **or**<br>- 24 months (2 academic years | - Full-time<br>- Part-time | Annually in October | 60 | 120 |
| PG Certificate (A3GC4 / A3GC12) | - 4 months **or**<br>- 12 months (1 academic year) | - Full-time<br>- Part-time | Annually in October | 30 | 60 |
| Students must apply for the qualification they wish to graduate from. | | | | | |

| Ownership | | | |
|---|---|---|---|
| Awarding Institution | Imperial College London | Faculty | Faculty of Medicine |
| Teaching Institution | Imperial College London | Department | National Heart and Lung Institute |
| Associateship | - Institute of Cancer Research *(1 x module)*<br>- Brunel University *(1 x module)* | Main Location(s) of Study | Various Locations (including Royal Brompton, Hammersmith and South Kensington) |
| **External Reference** | | | |
| Relevant QAA Benchmark Statement(s) and/or other external reference points | | There is no Master's level subject benchmark statement specifically encompassed by this programme, however, the programme has been designed in line with the requirements of Health Education England, the NHS and Genomics England Ltd. | |
| FHEQ Level | | Level 7 | |
| EHEA Level | | 2nd Cycle | |
| **External Accreditor(s) (if applicable)** | | | |
| External Accreditor 1: | None | | |
| Accreditation received: | N/A | Accreditation renewal: | N/A |

| Collaborative Provision | | | |
|---|---|---|---|
| Collaborative partner | Collaboration type | Agreement effective date | Agreement expiry date |
| - Institute of Cancer Research<br>- Brunel University London | - Collaborative Module Agreement<br>- Collaborative Module Agreement | - Since 2015<br>- Since 2016 | - September 2023<br>- September 2025 |

| Specification Details | |
|---|---|
| Programme Lead | Prof Michael Lovett |
| Student cohorts covered by specification | 2022-23 entry |
| Date of introduction of programme | October 15 |
| Date of programme specification/revision | October 22 |

## Programme Overview

This clinical Master's level programme will educate students from a wide range of backgrounds (e.g. medicine, nursing, healthcare scientists and technologists) to interpret and understand genomic DNA data that increasingly impacts on service delivery to patients.

The aim of the programme is to enhance knowledge and skills in this rapidly evolving field by providing a flexible, multi-disciplinary and multi-professional perspective in genomics as applied to clinical practice and medical research. In so doing, it fulfils the requirements of Genomics England, Health Education England and Public Health England for MSc, PG Dip and PG Cert programmes to transform the NHS workforce in readiness for the 100,000 Genomes Project and subsequent projects, set out in a tender in 2017. Imperial College was successful in its bid to continue to run the programmes and has been designated a preferred provider by Health Education England.

The programme comprises core, compulsory and optional taught modules of 7.5 ECTS each that will be taught using a blended approach (direct teaching and online distance learning) to provide flexibility for health professionals to combine their study with NHS and Public Health service duties. The MSc programme also includes a core research project module (30 ECTS).

Most modules will consist of one week of face-to face teaching and up to three weeks of e-learning and independent study (exceptions are noted below).

The modules are offered on a cycle of 12 months, so that all modules become available once in each 12-month cycle.

The programme includes collaborations with the Institute of Cancer Research (providing the core '*Molecular Pathology of Cancer and Application in Cancer Diagnosis, Screening and Treatment'* module), and Brunel University London (providing the optional '*Economic Evaluation in Human Genomics*' module). The Institute of Cancer Research and Brunel may also co-supervise research projects.

The programme is flexible and modular and includes full- and part-time MSc options, delivered over one or two years respectively. There are also full-time and part-time Postgraduate Certificate (PG Cert) or Postgraduate Diploma (PG Dip) options. If choosing the full-time PG Cert or PG Diploma mode of study students should be aware that module choices will be limited. Students will be made aware of their options during the admissions process. Some optional modules may not run if there is not enough demand.

Applicants who do not meet the College's normal entry requirements but who have substantial relevant healthcare experience in a related healthcare field may be considered for admission.

## Learning Outcomes

On graduation, all students will be able to:

**PG Cert**

- Critically review and synthesise genomic medicine data from a range of sources;
- Communicate core concepts in genomic medicine clearly and effectively with both scientifically-literate and lay audiences;
- Evaluate the potential of large-scale patient genome analysis to revolutionise healthcare in at least one domain;
- Review and reflect on coursework evaluation, project reports, critical reviews of scientific papers.

**PG Dip**

Learning Outcomes for the PG Cert plus:

- Evaluate the potential of large-scale patient genome analysis to revolutionise healthcare across inherited disease, cancer and infectious disease and its implications in the healthcare setting;
- Critically analyse the societal and ethical context of genomic medicine, including the complexities of protecting patient information. This is achieved through a mixture of lectures, debates, role play, review of journal papers/regulations and interaction with patients.
- Review and critique the strengths and limitations of techniques suitable for assessing genomic variation relating to different clinical problems and disease states;
- Competently analyse and interpret patient genomic analysis results and communicate their implications effectively to the patient.

**MSc**

Learning Outcomes for PG Cert and PG Dip plus:

- Demonstrate synoptic knowledge and deep understanding of medical genomics;
- Deploy effective problem-solving strategies in data analysis and experimental design;
- Critically evaluate the success, failure and the uncertainty inherent in research through extensive chronological examples from the literature and multiple journal club
- Effectively communicate scientific information in both written and oral forms;
- Use project management skills in the context of the research project;
- Select and deploy suitable research resources and strategies to be able to formulate a research proposal and be able to conduct scientific research.
- Synthesise complex research findings into a clear dissertation and oral presentation.

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

## Entry Requirements

| | |
|---|---|
| Academic Requirement | The minimum requirement is normally a 2.1 Bachelor's Degree with in a relevant medical, biomedical or healthcare subject (or a comparable qualification recognised by the College). |
| Non-academic Requirements | Please refer to Programme Overview section |
| English Language Requirement | Standard requirement (PG)<br>IELTS score of 6.5 overall (minimum 6.0 in all elements). |
| Admissions Test/Interview | All short-listed applicants will be interviewed (either in person or via teleconferencing). |

The programme's competency standards documents can be found at: TBA

## Learning & Teaching Approach

**Learning and Teaching Delivery Methods**

In addition to lectures, keynote lectures and seminars, all modules will contain elements of team-based and problem-based learning, journal clubs and e-learning. Content delivery will be by internal and external experts in the relevant fields.

Teaching is inclusive and Blackboard Learn will be used to facilitate module communication and access to all teaching materials, discussion forums and interactive module quizzes Reading lists, lecture recordings and slides are provided, along with interactive tutorials, lectures and quizzes via platforms such as Sway, Articulate Rise and Blackboard learn.

Most modules consist of one week of synchronous and asynchronous live teaching. Interactive learning tools used to facilitate interaction and group tasks for in-person or online learning. Groups are created to ensure a spread of educational and professional backgrounds to further facilitate student learning opportunities. Journal clubs are facilitated by the module leader and subject matter experts, students are required to work in groups to research, present and answer questions posed by the leaders and other groups.

Laboratory skills will be developed through relevant laboratory teaching and the 14-week research project. In addition, you will be expected to learn independently.

The programme offers laboratory-based, clinically-based, computer-based or literature-based research projects.
Examples of research projects:
Wet lab:
“Understanding and evaluating the role of tumour-specific genetic markers for colorectal cancer monitoring”
Dry Lab:
“Network Analysis of Gene Expression during peanut-induced anaphylaxis in humans”
Literature-based:
‘Systematic review and protocol development for personalised upper GI surveillance in Lynch Syndrome”

**Overall Workload**

Your overall workload consists of face-to -face sessions and independent learning. Your actual contact hours may vary according to the optional modules you choose to study. At Imperial, each ECTS credit taken equates to an expected total study time of 25 hours. All taught Core, Compulsory and Elective modules are 7.5 ECTS. The Research Project Module is 30 ECTS.

## Assessment Strategy

### Assessment Methods

The main assessment types are coursework and practicals:
- **Coursework**: Deadlines for coursework assessments are usually set for the end of each module.
- **Practicals**: Modules such as *Pharmacogenomics* and *Genome-based Therapeutics* include an oral or poster presentation. The MSc research project also includes an oral presentation to a mixed audience with two internal examiners (Sep)

**Research Project:** The submission deadline for full-time students is early-September while for part-time students, it is within 12 months.

### Academic Feedback Policy

Feedback will be appropriately tailored for the type of assessment and will be provided in a timely manner. The exact turnaround time will depend upon the length and complexity of the submission, but will normally be within two weeks. Where it is longer, students will be told when they may expect to receive their feedback.

The College’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

Students will be permitted to re-enter a failed examination on a single occasion within the same academic year. A failed piece of coursework can be resubmitted on one occasion, following ratification and approval by the Board of Examiners. Re-sitting/re-submitting assessments will normally be capped at the pass mark.

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|---|
| The College's Policy on Re-sits is available at: www.imperial.ac.uk/student-records-and-data/for-current-students/undergraduate-and-taught-postgraduate/exams-assessments-and-regulations/ |
| Mitigating Circumstances Policy |
| The College's Policy on Mitigating Circumstances is available at: www.imperial.ac.uk/student-records-and-data/for-current-students/undergraduate-and-taught-postgraduate/exams-assessments-and-regulations/ |

| 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 |
| N/A | N/A | N/A |

**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] | | | | | |
|---|---|---|---|---|---|
| **PGCert – FHEQ Level 7** | | | | | |
| Code | Module Title | Core/ Elective/ Compulsory | Group | Term | Credits |
| NHLI70039 | Fundamentals in Human Genetics and Genomics | Core | | 1 | 7.5 |
| **In total, students must complete the *Fundamentals* module above and any three further modules (listed below).** | | | | | |
| | | | | **Credit Total** | **30** |
| **PGDip - FHEQ Level 7** | | | | | |
| Code | Module Title | Core/ Elective/ Compulsory | Group | Term | Credits |
| NHLI70039 | Fundamentals in Human Genetics and Genomics | Core | | 1 | 7.5 |
| NHLI70038 | Omics Technologies and their Application to Genomic Medicine | Compulsory | | 1 | 7.5 |
| NHLI70037 | Genomics of Common and Rare Inherited Diseases | Compulsory | | 1 | 7.5 |
| NHLI70036 | Molecular Pathology of Cancer and Application in Cancer Diagnosis, Screening and Treatment | Core | | 2 | 7.5 |
| NHLI70040 | Application of Genomics in Infectious Disease | Core | | 3 | 7.5 |
| NHLI70041 | Bioinformatics, Quality Control, Analysis & Interpretation of Sequencing Data | Compulsory | | 3 | 7.5 |
| **In total, students must complete all six core/compulsory modules above plus one Elective A module and one Elective B module from the list shown below.** | | | | | |
| NHLI70042 | Ethical, Legal and Social Issues in Applied Genomics | Elective | A | 2 | 7.5 |
| NHLI70043 | Genomics and the Patient | Elective | A | 2 | 7.5 |
| NHLI70044 | Pharmacogenomics and Stratified Medicine | Elective | B | 2 | 7.5 |
| NHLI70045 | Economic Evaluation in Human Genomics | Elective | B | 2 | 7.5 |
| NHLI70046 | Genome-Based Therapeutics | Elective | B | 2 | 7.5 |
| NHLI70047 | Professional and Research Skills | Elective | B | 2 | 7.5 |

[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.

| | | | | | |
|---|---|---|---|---|---|
| | | | | **Credit Total** | **60** |
| **MSc - FHEQ Level 7** | | | | | |
| Code | Module Title | Core/ Elective/ Compulsory | Group | Term | Credits |
| NHLI70039 | Fundamentals in Human Genetics and Genomics | Core | | 1 | 7.5 |
| NHLI70038 | Omics Technologies and their Application to Genomic Medicine | Compulsory | | 1 | 7.5 |
| NHLI70037 | Genomics of Common and Rare Inherited Diseases | Compulsory | | 1 | 7.5 |
| NHLI70036 | Molecular Pathology of Cancer and Application in Cancer Diagnosis, Screening and Treatment | Core | | 2 | 7.5 |
| NHLI70040 | Application of Genomics in Infectious Disease | Core | | 3 | 7.5 |
| NHLI70041 | Bioinformatics, Quality Control, Analysis & Interpretation of Sequencing Data | Compulsory | | 3 | 7.5 |
| NHLI70042 | Ethical, Legal and Social Issues in Applied Genomics | Elective | A | 2 | 7.5 |
| NHLI70043 | Genomics and the Patient | Elective | A | 2 | 7.5 |
| NHLI70044 | Pharmacogenomics and Stratified Medicine | Elective | B | 2 | 7.5 |
| NHLI70045 | Economic Evaluation in Human Genomics | Elective | B | 2 | 7.5 |
| NHLI70046 | Genome-Based Therapeutics | Elective | B | 2 | 7.5 |
| NHLI70047 | Professional and Research Skills | Elective | B | 2 | 7.5 |
| NHLI70048 | Genomics Medicine Research Project | Core | | 3 & 4 | 30 |
| **In total, students must complete all six core/compulsory taught modules, one Elective A module and one Elective B module, and an independent Research Project.** | | | | | |
| | | | | **Credit Total** | **90** |

## Progression and Classification

**Award of a Postgraduate Certificate (PG Cert)**
To qualify for the award of a postgraduate certificate a student 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 a student must have passed modules to the value of no fewer than 60 credits at Level 7 (this may include no more than 10 credits as a Compensated Pass)

**Award of a Postgraduate Degree (MSc)**
To qualify for the award of a postgraduate degree a student must have:

1. accumulated credit to the value of no fewer than 90 credits at level 7;
2. and no more than 15 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**
The College sets the class of Degree that may be awarded as follows:

1. Distinction: The student has achieved an overall weighted average of 70.00% or above across the programme.
2. Merit: The student has achieved an overall weighted average of above 60.00% but less than 70.00%.
3. Pass: The student has achieved an overall weighted average of 50.00% but less than 60.00%.

a. For a Masters, students must normally achieve a distinction (70.00%) mark in the dissertation or designated final major project (as designated in the programme specification) in order to be awarded a distinction.
b. For a Masters, students must normally achieve a minimum of a merit (60.00%) mark in the dissertation or designated final major project (as designated in the programme specification) in order to be awarded a merit

## Programme Specific Regulations

**Rules for progression**
All students must pass a zero weighted, not for credit, on-line Genomic Medicine Primer course. Students enrolled on the PG Cert who wish to continue on the programme without a break can transfer to the PG Dip after completing the Fundamentals module and two other modules, provided they have demonstrated satisfactory academic progress in their first three modules. Similarly, students enrolled on the PG Dip can transfer to the MSc after completing two further modules, provided they have demonstrated satisfactory academic progress. In these cases, progression to the upper degree will depend on ratification by an interim meeting of the Exam Board.

Students who register for and successfully complete the PG Cert may use the credit gained towards registration for the PG Dip or the MSc at a later point, provided that the PG Dip is completed within 4 years and the MSc is completed within 5 years, of initial registration for the Postgraduate Certificate. These students may be asked to surrender the associated PG Cert and/or PG Diploma on registration for the higher award.

Likewise, students who register for and successfully complete the PG Dip may use the credit gained towards the MSc, provided that the MSc is completed within 5 years of their initial registration of the lowest award. These students may be asked to surrender the associated PG Dip on registration for the MSc.

Students who register for the MSc in the first instance will have a “virtual” PG Cert confirmed if the requirements for the PG Cert have been met. The pass mark for the PG Cert will be carried forward and the credits will accumulate towards the next level. On successful completion of eight modules (six Core/Compulsory, one Elective A and one Elective B), students will have a “virtual” PG Dip. The pass mark will be carried forward and the credits will accumulate towards the MSc. Should these students subsequently fail to achieve the requirements for the MSc they will be awarded the PG Dip.

| Supporting Information |
|---|
| The **2022-23 Programme Handbook** is available on Blackboard here. |
| Module information can be found in the **2022-23 Programme Handbook** available on Blackboard. |
| 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: 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". www.imperial.ac.uk/admin-services/secretariat/college-governance/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 s/he takes 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. |

| Modifications | | | |
|---|---|---|---|
| **Description** | **Approved** | **Date** | **Paper Reference** |
| Curriculum Review | Programmes Committee | 29/03/22 | PC.2021.84 |