

Programme Specification 2022-2023

Master of Studies in Genomic Medicine Postgraduate Certificate in Genomic Medicine Postgraduate Diploma in Genomic Medicine

Awarding body	University of Cambridge
Teaching institution	University of Cambridge, Institute of Continuing Education*
Accreditation details	None
Name of final award	Postgraduate Certificate Postgraduate Diploma Master of Studies (MSt)
Programme title	Genomic Medicine**
UCAS code	N/A
HECoS code(s)	
Relevant QAA benchmark statement(s)	None
Qualifications framework level	Level 7 (All PG and Masters)]
Date specification produced	August 2023

* Cognate Faculty endorsement provided by the School of Clinical Medicine

** Component modules carry 15 FHEQ Level 7 credits

The mission of the Institute of Continuing Education (ICE) is to support the University of Cambridge's promise to prioritise and enable learning throughout life and to promote the widest possible access for learners to the University. ICE uses the expertise of its staff, the collegiate University, and its wider networks to deliver a broad portfolio of research-informed world-leading qualifications. ICE delivers supportive and inclusive education and welcomes learners seeking to engage with higher education for the first time, returning after an extended break, seeking opportunities to learn later in life and looking to advance their careers.

The Cambridge Genomic Medicine Programme has been developed by the University and Cambridge University Hospitals (CUH) in partnership with Wellcome Trust Sanger Institute (WTSI) and European Bioinformatics Institute (EBI) and the Wellcome Genome Campus Advanced Courses and Scientific Conferences.

The Genomic Medicine Programme is designed to be flexible and accessible to both full time students and working healthcare professionals. The Programme is designed to educate suitably-qualified students, including NHS healthcare professionals from across the multi-professional team to prepare for the future adoption of genomic technologies in the NHS and to prepare research students for future careers in research laboratories and medicine.

The part-time Genomic Medicine Programme comprises a modular part-time Postgraduate Certificate in Genomic Medicine, a Postgraduate Diploma in Genomic Medicine and a part-time Master of Studies (MSt) in Genomic Medicine. The Genomic Programme is designed to be flexible and accessible to working healthcare professionals, providing Options for studying individual modules and progressing as time permits from one award to the next.

Educational aims

<<Outline the overall educational aims of the programme. These should be consistent with the OFS sector-recognised standards level of the course and not excessive in number>>

The programme of study aims to:

1. provide professionally relevant teaching and learning informed by research in an integrated clinical and research environment;
2. develop and create a cohort of doctors and other professionals allied to medicine able to pursue and develop their roles in the rapidly-changing and challenging environment of genomic medicine;
3. prepare healthcare professionals for the adoption of genomic technologies and the increasing use of genomic information as part of the diagnostic and treatment pathway;
4. develop researchers competent in the use of genomic technologies for biomedical research
5. develop a cohort of health care professionals with the ability and confidence to lead service improvement for safe and high quality patient care
6. develop a cohort of health care professionals allied to medicine with an understanding of research methodologies and clinical opportunities relevant to genomic medicine;
7. encourage a commitment to intellectual challenge and evidence-based clinical practice informed by the latest conceptual and theoretical knowledge of genomic medicine;
8. develop students' intellectual, practical and transferable skills related to genomic medicine;
9. encourage critical thinking related to genomic medicine;
10. for the MSt, to conduct systematic research relevant to their professional practice;
11. Equip students for entry into health care professional training schemes including graduate entry medicine courses;
12. Prepare students for undertaking research degrees (PhD) in genomic medicine-related research fields;
13. Provide students from the pharmaceutical, biotechnology and other industries with an understanding of the relevance of advances in genomics for current and future health care.

Learning outcomes

<<Provide all learning outcomes for the course. These should be consistent with the OFS sector-recognised standards level of the course and you may find reference to the SEEC level descriptors (<https://seec.org.uk/wp-content/uploads/2021/03/SEEC-Credit-Level-Descriptors-2021.pdf>) helpful in articulating the learning outcomes. All learning outcomes should be demonstrable through the assessments>>

As a result of studying this programme students should meet the following learning outcomes.

Knowledge and understanding

- To enhance the students' knowledge and critical understanding of recent developments in genomic medicine relevant to their present and future roles.
- To develop students' knowledge and understanding of genomic medicine informed by research in a rapidly-changing integrated clinical and research environment.
- To enable deployment of new knowledge in their clinical practice, and to have a positive personal impact on the work of others in their clinical team and wider service.

- To develop an understanding of genomic technologies and to be able to use genomic information as part of the diagnostic and treatment pathway.
- To develop students' knowledge so that they have the confidence to lead service improvement for safe and high quality patient care.
- To update and extend students' understanding of research methodologies and clinical opportunities.
- To demonstrate knowledge, abilities and skills to engage in focused, professionally-relevant, independent learning, and (for the MSt) through the production of a dissertation.

Skills and other attributes

- The skills necessary to locate, read, interpret and analyse primary and secondary sources of material enabling the development of a conceptual and theoretical understanding of recent developments in genomic medicine.
- Skills to evaluate current scholarship and research critically and to place this knowledge within the context of their own situation and practice as clinical leaders.
- For the MSt, the ability to formulate a research topic relevant to their clinical context, to collect and analyse primary and/or secondary sources of data, and to undertake professionally relevant research.
- For the MSt, the facility to communicate the results of their ideas, research and its conclusions in a written form acceptable as a work of scholarship potentially publishable in a professional or academic journal.

Programme structure

Postgraduate Certificate in Genomic Medicine

The Postgraduate Certificate in Genomic Medicine is a one-year part-time M-level programme resulting in 60 FHEQ level-7 credits and the University of Cambridge award.

The Postgraduate Certificate in Genomic Medicine can be taken as a stand-alone award or as a platform for further study of the Postgraduate Diploma and Master of Studies in Genomic Medicine.

Students must complete four modules chosen from a range of modules, some of which are Core and some of which are Optional modules. There is additional between-module reflection, study and assignment work. The list of Core and Optional modules is announced by the Degree Committee for the Faculties of Clinical Medicine and Veterinary Medicine by the end of the Easter Term preceding the examination, stipulating which modules are Core and which are Optional.

The following is a list of likely modules, but as noted above, the list of Core and Optional modules is not announced by the Degree Committee until the Easter Term preceding the examination. Not all of the modules below will necessarily be offered in any one year:

- An introduction to human genetics and genomics
- Omics techniques and the application to genomic medicine
- Genomics of common and rare disease
- Molecular pathology of cancer and application in cancer diagnosis, screening, and treatment
- Application of genomics to infectious disease
- Pharmacogenetics and stratified healthcare

- Bioinformatics, interpretation, and data quality assurance in genome analysis
- Ethical, Legal and Social Implications in applied genomics (ELSI)
- Counselling skills for genomics
- Professional and research skills
- Advanced Bioinformatics – from genomes to systems
- Epigenetics and epigenomics
- Research and statistical skills for Genomic Medicine
- Workplace-based module

Each module generally requires submission of an assignment of 2500-3500 words or equivalent, and modules are equally weighted, providing 15 FHEQ-7 credits if successfully completed.

Postgraduate Diploma in Genomic Medicine

The Postgraduate Diploma in Genomic Medicine is a two-year part-time M-level programme resulting in 120 FHEQ-7 credits and the University of Cambridge award.

Students must complete eight modules chosen from a range of modules, some of which are Core and some of which are Optional. There is additional between-module reflection, study and assignment work. The list of Core and Optional modules is announced by the Degree Committee for the Faculties of Clinical Medicine and Veterinary Medicine by the end of the Easter Term preceding the examination, stipulating which modules are Core and which are Optional.

The following is a list of likely modules, but as noted above, the list of Core and Optional modules is not announced by the Degree Committee until the Easter Term preceding the examination. Not all of the modules below will necessarily be offered in any one year:

- An introduction to human genetics and genomics
- Omics techniques and the application to genomic medicine
- Genomics of common and rare disease
- Molecular pathology of cancer and application in cancer diagnosis, screening, and treatment
- Application of genomics to infectious disease
- Pharmacogenetics and stratified healthcare
- Bioinformatics, interpretation, and data quality assurance in genome analysis
- Ethical, Legal and Social Implications in applied genomics (ELSI)
- Counselling skills for genomics
- Research and statistical skills for genomic medicine
- Advanced Bioinformatics – from genomes to systems
- Epigenetics and epigenomics
- Workplace-based module

A student who has successfully completed the Postgraduate Certificate in Genomic Medicine who wishes then to complete the Postgraduate Diploma will, if admitted (which would normally need to be within two years of completing the Postgraduate Certificate), have the need to complete four modules waived, and will be required to complete four additional modules chosen from the list of Core and Optional modules, in one year.

The Postgraduate Diploma subsumes the Postgraduate Certificate; if a student holding the Postgraduate Certificate progresses to the Postgraduate Diploma or returns to complete the Postgraduate Diploma at a later date, then, on successful completion, any prior award of the Postgraduate Certificate is withdrawn in favour of the award of the Postgraduate Diploma.

Each module generally requires submission of an assignment of 2500-3500 words or equivalent.

Master of Studies (MSt) in Genomic Medicine

The MSt in Genomic Medicine is a two-year part-time master's degree (FHEQ level-7) of the University of Cambridge.

The MSt in Genomic Medicine builds on the generic platform of taught Core and Optional modules provided by the Postgraduate Certificate in Genomic Medicine and the Postgraduate Diploma in Genomic Medicine.

The MSt comprises either:

- eight modules, as described by the Postgraduate Diploma, plus a 60 credit research project and associated dissertation of 10,000-12,000 words or the equivalent on an agreed topic in genomic medicine; or
- ten modules comprising eight modules as described by the Postgraduate Diploma plus two additional Optional modules, plus a 30 credit literature-based research project and associated dissertation of 5,000-6,000 words or the equivalent on an agreed topic in genomic medicine.

It is expected that students will be admitted for the MSt degree and would normally conduct the majority of either the research project or literature-based project plus two additional Optional modules in the second year, in parallel with four of the taught modules..

A student who has successfully completed the Postgraduate Certificate in Genomic Medicine who wishes then to complete the MSt will, if admitted (which would normally need to be within two years of completing the Postgraduate Certificate), have the need to complete four modules waived, and will be required to complete four additional modules chosen from the list of Core and Optional modules and either the 60 credit research project or 30 credit project plus two additional Optional modules, in one year.

A student who has successfully completed the Postgraduate Diploma in Genomic Medicine who wishes then to complete the MSt will, if admitted (which would normally need to be within two years of completing the Postgraduate Diploma), have the need to complete eight modules waived, and will be required to complete the research project and associated dissertation, or the literature-based research project, associated dissertation, and two additional Optional modules, in one year.

The MSt subsumes the Postgraduate Diploma and the Postgraduate Certificate; if a student holding the Postgraduate Certificate or Postgraduate Diploma progresses to the MSt or returns to complete the MSt at a later date, then, on successful completion, any prior award of the Postgraduate Certificate or Postgraduate Diploma is withdrawn in favour of the award of the MSt degree.

Teaching methods

For postgraduate courses:

The programme is delivered through a combination of in-person teaching sessions and asynchronous approaches provided via the course virtual learning environment. Examples of the type of teaching methods used include, but are not limited to, live and pre-recorded lectures, seminars, group discussions, online readings, quizzes, data handling exercises, group activities and discussion forums. Peer-to-peer learning forms an important element of course teaching.

Assessment methods

The programme will contain items of formative (not counting towards the final mark) and summative (counting towards the final mark) assessment. Formative assessment will receive tutor and/or peer feedback and is designed to facilitate completion of the summative assessments. Summative assessments will consist of tasks appropriate to the discipline of study and may include, but not be limited to, essays, reports, presentations, posters, critical reviews, data handling and analysis, and group activities. The volume of work required to complete the award shall be 9,000–12,000 words or the equivalent.

- Students are assessed *formatively* throughout the taught modules of the programme using a variety of techniques and interrelated strategies including evidence of regular reflection; demonstration of active participation in the programme will also be required. There may also be a requirement for the students to take part in peer review of other students.
- For each of the four taught modules comprising the Postgraduate Certificate, students must complete summative assignments of 2500-3500 words or equivalent.
- For the Postgraduate Diploma, students must complete assignments of 2500-3500 words or equivalent for each of the taught modules (except where other methods of module assessment are indicated in individual module descriptions).
- For entry to the MSt from the Postgraduate Certificate, students must normally have successfully completed the Postgraduate Certificate with an average mark of at least 60% (or Grade Band B).
- For entry to the MSt from the Postgraduate Diploma, students must normally have successfully completed the Postgraduate Diploma with an average mark of at least 60% (or Grade Band B).
- For students admitted directly to the MSt, for progression from the first year to the second year normally requires an average mark of at least 60% (or Grade Band B) in the first-year assignments.
- Resubmissions are not permitted for students on the Postgraduate Certificate, Postgraduate Diploma and MSt
- Students who do not complete the requirements for the MSt may be awarded (if not already held) the Postgraduate Diploma or a Postgraduate Certificate in Genomic Medicine as appropriate to reflect the elements of the programme successfully completed.
- For the MSt, in addition to the requirements stipulated above for a Postgraduate Diploma, students must submit either a 60 credit research dissertation of 10,000-12,000 words, or the equivalent, or a 30 credit literature-based research dissertation of 5,000-6,000 words, or the equivalent and complete two summative assignments of 2500-3500 words or equivalent relating to two additional Option modules.
- Students who do not complete the requirements for the MSt may be awarded (if not already held) the Postgraduate Diploma or a Postgraduate Certificate in Genomic Medicine as appropriate to reflect the elements of the programme successfully completed.

Awards

- The required level for a pass mark for individual modules is 60%.

- For the Postgraduate Certificate and Diploma the required level of a pass mark (when aggregating the moderated assignment marks) is 60%. A Distinction will be awarded to candidates who achieve greater or equal to 75%
- For the MSt the required level for a pass mark (when aggregating the moderated assignment and dissertation marks) is 60%. A Distinction will be awarded to candidates who achieve greater or equal to 75%

Entry and/or progression requirements

Postgraduate Courses

Applicants are normally expected to hold a 2i degree or higher from a UK university or an equivalent from an overseas university in a relevant subject. Applicants without this level of academic qualification may be considered as non-standard applicants if they have an appropriate level of professional experience relevant to the programme.

Applicants are expected to demonstrate proficiency in the English language and must be able to satisfy the current English Language Competence requirements of the University's Postgraduate Admissions Committee in the year in which they apply for admission to the course and outlined on the course webpage.

Student support

<<For non-matriculated programmes>>

ICE provides all students with access to learning and welfare support via the Institute's virtual learning environment. This includes generic and subject specific learning resources and wider support services, including those focused on wellbeing.

<<For matriculated programmes>>

The collegiate University provides all students with access to learning and welfare support throughout their course. This includes generic and subject specific learning resources and wider support services, including those focused on wellbeing.

All MSt students are members of a College and have access to learning support from their College, the Institute of Continuing Education and the University's resources including those of the Faculty of Clinical Medicine, students have access to induction sessions in the University Library, a session introducing the University computing facilities, including the programme's VLE.

Postgraduate Certificate and Postgraduate Diploma students are not members of a College but have access to learning support from the Institute of Continuing Education and those of the Faculty of Clinical Medicine. The programme's VLE holds generic and subject specific learning resources. Students have borrowing rights in the University Library and can access the library's online resources. On request they may also have a letter of introduction for university or college libraries for the area in which they live if this is not Cambridge.

The Programme Handbook provides comprehensive details of the programme, contact details and academic and general advice. Students are invited to attend lectures and events organised by the Faculty of Clinical Medicine and other relevant departments.

Management of teaching quality and standards

The University ensures high standards of teaching and learning in the following ways:

- Participation in the biennial Education Monitoring and Review Process to explore provision, share good practice and suggest constructive courses of action
- Scrutiny of the reports of External Examiners for all teaching programmes
- Encouraging student engagement at both the local level, through involvement in Faculty and Departmental Committees, and at a central level by participation in nationally-benchmarked surveys
- Mentoring, appraisal, and peer review of staff, and encouraging staff participation in personal development programmes

The Institute of Continuing Education and the Faculty of Clinical Medicine participate in the University's quality assurance and enhancement system. Academic oversight of the MSt lies with the Degree Committee of the Faculty of Clinical Medicine, which may be facilitated through the Genomic Medicine Degree Sub-Committee; direct academic management of the MSt is undertaken within the Institute of Continuing Education. The decisions of the MSt Degree Sub-Committee are reported to the Degree Committee of the Faculty and to the Academic Operations Committee of the Institute of Continuing Education and examiners' reports are submitted to the Vice Chancellor of the University.

The teaching quality and standards of the Postgraduate Certificate and Postgraduate Diploma will be monitored for coherency also by the Genomic Medicine Degree Sub-Committee.

- **Examining of Assignments:** The assignments are independently marked by two assessors. The Moderating External Examiner adjudicates on any significant discrepancies in marks. In line with University practice s/he may request to see all essays or a sample, as well as those gaining a bare pass/fail and a distinction.
- **Examining of MSt Dissertations:** MSt PGT programmes require each dissertation to be independently marked by two assessors and oral examinations are arranged in the event of a borderline fail. The Moderating External Examiner adjudicates on any significant discrepancies in marks and also reviews all fail and potential high performance passes. The Moderating External Examiner may also be invited to participate in any viva voce examinations. The Moderating External Examiner submits a report to the Vice Chancellor, which is copied to the Faculty of Clinical Medicine Degree Committee and the Strategic Committee of the Institute of Continuing Education
- **Student Evaluation.** Opportunities are provided during each period of teaching to discuss progress and any problems. MSt students' progress is also monitored by their supervisor. Students are regularly asked to complete evaluation forms, which form the basis of annual reviews of the programme.

The teaching quality and standards of the programme are monitored throughout by the Genomic Medicine Degree Sub-Committee, the examiners and appropriate members of academic staff.

Graduate employability and career destinations

Preparation for employment in general is provided in the opportunities for the acquisition of relevant transferable skills outlined in this programme specification. Where programmes with a significant vocational or professional element are accredited by Professional, Regulatory or Statutory Bodies details are given above.

The Careers Service maintains links with employers and takes their needs and opinions into account in the services which it provides for students. The Careers Service also allocates a Careers Adviser to each College, faculty and department to act as a point of contact.

Every effort has been made to ensure the accuracy of the information in this programme specification. At the time of publication, the programme specification has been approved by the relevant Faculty Board (or equivalent). Programme specifications are reviewed annually, however, during the course of the academical year, any approved changes to the programme will be communicated to enrolled students through email notification or publication in the *Reporter*. The relevant faculty or department will endeavour to update the programme specification accordingly, and prior to the start of the next academical year.

Further information about specifications and an archive of programme specifications for all awards of the University is available online at: <https://www.camdata.admin.cam.ac.uk/>