UNIVERSITY OF CAMBRIDGE

Programme Specification 2019-20

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

Awarding body	University of Cambridge
Teaching institution	Institute of Continuing Education *
Accreditation details	None
Name of final award	Postgraduate Certificate Postgraduate Diploma Master of Studies (MSt)
Programme title	Postgraduate Certificate in Genomic Medicine ** Postgraduate Diploma in Genomic Medicine ** MSt in Genomic Medicine
UCAS code	n/a
HECoS code(s)	100901 (genomics)
Relevant QAA benchmark statement(s)	None
Qualifications framework level	FHEQ Level 7 (Masters), PGT
Date specification produced	July 2020

* Cognate Faculty endorsement provided by the School of Clinical Medicine
** Component modules carry 15 FHEQ Level 7 credits

Update June 2020: From mid-March 2020 the COVID-19 pandemic resulted in all course teaching switching to emergency remote delivery, using video-based teaching methods and the Virtual Learning Environment. Learning outcomes were unaffected and assessed appropriately.

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

The overall aims of the programme are to:

- provide professionally relevant teaching and learning informed by research in an integrated clinical and research environment;

- 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;
- prepare healthcare professionals for the adoption of genomic technologies and the increasing use of genomic information as part of the diagnostic and treatment pathway;
- develop researchers competent in the use of genomic technologies for biomedical research
- develop a cohort of health care professionals with the ability and confidence to lead service improvement for safe and high quality patient care
- develop a cohort of health care professionals allied to medicine with an understanding of research methodologies and clinical opportunities relevant to genomic medicine;
- encourage a commitment to intellectual challenge and evidence-based clinical practice informed by the latest conceptual and theoretical knowledge of genomic medicine;
- develop students' intellectual, practical and transferable skills related to genomic medicine;
- encourage critical thinking related to genomic medicine;
- for the MSt, to conduct systematic research relevant to their professional practice.
- Equip students for entry into health care professional training schemes including graduate entry medicine courses
- Prepare students for undertaking research degrees (PhD) in genomic medicine-related research fields
- 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
The over-arching learning outcomes are:

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

- Teaching methods will include a combination of interactive seminars, large and small group work with some emphasis on peer review and reflection.
- Blended learning courses combining face-to-face delivery and online delivery, with syllabuses and reading lists given to students, online support between courses and feedback on assignments.
- Seminars, discussions and lectures led by a tutor with specialist knowledge in the content.
- Guest lectures and seminars presented by leaders in the field.
- Personal study guided by appropriate syllabuses, reading lists and resources provided by the Tutor.
- Full and appropriate use of the programme's virtual learning environment (VLE) and one-to-one MSt supervisions provided both online and face-to-face.
- For the MSt, advice on formulating a viable research question, topic and appropriate methodology and one-to-one supervisions on research related to formulating and conducting a project, structuring and writing a dissertation.

Assessment methods

- 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 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 be 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

As for all the University's MSt programmes, the Institute of Continuing Education's Registry is the approved Admitting Body and Administering Body; the ICE Registry also undertakes this role for part-time Postgraduate Certificate and Postgraduate Diploma.

1. Applicants are normally expected to a hold a 2i degree or higher from a UK university or an equivalent from an overseas university.

2. All applicants are required to demonstrate competency in English at a high level before commencing the programme (IELTS Academic test scores of: overall band score of 7.0, with not less than 7.0 in speaking, listening and writing, and 6.5 in reading). Evidence of competency in English is in accordance with the guidelines of the University of Cambridge.
3. Short term study Visas, and those in full-time employment, whether in the UK or abroad, to work and study at the same time.

Student support

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 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

The majority of part-time students will already be in full or part-time clinical employment and will take the course for reasons of professional and career development and advancement, for personal development, or to enhance their skills and knowledge. The majority of full-time students (see MPhil in genomic medicine) have proceeded to PhD studentships or graduate entry medicine courses.