Programme Specification

1. Programme title	MSc Medical Genomics
2. Awarding institution	Middlesex University
3. Teaching institution	*Middlesex University*
4. Details of accreditation by professional/statutory/regulatory body	
5. Final qualification	MSc Medical Genomics
6. Year of validation **Year of amendment**	2019
7. Language of study	English
8. Mode of study	Full-time (One year)

9. Criteria for admission to the programme

Evidence of capacity to work at level 6.
A degree of at least a lower second in Biological or Biomedical Sciences or related subject. Students may be accepted with prior learning and should contact the programme leader to discuss this before apply.

Overseas candidates must also be competent in English to study this course. The most commonly accepted evidence of English language ability is IELTS 6.5 (with minimum 6.0 in all four components)

The programme is open to students with disabilities
Students who have a disability are welcome to contact the programme leader prior to applications to discuss any specific needs.

10. Aims of the programme

The course is designed to meet academic, professional and employment needs. It develops the range of academic, vocational and transferrable skills associated with genomics.

The programme aims to produce graduates that:

- Are trained to pursue a career in the emerging field of medical genomics

- Can design and implement innovative and cost-effective genomics experiments tailored to specific biomedical, diagnostic or clinical needs.

- Have a comprehensive understanding of genomic processes at the molecular and population level, including the population genomics of human and infectious disease and the control of gene expression in relation to medical conditions.

- Have the skills to analyse genomics datasets in a thorough manner and effectively communicate outcomes to people from other disciplines when working in a multidisciplinary team.

- Are aware of the ethical and legal requirements in genomics research and the social issues related to it.

- Have a thorough overview and understanding of currently available genomics technologies in medical research and molecular diagnostics.

11. Programme outcomes*

Knowledge and understanding On completion of this programme the successful student will have knowledge and understanding of: 1. Genome structure and function in humans and organisms of medical importance 2. Population genomics of human and infectious disease 3. Analytical methods for disease risk assessment 4. Experimental design and statistical approaches for whole-genome research. 5. Genomics technologies in medical research and diagnostics. 6. Ethical and legal issues in medical genomics 7. Good laboratory and computing practices Ability to fully meet this PLO will be dependent on Covid-19 restrictions in place with regard to lab access. If lab access is restricted, students will be supported to demonstrate knowledge of how to meet this PLO 8. Computing principles for handling large genomics datasets	**Teaching/learning methods** Students gain knowledge and understanding through a strong focus on practice based learning. Lectures are accompanied by sessions and seminars that focus on the generation, handling and analyses of real-life datasets. Teaching will take place either online or by face to face teaching on campus, COVID-19 permitting **Assessment methods** Students' knowledge and understanding is assessed by: - A diverse set of assessments that include data interpretation exercises, examination, an oral and poster presentation, a scientific paper and a research grant proposal. - An independent genomics research project.
B. Skills On completion of this programme the successful student will be able to:	**Teaching/learning methods** Students learn cognitive skills through

1. Apply laboratory techniques to genomics research, including sample preparation, quality control and sequencing. 2. Use their research skills to process genomics datasets whilst, for example, making use of computational resources, digital platforms and computer coding 3. Present creative solutions to analyse and visualise complex datasets. 4. Efficiently work in a team and effectively communicate experimental results and outcomes to others 5. Use their critical thinking skills to put results into the context of existing work and the wider scientific literature	- Case study analysis, including discussions of influential scientific papers - *In-silico* data analysis of authentic datasets - Essay writing - Problem-solving worksheets supporting theoretical concepts - Experimental work in support of genomics research - Independent research projects - Electronic resources supplementing teaching and learning. **Assessment methods** Students' cognitive skills are assessed by a combination of formative and summative assignments

12. Programme structure (levels, modules, credits and progression requirements)

12. 1 Overall structure of the programme

The programme operates over 12 months and students will study over a 3 term year October to October. There are breaks at Christmas and Easter. Assessments are carried out throughout the year in all terms.

The programme is divided into study units called modules with a credit value of 15, 30 or 60 credits. Each credit equates to approximately 10 hours of learning so that a 15 credit module equates to 150 hours of learning.

To obtain the Masters award, student will need to complete 120 taught credits and 60 credits of dissertation, 180 credits in total. Students who have obtained 120 credits may exit with a Post Graduate Diploma in Genomics.

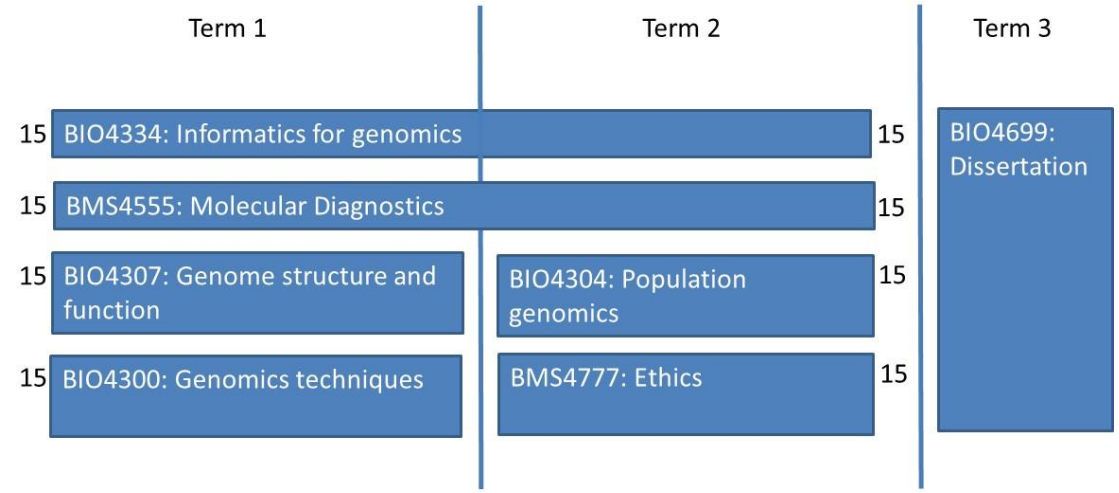
Students undertake an individual dissertation in the 3rd semester

12.2 Levels and modules		
Level 7		
COMPULSORY	OPTIONAL	PROGRESSION REQUIREMENTS
Students must take all of the following: BIO4334 BIO4307 BIO4304 BMS4777 BIO4300 BMS4357 BIO4699	N/A	

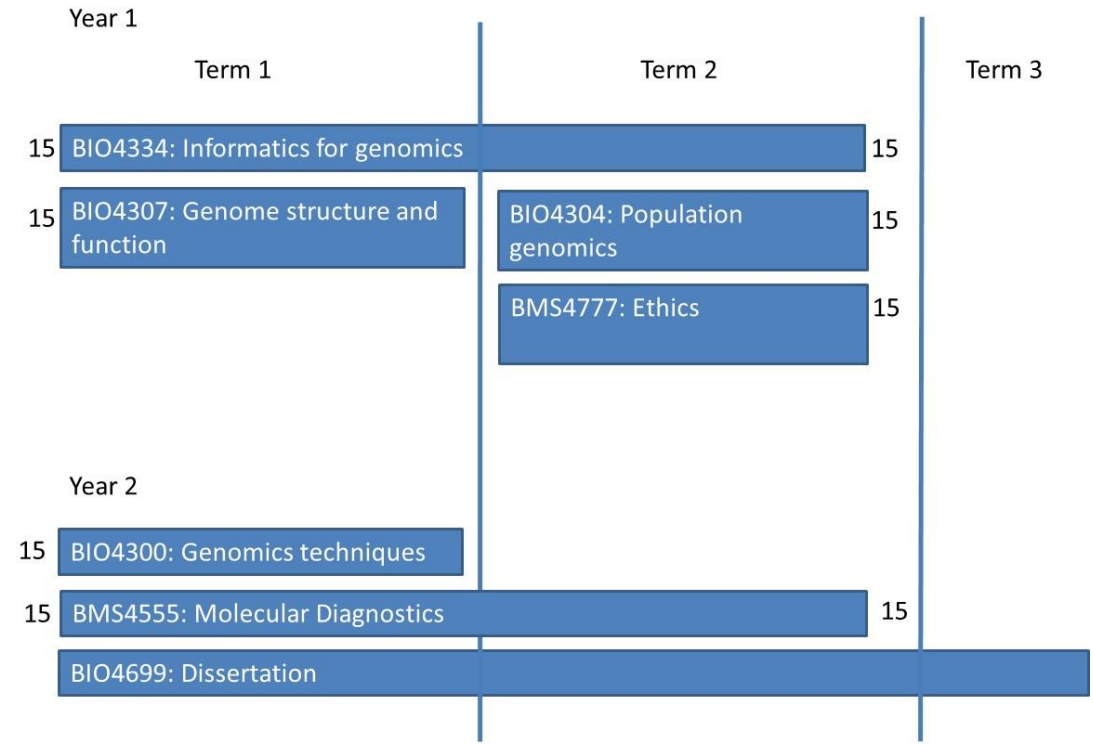
12.3 Non-compensatable modules (note statement in 12.2 regarding FHEQ levels)	
Module level	**Module code**
7	BIO4334, BIO4307, BIO4304, BMS4777, BIO4300, BMS4357 BIO4699

13. Curriculum map

Full time:



Part time:



14. Information about assessment regulations

The regulations for assessment are common to the University and can be found at https://www.mdx.ac.uk/about-us/policies/university-regulations.
Each module has one or more pieces of assessment. A minimum of 40% is required on each piece of assessment to pass. Within modules, where there is more than one component to a module assessment, and all pieces of work are at pass grade, the marks are aggregated, and a grade given using the Middlesex University 20 point scale.
There are opportunities for re-assessment in failed components of work and specific details are given in the module handbooks. Where a student has failed a piece of work, the mark for the resubmitted work is capped at 40%.

Students must adhere to module assessment deadlines. Where a student cannot meet the deadline for extenuating reasons (for example illness, accidents, bereavement, family problems), an extension can be formally requested. Failure to participate in assessment without permission will result in a fail grade for the piece of assessment. Self-deferral is not permitted.

Students must complete and pass all assessment activities associated with each module. In order to participate in the assessment, they must attend all sessions associated with each module.

16. Future careers (if applicable)

Graduates of this programme will have a solid background in Medical Genomics. The field is fast developing and graduates with a specialisation in Medical Genomics can find work in: Academia or industry as a clinical trials or laboratory-based research assistant, bioinformatician or geneticist; Medical Diagnostics in a hospital-based laboratory setting; Personalised medicine or commercial personalised DNA analysis (e.g. ancestry services) as a bioinformatician, laboratory-based research assistant, ethical advisor or market research assistant. There are a number of key areas that are in need of researchers trained to do genome scale analyses, and with the recent announcement that the 100,000 genomes project is set to be extended to analyse 5 million genomes within 5 years, this demand is likely to increase exponentially.

17. Particular Support for Learning

Learning Resources on campus

Specialist external lecturers

Staff on the programme have active research links with various national and international institutions. Students who wish to do external placements for their dissertation will be supported in securing placements, subject to the appropriate risk assessment. All students will be able to complete their dissertation with the University if they do not secure an external placement.

18. JACS code (or other relevant coding system)

19. Relevant QAA subject benchmark group(s)

20. Reference points

Relevant multidisciplinary subject benchmarks: Biosciences (2014)
Middlesex University Learning and Quality Enhancement Handbook (LQEH) 2019.20
Middlesex University Regulations 2019.20
QAA, Characteristics Statements for Masters Degrees 2015

21. Other information

There are no additional costs associated with the programme.

Please note programme specifications provide a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably be expected to achieve if s/he takes full advantage of the learning opportunities that are provided. More detailed information about the programme can be found in the rest of your programme handbook and the university regulations.

Curriculum map for MSc Medical Genomics

This section shows the highest level at which programme outcomes are to be achieved by all graduates, and maps programme learning outcomes against the modules in which they are assessed.

Programme learning outcomes

Knowledge and understanding	
A1	Genome structure and function in humans and organisms of medical importance
A2	Population genomics of human and infectious disease
A3	Analytical methods for disease risk assessment
A4	Experimental design and statistical approaches for whole-genome research
A5	Genomics technologies in medical research and diagnostics.
A6	Ethical and legal issues in medical genomics
A7	Recognise good laboratory and computing practices
A8	Computing principles for handling large genomics datasets
Skills	
B1	Apply laboratory techniques to genomics research, including sample preparation, quality control and sequencing.
B2	Use research skills to process genomics datasets whilst, for example, making use of computational resources, digital platforms and computer coding
B3	Present creative solutions to analyse and visualise complex datasets.
B4	Efficiently work in a team and effectively communicate experimental results and outcomes to others
B5	Use critical thinking skills to put results into the context of existing work and the wider scientific literature

Programme outcomes														
A1	A2	A3	A4	A5	A6	A7	A8	B1	B2	B3	B4	B5		
Highest level achieved by all graduates														
7	7	7	7	7	7	7	7	7	7	7	7	7		

Module Title	Module Code by Level	A1	A2	A3	A4	A5	A6	A7	A8	B1	B2	B3	B4	B5		
Genome structure and function	BIO4307	X														
Genomics techniques	BIO4300			X		X		X	X	X		X				
Population genomics	BIO4304		X								X			X		
Informatics for genomics	BIO4334				X			X	X			X	X	X		
Molecular Diagnostics	BMS4357	X	X	X	X		X				X			X		
Ethics	BMS4777						X						X	X		
Dissertation	BIO4699				X		X				X	X		X		