

Programme Title: Genetics



## Programme Specification (UG)

Awarding body / institution:	Queen Mary University of London
Teaching institution:	Queen Mary University of London
Name of final award and programme title:	BSc (Hons) Genetics
Name of interim award(s):	
Duration of study / period of registration:	3 years
QMUL programme code / UCAS code(s):	UBSF-QMBIOL1, USGEN / C400
QAA Benchmark Group:	
FHEQ Level of Award :	Level 6
Programme accredited by:	
Date Programme Specification approved:	
Responsible School / Institute:	School of Biological & Chemical Sciences

Schools / Institutes which will also be involved in teaching part of the programme:

Barts and The London School of Medicine and Dentistry

Institution(s) other than QMUL that will provide some teaching for the programme:

BIO291 is taught in collaboration with the Field Studies Council (FSC) at their field station in Millport

### Programme outline

This programme provides training in the field of genetics. The programme is designed to provide an in-depth understanding of how measurable attributes (phenotypes) arise from inherited DNA sequences. It studies the three major types of genetics (inheritance patterns, population genetics, and molecular genetics) and provides a detailed analysis of how these impact on our understanding of evolution in a wide variety of organisms with an introduction to key principles of protein structure and function, the chemical sciences, cell biology, genetics and microbiology. Emphasis is given to molecular concepts of complex biological systems.

### Aims of the programme

This programme aims to provide a general foundation in biological sciences with a significant and balanced input of genetics training. Compulsory modules direct the students towards understanding of genetics in cell biology and development, evolutionary processes, speciation and genomics. It will also provide an environment to develop transferable skills in public speaking, verbal reasoning, report writing and database mining.

Furthermore to:

- Provide a rational, flexibly structured and coherent programme of study which is relevant to the needs of employers, facilitate the professional development of the student and lay the foundations for a successful career to the benefit of the economy and society;
- provide a sound knowledge base in the fields studied and develop key transferable skills in the areas of communication, numeracy, information technology, working with others, problem solving, time and task management;
- foster the development of an enquiring, open-minded and creative attitude, tempered with scientific discipline and social awareness, which encourages lifelong learning.

### **What will you be expected to achieve?**

You will be expected to achieve the following learning outcomes:

### **QMUL Model**

The QMUL Model is an innovative teaching and learning initiative that will broaden opportunities for Queen Mary undergraduates within and beyond higher education, supporting them to plan and manage their ongoing professional development. The Model is firmly grounded in the core QMUL values of respect for, and engagement with, the local area and communities, with a distinctive focus on enabling students to make a positive societal impact through leadership in their chosen field. The Model is organised around the key themes of:

- networking
- multi- and inter-disciplinarity
- international perspectives
- enterprising perspectives.

Students are required to study QMUL Model modules to the value of at least 10 credits at each year of undergraduate study. Model modules may be 5, 10 or 15 credits. Model modules are indicated within this programme specification.

In your first year of study, the Model module will be core or compulsory and will be situated within your home School or Institute. In subsequent years, students will be strongly encouraged to study at least one Model module beyond their home discipline(s), which could, for example, be in another School / Institute or area of QMUL or undertaken as a module outside of QMUL.

If Model module information is not provided on this programme specification for all subsequent years of study, this will be identified as your studies continue.

Where a Model module elective can be selected from an approved group of Model modules, no guarantee can be provided that your first choice of Model module will be available.

Academic Content:	
A 1	Key concepts in genetics, development and evolution
A 2	Evolutionary theory and how this is applied to the speciation, biosystematics and development
A 3	How an understanding of evolution can be derived from studies of interaction between populations, species and communities
A 4	Understanding of evolutionary genetics from the molecular perspective, derived from the disciplines of classical, chromosomal, population and molecular genetics.

Disciplinary Skills - able to:	
B 1	Reason critically.
B 2	Identify and formulate problems.
B 3	Apply biological and genetics knowledge and principles, in combination with problem-solving skills, in a wide range of theoretical and practical situations.
B 4	Use advanced theories and concepts to explain/rationalize phenomena in genetics, and to investigate unfamiliar problems.
B 5	Conduct practical work efficiently and with due regard for safety.
B 6	Use a wide range of laboratory and analytical equipment, as well as computational tools and packages.
B 7	Analyse and evaluate/interpret the results of controlled experiments
B 8	Retrieve, filter and collate biological and genetics data from a variety of information sources.
B 9	Prepare scientific/technical reports.
B 10	Plan, undertake and report a bibliographically-based piece of research.

Attributes:	
C 1	Communicate effectively by written and/or verbal means.
C 2	Capacity for independent learning, and to work independently.
C 3	Able to participate constructively as a member of a group/team, with skills to influence, negotiate and lead.
C 4	Assess the relevance, importance and reliability of the ideas of others and different sources of information.

Programme Title: Genetics

C5	Competent in the use of computer-based technology, including the manipulation and analysis of quantitative data.
C6	Awareness of the role and impact of science in society, including the global perspective.
C7	Use information for evidence-based decision-making and creative thinking.

QMUL Model Learning Outcomes - Level 4:

D1	Identify and discuss their own career aspirations or enterprise skills and knowledge and how they impact on others
D2	Identify and demonstrate the perspectives or problem solving techniques of different disciplines
D3	Consider the role of their discipline in diverse cultural and global contexts

QMUL Model Learning Outcomes - Level 5:

E1	
----	--

QMUL Model Learning Outcomes - Level 6:

E1	
----	--

QMUL Model Learning Outcomes - Level 7:

G1	
----	--

**How will you learn?**

Acquisition of knowledge is achieved mainly through lectures and directed independent learning. Understanding is reinforced through a combination of tutorial workshops, problem classes and laboratory classes (depending upon the module concerned), including regular feedback on submitted work. Additional learning support is provided through Queen Mary's online learning environment and the facilities of the QMUL Student PC Service.

### How will you be assessed?

Testing of the knowledge base is generally through a combination of unseen written examinations and assessed coursework. The exact nature of the coursework varies from module to module and may include work in the form of laboratory experiment write-ups, essays and/or problem sheets. The coursework mark may also include a contribution from computer-based assessments and in-course tests. Specific modules (if taken) include assessed oral examinations, oral presentations and extended reports/dissertations.

### How is the programme structured?

Please specify the full time and part time programme diets (if applicable). Please also outline the QMUL Model arrangements for each year of study. The description should be sufficiently detailed to fully define the structure of the diet.

Students are required to register for modules to a value of 120 credits in each academic year. These modules are chosen from those offered in the C400 programme diet, as detailed below.

In the first year, you will study 120 credits, comprising the following:

- 6 x 15 credit compulsory modules (totalling 90 credits, across Semesters A & B)
- 3 x 10 credit compulsory modules (totalling 30 credits, across Semesters A & B)

In the second year, you will study 120 credits, comprising the following:

- 2 x 15 credit compulsory modules, BIO223 Genes & Bioinformatics, and BIO221 Evolutionary Genetics (totalling 30 credits, Semester A)
- 2 x 15 credit compulsory modules, BIO241 Transmission Genetics, and BIO209 Research methods and communication (totalling 30 credits, Semester B)
- 3 x 15 credit elective modules from the discipline elective group (totalling 45 credits, across Semesters A & B)
- 1 x 15 credit elective module from the compulsory Model elective group (15 credits, Semester A)

In third year, you will study 120 credits comprising the following:

- 1 x 30 credit compulsory elective module from the Research Project group (30 credits, across Semesters A & B)
- 2 x 15 credit compulsory modules, BIO309 Research methods and communication II, and BIO325 Population & Chromosome Genetics (totalling 30 credits, Semester A)
- 1 x 15 credit compulsory module, BIO327 Functional Genomics & Epigenetics (15 credits, Semester B)
- 3 x 15 credit elective modules from the discipline elective group (totalling 45 credits, across Semester A & B).

Choice between electives is generally unrestricted, but with the exceptions that:

- you must not register for more than 75 credits in total in any given semester
- you must check that you satisfy the prerequisites before registering for any elective module
- you must register for one elective in the Model electives group in the second year. Model electives offered in other academic disciplines are available subject to a satisfactory timetable.
- you must register for one of BIO600 or BIO603 in the final year.

Academic Year of Study    FT - Year 1

Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester	QMUL Model
--------------	-------------	---------	-------	-------------------------	------------------------	----------	------------

Programme Title: Genetics

Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester	QMUL Model
Practical Molecular & Cellular Biology	BIO192	10	4	Compulsory	1	Semester 1	<input type="checkbox"/> No
Cell Biology	BIO111	15	4	Compulsory	1	Semester 1	<input type="checkbox"/> No
Evolution	BIO113	15	4	Compulsory	1	Semester 1	<input type="checkbox"/> No
Molecular Genetics	BIO163	15	4	Compulsory	1	Semester 1	<input type="checkbox"/> No
Essential Skills for Biology	BIO100	10	4	Compulsory	1	Semesters 1 & 2	<input type="checkbox"/> Yes
Practical Biology	BIO190	10	4	Compulsory	1	Semester 2	<input type="checkbox"/> No
Physiology	BIO125	15	4	Compulsory	1	Semester 2	<input type="checkbox"/> No
Ecology	BIO123	15	4	Compulsory	1	Semester 2	<input type="checkbox"/> No
Basic Biochemistry	BIO161	15	4	Compulsory	1	Semester 2	<input type="checkbox"/> No

Academic Year of Study FT - Year 2

Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester	QMUL Model
Genes and bioinformatics	BIO223	15	5	Compulsory	2	Semester 1	<input type="checkbox"/> No
Evolutionary genetics	BIO221	15	5	Compulsory	2	Semester 1	<input type="checkbox"/> No
Transmission genetics	BIO241	15	5	Compulsory	2	Semester 2	<input type="checkbox"/> No
Cell biology and developmental genetics	BIO213	15	5	Elective	2	Semester 1	<input type="checkbox"/> No
Comparative and Integrative Physiology	BIO215	15	5	Elective	2	Semester 1	<input type="checkbox"/> No
Animal and Plant Diversity	BIO211	15	5	Elective	2	Semester 1	<input type="checkbox"/> No

Programme Title: Genetics

Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester	QMUL Model
Human Genetic Disorders	BIO227	15	5	Elective	2	Semester 1	<input type="checkbox"/> No
Ecological Interactions II	BIO294	15	5	Elective	2	Semester 2	<input type="checkbox"/> No
Marine and Animal Diversity	BIO291	15	5	Elective	2	Semester 3	<input type="checkbox"/> No
Research methods and communication	BIO209	15	5	Compulsory	2	Semester 2	<input type="checkbox"/> No
Microbial physiology and growth	BIO231	15	5	Elective	2	Semester 2	<input type="checkbox"/> No
Metabolic pathways	BIO265	15	5	Elective	2	Semester 2	<input type="checkbox"/> No
Membrane & cellular biochemistry	BIO263	15	5	Elective	2	Semester 2	<input type="checkbox"/> No
Introduction to Scientific Programming (15 credits)	SBC5291	15	5	Elective	2	Semester 1	<input type="checkbox"/> Yes
Health & Wellbeing (15 credits)	SBC5215	15	5	Elective	2	Semesters 1 & 2	<input type="checkbox"/> Yes
Philosophy of Business & Science (15 credits)	SBC5221	15	5	Elective	2	Semester 1	<input type="checkbox"/> Yes
Grand Challenges in the Natural Sciences (15 credits)	SBC5211	15	5	Elective	2	Semester 1	<input type="checkbox"/> Yes
Engaging the Public in Science (15 credits)	SMD5251	15	5	Elective	2	Semesters 1 & 2	<input type="checkbox"/> Yes
External (pool) Model module electives TBA	Various, TBA	15	5	Elective	2	Semester 1	<input type="checkbox"/> Yes
Ecological Interactions I	BIO234	15	5	Elective	2	Semester 2	<input type="checkbox"/> No

Academic Year of Study FT - Year 3

Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester	QMUL Model
Research methods and communication II	BIO309	15	6	Compulsory	3	Semester 1	<input type="checkbox"/> No

Programme Title: Genetics

Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester	QMUL Model
Biological Science Research Project	BIO600	30	6	Elective	3	Semesters 1 & 2	<input type="checkbox"/> Yes
Project skills in the life sciences	BIO603	30	6	Elective	3	Semesters 1 & 2	<input type="checkbox"/> Yes
Behavioural Ecology	BIO311	15	6	Elective	3	Semester 1	<input type="checkbox"/> No
Human genetics and genomics	BIO323	15	6	Elective	3	Semester 1	<input type="checkbox"/> No
Ecological and Evolutionary Genomics	BIO321	15	6	Elective	3	Semester 1	<input type="checkbox"/> No
Population and chromosome and genetics	BIO325	15	6	Compulsory	3	Semester 1	<input type="checkbox"/> No
Species: Dinosaurs to DNA	BIO395	15	6	Elective	3	Semester 1	<input type="checkbox"/> No
Functional genomics and epigenetics	BIO327	15	6	Compulsory	3	Semester 2	<input type="checkbox"/> No
Neuroscience: from molecules to behaviour	BIO333	15	6	Elective	3	Semester 2	<input type="checkbox"/> No
Mammals and evolution	BIO331	15	6	Elective	3	Semester 2	<input type="checkbox"/> No
Reproductive and Developmental Biology	BIO337	15	6	Elective	3	Semester 2	<input type="checkbox"/> No
Environmental Microbiology	BIO341	15	6	Elective	3	Semester 2	<input type="checkbox"/> No
Parasites and infectious disease	BIO335	15	6	Elective	3	Semester 2	<input type="checkbox"/> No
Behavioural ecology	BIO311	15	6	Elective	3	Semester 2	<input type="checkbox"/> No
Tropical ecology and conservation	BIO391	15	6	Elective	3	Semester 3	<input type="checkbox"/> No

### What are the entry requirements?

Candidates must be able to satisfy the general admissions requirements of the University and meet the requirements for this specific programme of study. This is usually achieved in one of the following ways (note - the entry-points tariff is subject to annual review):

For direct entry to the degree programme, candidates must usually possess ABB at A2 level including "A2" Biology, or equivalent qualifications.

or via



Admission to the QMUL Science and Engineering Foundation Programme (SEFP), and successful completion of the foundation year (defined by achievement of the minimum requirements for progression defined in the SEFP programme regulations, and the criteria specified in the SEFP Student Handbook for progression to this particular degree programme).

### **How will the quality of the programme be managed and enhanced?**

Quality of the programme will be managed and enhanced through institutional and School level reviews. These will take the form of the Annual Programme Review, Programme Teaching Groups, and Teaching and Learning Committee. Additionally, student feedback (via SSLC and Module Evaluations) will be considered when developing modules and programmes.

### **How do we listen to and act on your feedback?**

The Student-Staff Liaison Committee (SSLC) provides a formal means of communication and discussion between the School and its students. The committee consists of student representatives from each year in the School, together with appropriate representation from staff within the School. It is designed to respond to the needs of students, as well as act as a forum for discussing programme and module developments. The Student-Staff Liaison Committees meets regularly throughout the year.

The Teaching & Learning Committee advises the School's Director of Taught Programmes on all matters relating to the delivery of taught programmes at school level, including monitoring the application of relevant QM policies and reviewing proposals for module and programme approval and amendment before submission to Taught Programmes Board. Student views are incorporated in the committee's work in a number of ways, such as through consideration of student surveys and input from the SSLC.

All schools/institutes operate an Annual Programme Review of their taught undergraduate and postgraduate provision. APR is a continuous process of reflection and action planning which is owned by those responsible for programme delivery; the main document of reference for this process is the Taught Programmes Action Plan (TPAP) which is the summary of the school/institute's work throughout the year to monitor academic standards and to improve the student experience. Students' views are considered in this process through analysis of the NSS and module evaluations.

### **What academic support is available?**

Each student is provided with a personal academic guidance tutor (or "advisor") who is their main point of contact for advice regarding academic matters and for assistance with pastoral concerns, throughout their whole programme. Students can see their advisors in their office hours or arrange an appointment via email. Moreover, if and when advisors are unavailable or cannot help with a specific problem, the School has several Senior Advisors to assist with student concerns.

The School also operates a PASS programme for peer guidance.

### **Programme-specific rules and facts**

Not applicable.

--

### Specific support for disabled students

Queen Mary has a central Disability and Dyslexia Service (DDS) that offers support for all students with disabilities, specific learning difficulties and mental health issues. The DDS supports all Queen Mary students: full-time, part-time, undergraduate, postgraduate, UK and international at all campuses and all sites.

Students can access advice, guidance and support in the following areas:

- Finding out if you have a specific learning difficulty like dyslexia
- Applying for funding through the Disabled Students' Allowance (DSA)
- Arranging DSA assessments of need
- Special arrangements in examinations
- Accessing loaned equipment (e.g. digital recorders)
- Specialist one-to-one "study skills" tuition
- Ensuring access to course materials in alternative formats (e.g. Braille)
- Providing educational support workers (e.g. note-takers, readers, library assistants)
- Mentoring support for students with mental health issues and conditions on the autistic spectrum.

### Links with employers, placement opportunities and transferable skills

Half our graduates find work or further training in the life sciences including teaching, research or environmental monitoring and regulation, sales work and careers in the growing biotechnology industry. The remaining half move on to other jobs or further training but take transferable skills from a scientific education: numeracy, computer literacy, data handling and analysis, descriptive and critical writing, familiarity with biotechnology and scientific methods.

Recent graduate roles include:

laboratory technician,  
data analyst,  
public health officer,  
market researcher.  
NHS administrator,  
medical representative,  
environmental consultant.

---

## Programme Specification Approval

**Person completing Programme Specification:**

Dr David Hone
---------------

**Person responsible for management of programme:**

Dr David Hone
---------------

**Date Programme Specification produced / amended by School / Institute Learning and Teaching Committee:**

24 Jan 2018
-------------

**Date Programme Specification approved by Taught Programmes Board:**

--