MICROBIOLOGY

Microbiology is the study of bacteria, fungi, algae, protozoa and viruses, and is of immense importance in relation to the environment, agriculture and food, biomedical sciences and biotechnology.

Graduates in microbiology are therefore highly sought after in these fields. Microbiology is very central to many aspects of the biological sciences, from pure research to diverse industrial, medical and environmental applications.

Microorganisms play major roles in the diseases of man, animals and plants. Microbiologists have been central to their diagnosis and in combating such diseases through the discovery of effective therapies.Microorganisms also play a central role in the biosphere, through global environmental processes and recycling of elements and waste products. In biotechnology and synthetic biology, microbes are also crucial in the manufacture of beverages, pharmaceuticals, biofuels and many other useful products.

COURSE CONTENT

Microbiology provides fundamental training in data analysis, problem solving, teamwork and communication. Microbiologists can use these skills in a wide range of careers in research, medicine, industry, education, business and communications, or as a route to further study.

The modules are:

Stage 1

- Molecular Basis of Life
- Fundamentals of Chemistry (optional)
- Structure, Reactivity and Mechanism in Organic and Bioorganic Chemistry (optional)
- The World of Microorganisms
- Biodiversity (optional)
- Ecology and Environmental Science (optional)

Stage 2

- Experimental Biochemistry (optional)
- Cell Biology 2
- Molecular Genetics and Bioinformatics
- Microorganisms in Action (optional)
- Plant and Rhizosphere Interactions (optional)
- Work Placement (optional)

Work Placement

- Microbiology students can complete a 16-week degree-related work placement
- Microbiology with Professional Studies students will complete a one-year, degree-related work placement

Stage 3

- Industrial Microbiology (optional)
- Medical Microbiology (optional)
- Parasitology
- Zoonoses
- Bacterial Genetics and Genetic Manipulation
- Research Project (BSc programmes only)

- **Stage 4** (MSci Students only)

- Research Project

WHY QUEEN'S?

Professional Accreditation

The BSc Microbiology and BSc Microbiology with Professional Studies have been accredited by the Royal Society of Biology following an independent and rigorous assessment. Accredited degree programmes contain a strong academic foundation in biological knowledge and key skills, and prepare graduates to address the needs of employers.

The MSci Microbiology and MSci Microbiology with Professional Studies hold advanced accreditation with the Royal Society of Biology. Advanced Degree Accreditation by the Society recognises academic excellence in the biosciences, and highlights degrees that educate the research and development leaders and innovators of the future.

Work Placement

Work placements on these programmes provide students with the opportunity

BSc Honours

Microbiology 3 yrs (C500)

Microbiology with Professional Studies *4-yr SW (C504)*

MSci

Honours Microbiology *4 yrs (C502)*

Microbiology with Professional Studies *5-yr SW (C505)*

See also Biochemistry, Biological Science, Marine Biology and Zoology

Entrance Requirements

BSc

A-level:

BBB including Biology and at least one from Chemistry (preferred), Geography, Mathematics or Physics + GCSE Chemistry grade B/6 or GCSE Double Award Science grades BB/66 + GCSE Mathematics grade C/4

OR

BBB including Double Award Applied Science or Double Award Life and Health Sciences + GCSE Biology grade C/4 and Chemistry grade B/6 or GCSE Double Award Science grades BB/66 + GCSE Mathematics grade C/4

OR

ABB including Biology + GCSE Chemistry grade B/6 or GCSE Double Award Science grades BB/66 + GCSE Mathematics grade C/4.

MSci

A-level:

AAB including Biology and at least one from Chemistry (preferred), Geography, Mathematics or Physics + GCSE Chemistry grade B/6 or GCSE Double Award Science grades BB/66 + GCSE Mathematics grade C/4

OR

AAB including Double Award Applied Science or Double Award Life and Health Sciences + GCSE Biology grade C/4 and Chemistry grade B/6 or GCSE Double Award Science grades BB/66 + GCSE Mathematics grade C/4

OR

AAA including Biology + GCSE Chemistry grade B/6 or GCSE Double Award Science grades BB/66 + GCSE Mathematics grade C/4.

Note: MSci applicants will automatically be considered for admission to the BSc if they are not eligible for entry to the MSci, both at initial offer-making stage and when results are received.

For students whose first language is not English

An IELTS score of 6.5 with a minimum of 5.5 in each test component or an equivalent acceptable qualification, details of which are available at: **go.qub.ac.uk/EnglishLanguageReqs**

to utilise the practical skills gained during the teaching of their degree and apply these in a work environment.

Past students have gained work placement with organisations such as Northern Ireland Water Ltd, the Northern Ireland Environment Agency, the Forensic Science Service, the NHS, Norbrook Laboratories, Randox Laboratories, the Almac Group, and Moy Park.

CAREERS/FURTHER STUDY

Microbiology is an interdisciplinary subject with key links to the other Biological Sciences, Biochemistry, Chemistry, Environmental Engineering and Medicine.

Graduates are qualified to take up both scientific and non-scientific careers.

Many job opportunities are available in biomedical, industrial and government organisations, and in universities and colleges of higher education.

These jobs cover innovative research, the development of new products, advisory and consultancy work or teaching. All are aimed at improving the health, environment and economy of countries in both the developed and developing world. In particular, companies and organisations concerned with animal and plant health, food and beverage processing, water quality, environmental management, pharmaceutical products and biotechnology require graduates in microbiology.

Job opportunities exist across a number of areas including:

- **Healthcare:** Microbiologists are essential in the fight against infectious diseases working in hospitals and Health Protection Laboratories. Here they diagnose infections, monitor treatments, develop vaccines, provide advice or track disease outbreaks.
- **Basic research:** In order to either solve the problems caused by microorganisms or exploit their capabilities fundamental research on their biochemistry and genetics is required. Many microbiologists work in universities and research institutes exploring the detailed workings of microbial cells.
- **Environment:** One of the greatest challenges currently facing society is that of climate change and environmental protection. Microbiologists are key players in the development of waste treatment technologies, recycling processes, pollution warning systems and in the production of green energy.
- **Agriculture:** Pest management is an essential component of modern agricultural practice.
- Microbiologists have key roles to play in the development of pest control systems and in the diagnosis and treatment of animal pathogens.
- **Business:** Microbiologists work in many bioscience and food companies, carrying out research, developing new products or carrying out quality control of manufacturing processes to ensure the microbiological safety of goods such as medicines, cosmetics, food, drink etc.
- **Outside the lab:** Many trained microbiologists never go on to work in the microbiology field. However, they can use their skills and knowledge to pursue careers in marketing, technical support, regulatory affairs, education, as patent attorneys, and in public relations, journalism and publishing.

Employer Links

The School of Biological Sciences employs a dedicated careers adviser who has developed an extensive portfolio of employers, both nationally and internationally, within the science sector. Advice is also provided on CV preparation, interview techniques and securing summer work or longer placements. Students and graduates have secured placements and jobs with:

- Northern Ireland Water Ltd
- Environment Agency
- Forensic Service
- Moy Park
- Randox Laboratories
- Norbrook Laboratories Ltd
- The Almac Group
- Health Service

Further Study

Further study is also an option open to microbiology graduates. Students can choose from a wide range of Master's programmes as well as a comprehensive list of research topics as shown on the School website.

This course at Queen's offers a unique opportunity for students to study Microbiology in the context of medicine, environmental protection and biotechnology.

94% of Queen's Microbiology students are satisfied with their course, ranking us joint 3rd in the UK.

(National Student Survey 2017)

Royal Society of Biology
Advanced Accredited Degree

Royal Society of Biology
Accredited Degree

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