Course Specification

HLST180 MSc Biotechnology
Part A
Faculty of Health and Life Sciences
School of Life Sciences
Academic Year 2018-19

Please note: This specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if s/he takes full advantage of the learning opportunities that are provided.

We regularly review our course content, to make it relevant and current for the benefit of our students. For these reasons, course modules may be updated.

More detailed information on the learning outcomes, content, and teaching, learning and assessment methods of each module can be found in the Module Information Directory (MID), student module guide(s) and the course handbook.

The accuracy of the information contained in this document is reviewed by the University and may be verified by the Quality Assurance Agency for Higher Education.
PART A Course Specification
HLST180 MSc Biotechnology

1. Introduction

Biotechnology uses living microbes, cells, and materials produced by cells, to create pharmaceutical, diagnostic, agricultural, environmental and other products. The ability to manipulate DNA sequences has led to key advances in molecular biotechnology, including the ability to alter genetic information in animals and plants to enhance their genetic traits for the benefits of mankind. However, these advances also bring with them ethical, legal and sociological dilemmas. Biotechnology is the most rapidly growing sector in life sciences industries and it is predicted that global expansion in areas of industrial biotechnology, renewable energy, remediation of contaminated material, food production and pharmaceutical production will be a key driver of the world economy in the foreseeable future. Consequently, this MSc Biotechnology course is designed to provide the preparation and development necessary across multiple biotechnology topic areas to meet the needs of the growing number of employers within the very wide ranging biotechnology sector.

Coventry University is renowned for the applied and vocational orientation of its courses ensuring that graduates are not only knowledgeable about their subject, but also competent and confident to enter the workplace. MSc Biotechnology seeks to give students a clear understanding of the processes and challenges of several key aspects of modern biotechnology, combined with laboratory expertise and skills in analysis and communication of scientific research, plus an appreciation of ethical and legal issues. It provides access to this specialised discipline for students from a wide variety of bioscience backgrounds worldwide. The course aims to encourage students to explore areas relevant to their own career aspirations, biotechnological challenges in their home country and/or their personal interests, alongside the taught material.

Practical laboratory experience is a substantial component of the course, facilitated by our exceptional laboratory facilities. Our new Science and Health Building (SHB) opened in 2017. The building incorporates a modern, state of the art “Super-Lab”, a separate analytical chemistry suite and research laboratories, equipped with high specification molecular biology, cell culture and analytical equipment. Students are supported to develop their competence and independence in the laboratory, through initial taught sessions, through to group based projects and finally, their own independent research investigation, guided by academic and experienced technical staff. Teaching and learning is supported by digital platforms and alternative teaching methods which are research led, including journal clubs, lab meetings and poster presentations. The aim is to produce scientists who will be able to contribute to a range of careers in industrial, commercial, environmental or health based biotechnology sectors. The course also provides an excellent foundation for those wishing to pursue a research career in biotechnology by PhD study.

Another innovative feature of the course is the inclusion of a module focussed on Professional Development; specifically creativity and innovation. This module enables students to understand and apply business management principles in problem based scenarios. The Biotechnology sector has benefitted from numerous start up companies and many small to medium enterprises, as well as the established multinational companies, and understanding business approaches will be highly valuable for future career development. This module is accredited by the Chartered Management Institute (CMI) and students who successfully complete the module and meet CMI evidence requirements will gain a Level 7 certificate in Strategic Management and Leadership and a Level 7 award in Professional Consulting.
Biotechnology is an applied subject and students need to be aware of both the global and the commercial contexts, allied to a deep knowledge of the literature, so as to be able to devise creative solutions to current and future problems, whether in academic research or commercial environments. Biotechnology is a fast moving field, with many employment opportunities, and this course has been designed to support students to be able to evidence and demonstrate the skills, competencies and flexibility necessary for a fulfilling career in this sector.
## 2 Available Award(s) and Modes of Study

<table>
<thead>
<tr>
<th>Title of Award</th>
<th>Mode of attendance</th>
<th>UCAS Code</th>
<th>FHEQ Level</th>
</tr>
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<tbody>
<tr>
<td>MSc Biotechnology (HLST180)</td>
<td>3 semesters F/T</td>
<td>N/A</td>
<td>Level 7</td>
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<tr>
<td>MSc Biotechnology (HLST180)</td>
<td>6 semesters P/T</td>
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<td>Fall back awards:</td>
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<tr>
<td>PgD Biotechnology</td>
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<tr>
<td>PgC Biotechnology</td>
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</table>

### 3 Awarding Institution/Body

Coventry University.

### 4 Collaboration

None.

### 5 Teaching Institution and Location of delivery

Coventry University, Faculty of Health and Life Sciences.

Coventry University Main Campus.

### 6 Internal Approval/Review Dates

Latest review: 03/2018.

Date for next review: Academic year 2023/24

### 7 Course Accredited by

Not applicable

### 8 Accreditation Date and Duration

N/A

### 9 QAA Subject Benchmark Statement(s) and/or other external factors

There are no subject specific benchmark statement for an MSc award in Biotechnology or related subjects. However this course conforms with the QAA Characteristic Statements for a Specialised or Advanced Study Masters programme


and the FHEQ Qualification Descriptors for a Level 7 award


In addition, the course has been mapped to the accreditation criteria for the Royal Society for Biology


### 10 Date of Course Specification

March 2018
| **Course Director** | Dr Tim Aldsworth |
12 Outline and Educational Aims of the Course

MSc Biotechnology provide students with the opportunity to develop their skills and in-depth expertise in biotechnology as they transition towards becoming independent professional laboratory scientists within industry or academia.

The course will involve the critical evaluation, interpretation and communication of scientific data. Students will have significant opportunities to learn, practice and develop independent practical laboratory skills, and apply their knowledge and skills to an independent research project in the final semester.

The course involves a range of modules that address the scientific advances that have led to a broad range of modern biotechnology applications. Students develop problem solving abilities, blending theoretical and practical knowledge to analyse complex, and sometimes incomplete data. In addition they gain additional skills and qualifications in strategic management through the CMI associated Global Professional Development module.

The key educational aims of the Masters degree are therefore to:

1. Develop in learners a critical awareness of advances at the forefront of biotechnology.
2. Offer rigorous training and practice in the research, analytical, evaluative and presentation skills valued in an independent professional laboratory scientist specialising in biotechnology.
3. Enhance students’ appreciation of the academic, global, and commercial contexts to biotechnology to enhance their creativity, employability and mobility.
4. Enable students to work independently and use initiative to solve creatively the diverse problems that they may encounter in both academic and commercial biotechnology environments.
5. Enhance students’ ability to understand principles of management, leadership and consultancy and their relevance to biotechnology industries.

13 Course Learning Outcomes

At the end of the course a student should be able to:

1. Demonstrate an understanding of a number of aspects of biotechnology and apply knowledge to problem based scenarios
2. Critically analyse and synthesise scientific information in the subject area of biotechnology and articulate and present this effectively, through written, oral and digital formats, to a diverse and global audience
3. Competently undertake laboratory work using a wide range of biotechnological techniques and analyse resulting data effectively
4. Work effectively within a team and demonstrate creativity and leadership skills
5. Demonstrate an independent approach to learning, reflect on their own practice and take responsibility for personal development
6. Demonstrate knowledge and understanding of the principles of consultancy and organisational change and the theories and practices of strategic leadership
7. Devise, carry out and report an independent hypothesis-driven biotechnology based research project, with due regard to health and safety and ethical requirements
14 Course Structure and Requirements, Levels, Modules, Credits and Awards

MSc Biotechnology is available as a full time course with 180 credits taken over one year (3 semesters). There are currently 2 intakes per academic year, in September and January. Whilst there are no bespoke day release options for part time study, students may elect to take less than 180 credits in an academic year and spread the course over 2 years. However, this option requires students to start in September and to study some modules with the September intakes and some with the January intakes over the two years.

MSc Biotechnology with Professional Experience (HLST181) is a 5 semester course also offered by the School of Life Sciences. It should be noted however that students who enrol on MSc Biotechnology (HLST180) are not able to transfer to HLST181. Equally, students enrolled on MSc Biotechnology with Professional Experience (HLST181) are not normally permitted to transfer to HLST180.

PgD Biotechnology and PgC Biotechnology are available as fall back awards only.

All modules on the course are mandatory. The modules are detailed in Table14.1

The sequence of study for each route is shown in Table 14.2.

Table 14.1. MSc Biotechnology (3 semesters)

<table>
<thead>
<tr>
<th>Module credit level</th>
<th>Module Code</th>
<th>Title</th>
<th>Learning Credit Value</th>
<th>Assessment Credit Value</th>
<th>Mandatory/Optional</th>
<th>Course Learning Outcomes</th>
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<tr>
<td>7</td>
<td>7001BMS</td>
<td>Research Techniques in Biotechnology</td>
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<td>30</td>
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<td>1,2,3,4,5</td>
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<td>Principles of Biotechnology</td>
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<td>7025BMS</td>
<td>Critical Review in Biotechnology</td>
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<td>7004CRB</td>
<td>Global Professional Development - Creativity,</td>
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<td>7016BMS</td>
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<tr>
<td>FT</td>
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Table 14.2. Proposed Study Plan (including Sept and Jan intakes and P/T pathway)
Modules 7001BMS and 7002BMS are designed to ensure that students have a firm grasp of the underlying core principles of biotechnology, both theoretical and practical. These modules also aim to help students develop logical thinking and problem solving skills while covering important foundations of biotechnology including molecular biology and analytical chemistry. Reporting of scientific information through diverse formats (traditional written laboratory report, oral presentation and blogs) are used to develop communication skills. Module 7025BMS requires students to draw on their knowledge and skills developed in 7001BMS and 7002BMS, in the form of a critical analysis and review of a scientific publication.

In 7003BMS students focus on the applications of biotechnology in Industrial and Environmental processes including biofuels, bioremediation, biocatalysts, functional foods and biosensors. Students apply their molecular biotechnology knowledge to the area of Medicinal Biotechnology in 7024BMS. The content of 7024BMS focuses on the main types of therapeutic and prophylactic biologicals including antibodies, simple peptides, cytokines, growth factors, enzymes and vaccines. Both 7003BMS and 7024BMS have integrated laboratory sessions where students have the opportunity to undertake group based investigations, and to present their work as a poster at an internal School based symposium (for 7003BMS). Module 7016BMS begins the process of developing a research project proposal which will be carried out in the final semester in 7017BMS. Students also undertake a 10 credit CMI accredited module: Global Professional Development - Creativity, Change & Innovation. Students who successfully complete the module and meet the CMI evidence requirements will gain a L7 Certificate in Strategic Management and Leadership and a L7 Award in Professional Consulting, based on the following units:

1. Strategic Leadership (Unit 7013V1 from the L7 Strategic Management and Leadership qualification)
2. Strategic Leadership Practice (Unit 7014V1 from the L7 Strategic Management and Leadership qualification)
3. Implementing Organisational Change Strategies (Unit 7010V1 from the L7 Professional Consulting qualification)

This will enable students to apply for Chartered Manager status via the qualified route, once the other entry criteria have been met.

Team working, problem solving and creativity alongside independent development are strong themes throughout and are also reinforced with the CMI module.
15 Criteria for Admission and Selection Procedure
The general requirements are in line with University Policy.

Admission requirements for MSc Biotechnology can be found at:

http://www.coventry.ac.uk/course-structure/PG/2018-19/hls/biotechnology-msc/

The requirements for admissions for MSc Biotechnology are:

Students must have one of the following
1. an Honours degree in a Bioscience or Biological Chemistry based undergraduate course – and students will normally have achieved a lower second class (2.2) classification or above
2. or equivalent appropriate qualification

Students whose first language is not English must demonstrate proficiency in the English language equivalent to IELTS 6.5 (with no component less than 5.5). Alternatively students may be admitted with IELTS 6.0 if they attend and pass a compulsory five week pre- sessional English course, operated by Coventry University, before joining their master’s programme.

16 Academic Regulations and Regulations of Assessment

This Course conforms to the standard University Regulations Mode R
17 Indicators of Quality Enhancement

QAA Audit
The QAA's review of higher education undertaken in February 2015 confirmed that Coventry University meets UK expectations in:

- the setting and maintenance of the academic standards of its awards;
- the quality of student learning opportunities;
- the quality of the information about learning opportunities;
- the enhancement of student learning opportunities.

The University has well established mechanisms for the review and evaluation of teaching, learning, assessment, the curriculum and outcome standards.

External examiners’ reports: These have consistently accentuated the high quality, both of provision and quality of graduates in MSc courses within Life Sciences. Such reports confirm the standard of assessments, level of subject-based material and development of key, “transferable”, skills.

Student Feedback: The University received a 85% positive satisfaction score, which is above the national average in the Post Graduate Taught Evaluation (PTES) survey (2016). The School of Life Sciences received an overall satisfaction score of over 90% in the 2016 National Student Survey (NSS) at Undergraduate level. Course and Module student questionnaires have consistently shown good ‘overall satisfaction’ for courses and modules in Biomolecular Sciences.

Facilities: The University provides excellent library and IT provision, and the new Science and Health Building provides outstanding laboratory facilities. These include a 240 workstation Lab+, an analytical suite and research laboratory facilities. The laboratories are newly equipped to allow extensive laboratory experimentation in microbial and animal cell culture, molecular and cell biology and analytical chemistry. The labs are well supported by experienced technical staff.

Staff and staff development: Staff are highly qualified and the majority of full time academic staff have higher degrees (or significant industry experience), plus a significant number are Fellows or Senior Fellows of the Higher Education Academy (HEA). Innovative teaching and assessment strategies are incorporated into modules and courses, reflecting staff interest and expertise. Many staff are involved in research within Biosciences linked to the Faculty Research Centre for Sport, Exercise and Life Sciences (CSELS). Key research areas linked to biotechnology include vaccine development, recombinant enzymes for lignin degradation, novel antimicrobials, pharmaceutical drug modelling and genome sequencing for personalised medicine. Staff are engaged in continuing professional development including membership of professional institutions such as the Institute of Biomedical Science, the Royal Society for Biology, the Royal Society for Chemistry and the HEA. Staff appraisal and regular peer observation, which improves practice and quality of staff teaching within the School, occurs annually.
Enrolled students have access to additional, key sources of information about the course and student support including,

- Faculty Postgraduate Handbook
- Student Course Handbook
- Module Guides
- Module Information Directory
- Moodle

Study Support information is accessible from student services home page