PROGRAMME SPECIFICATION

MSc APPLIED BIOCHEMISTRY AND BIOCATALYSIS

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<tr>
<td>1</td>
<td>Awarding Institution: University of Exeter</td>
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<td>2</td>
<td>School(s)/Teaching Institution: School of Biosciences</td>
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<tr>
<td>3</td>
<td>Programme accredited/validated by: n/a</td>
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<td>4</td>
<td>Final Award(s): MSc</td>
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<td>5</td>
<td>Programme Title: Applied Biochemistry and Biocatalysis</td>
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<td>6</td>
<td>UCAS Code (if relevant):</td>
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<td>7</td>
<td>FHEQ Level of Final Award(s): M</td>
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<td>8</td>
<td>QAA Subject Benchmarking Group: n/a</td>
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<td>9</td>
<td>Date of Production/Revision: June 2009</td>
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10 | Programme Structures and Requirements, Levels, Modules, Credits and Awards

Students study a 180-credit degree programme, which is University-based. The credit rating of a module is proportional to its overall workload and one credit is nominally equivalent to 10 hours of work.

The programme incorporates taught modules, independent learning modules and a research project with the latter accounting for 50% of student effort and associated credits.

Normally, the programme will be studied for 12 months with entry in October each year, but the programme can be offered on a part-time basis over a period of two years if all modules are completed successfully by the end of this period. With modules having defined lecture timetables the student would need to complete the full module programme in each case at one time, but the research project may span both years of the part-time programme.

The programme comprises the following modules (credit values in brackets).

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<thead>
<tr>
<th>CODE</th>
<th>TITLE</th>
<th>CREDITS/ASSESSMENT</th>
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<tbody>
<tr>
<td>BIOM032</td>
<td>Masters Research Project in Applied Biochemistry and Biocatalysis</td>
<td>90 / (D1) (CW)</td>
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<tr>
<td>BIOM030</td>
<td>Dissertation</td>
<td>15 / (S1) (D1)</td>
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<tr>
<td>BIOM509</td>
<td>Professional Skills</td>
<td>15 / (S1/S2) (CW)</td>
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<tr>
<td></td>
<td>and 60 credits from:</td>
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<tr>
<td></td>
<td>BIO3041* Pharmacology &amp; Medicinal Chemistry</td>
<td>15 / (S2) (WR) (CW)</td>
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<td></td>
<td>BIOM029 Advanced Biological Chemistry</td>
<td>15 / (S2) (CW)</td>
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<td></td>
<td>SOCM010 Introduction to Genetics and Society</td>
<td>15 / (S1) (CW)</td>
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<td></td>
<td>BIOM503 Introduction to Molecular Biology</td>
<td>15 / (S1/S2) (CW)</td>
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<td></td>
<td>BIOM504 Sequence Analysis and Structural Bioinformatics</td>
<td>15 / (S1/S2) (CW)</td>
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<tr>
<td></td>
<td>BIOM542 Environmental and Applied Biotechnology</td>
<td>15 / (S1/S2) (CW)</td>
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</table>

*Students who have already completed the BSc degree in Biological and Medicinal Chemistry at the University of Exeter will not be allowed to take BIO3041 Pharmacology & Medicinal Chemistry, as the module will have been completed whilst undertaking their undergraduate degree.
Educational Aims of the Programme

The programme aims to:

1. **Knowledge base for students** - provide students with an advanced background in applied biochemistry, biocatalysis and bioinformatics which will be of particular relevance to the pharmaceutical and biotechnological industries. Students also receive training in medicinal aspects of drug design and can specialise in a more chemical, biological or biochemical area as part of their industrially related research project. Additionally, the project will prepare students to work in or in association with industry and also to continue with postgraduate research in the form of a PhD.

2. **General science training of students** - provide an intellectual training that enables students to develop a rigorous scientific approach in synthesising information and concepts, exercising evaluative judgement and in making arguments. To provide a thorough training in written and verbal communication of scientific information and ideas. To generate in students an appreciation of the importance of the application of applied biochemistry and biocatalysis in academic, industrial, economic, environmental and social contexts.

3. **Specific scientific skills** - equip students with practical skills that will prepare them for a future career as a worker or researcher in this important interdisciplinary area.

4. **Transferable skills** - equip students with a broad range of general skills that will transfer to the future workplace.

5. **Benefit to students of active research** - harness the research expertise of staff in the School of Biosciences to provide a stimulating and current input into teaching and to provide students with training in current research practice.

6. **The learning environment** - provide an attentive, supportive and formative environment for the academic and personal development of our students. To provide high quality education and training through a systematic approach to quality assurance.

Programme Outcomes

This MSc programme in Applied Biochemistry and Biocatalysis will provide students with the necessary knowledge and skills to undertake a career in research, either in industry or in an academic setting. The training provided will give students the breadth and depth of scientific knowledge in the important newly developed area of ‘White Biotechnology’.

On completion of the programme, students will be qualified to apply for a PhD or to gain employment in the pharmaceutical or biotechnology industries, which are among the strongest growth sectors of the UK economy. The programme will be based on a combination of taught modules, independent learning and an extended research project to be carried out either in industry or in association with industry at the University. The programme incorporates a substantial element of hands-on research experience, with enhanced experimental skills being gained alongside experienced research workers.

(a) **Subject knowledge and understanding**

It is intended that, on successful completion of the MSc degree programme, students will:

- Have a sound working knowledge and appreciation of applied biochemistry and biocatalysis principles and practice.
- Understand the principal techniques of biomolecular structural characterisation, including spectroscopy.
- Have an understanding of bioinformatics and its application in biotechnology.
- Have an understanding of medicinal chemistry and drug development.
- Have an appreciation of the social issues involved with current biotechnological and molecular biology applications.
- Have an understanding of how their knowledge can be applied to the area of ‘White Biotechnology’ to improve our overall quality of life.

(b) **Core academic skills**

It is intended that, on successful completion of the degree programme, students will be able to:

- Demonstrate detailed knowledge and understanding of the principles and theories of biochemistry.
- Apply knowledge and understanding of chemistry to the solution of problems in biology and practical areas of the subject.
- Show originality in the application of knowledge, and understand how the boundaries of knowledge are advanced through research.
- Deal with complex issues in the discipline both systematically and creatively.
• Show originality in tackling and solving problems in the context of the programme.
• Present scientific material and arguments clearly, logically and correctly, in writing and orally.
• Apply an understanding of applied biochemistry and biocatalysis at a theoretical and practical level.
• Think about problems critically at the interface areas between Biology, Chemistry, Medicine and Physics.
• Apply knowledge and understanding of applied biochemistry and biocatalysis to the solution of problems of current interest

(c) Personal and key skills

It is intended that, on successful completion of the MSc degree programme, students will be able to:

• Demonstrate self-direction and originality in tackling and solving problems, and act autonomously in planning and implementing tasks at a professional or equivalent level
• Communicate effectively and clearly by verbal, written and visual (poster presentation) means.
• Know how to retrieve information from a variety of sources, including libraries, databases and the internet.
• Use bioinformatics and molecular modelling software.
• Perform standard laboratory procedures and critically review their research project.
• Monitor, by observation and measurement, events or changes, and record such scientific data.
• Manage time effectively.
• Recognise their study skills needed for continuing professional development.
• Work independently or as part of a team in a research setting.
• Prepare a grant proposal for their research to an appropriate research grant funding body.

(d) Confirmation of conformity with the relevant subject benchmark statement, or rationale for non-conformity


The RSC has recently founded a Chemical Biology Forum to enhance its presence in this field, so the programme is suitable for accreditation by the RSC.

13 Teaching, Learning and Assessment Methods

(a) Subject Knowledge and understanding

Lectures by University and external speakers, workshops, tutorials with small groups, practical experience in applied biochemistry and biocatalysis and use of information technology equipment.

Assessment by unseen written examinations, reports of laboratory work, coursework exercises, oral presentations on research project and within specific modules, preparation and display of a poster reporting on a laboratory project, dissertation based on a related research area, literature survey in conjunction with a research project, preparation of grant proposal on research project to relevant research committee, BBSRC or EPSRC.

(b) Core Academic Skills

Individual and group work through lectures, tutorials, practical exercises in bioinformatics and molecular modelling and a research project in industry or industrially related topics within the University laboratories, use of information technology, use of scientific data-bases.

Assessment by unseen written examinations, reports of laboratory work, coursework, exercises, oral presentations, preparation and display of a poster reporting on a laboratory project.

(c) Personal and Key skills

The development of transferable skills forms part of many components of the programme, e.g. in laboratory-based work in industry and at university, tutorials, seminars and the writing of essays and reports from laboratory work, from data base usage, from oral and poster presentations.

The assessment of such skills is incorporated in the assessment of laboratory/industrial research, essays, oral and poster presentation.
At Exeter, the University Library maintains its principal collections in the main library buildings on the Streatham and St Luke’s campuses, together with a number of specialist collections in certain Schools. The total Library collection comprises over a million volumes and 3000 current periodical subscriptions. Information Technology (IT) Services provide a wide range of services throughout the Exeter campuses including open access computer rooms, some of which are available 24 hours, 7 days a week. Additionally, some Schools have their own dedicated facilities. Helpdesks are maintained on the Streatham and St Luke’s campuses, while most study bedrooms in halls and flats are linked to the University’s campus network.

It is University policy that all schools should have in place a system of academic and personal tutors for their students. A University-wide statement on such provision is included in the University’s TQA Manual.

Additionally, the following units at Exeter between them provide a wide range of student support services:

- Student Counselling Service
- Study Skills Service
- Student Advice Centre (Guild of Students)
- Student Health Centre
- Family Centre (Streatham campus)
- International Office
- Foreign Language Centres
- International Student Exchange and Support Office
- Disability Resource Centre
- Chaplaincy
- INTO

The University Careers Advisory service provides expert advice to all students to enable them to plan their futures, through guidance interviews, psychometric testing, employer presentations, skills events, practice job interviews and CV preparation.

The School of Biosciences has a Student/Staff Liaison Committees that allow students to contribute directly to the enhancement of educational and other provision at discipline level. A representative from the Applied Biochemistry and Biocatalysis MSc students will sit on these committees.

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In addition to the services detailed above the student is provided with:

- A personal tutor for each student, during the year of their study in Applied Biochemistry and Biocatalysis.
- A postgraduate tutor who oversees student attendance, progress and progression.
- A student Handbook at the start of the academic year, gives a variety of information including module descriptions, intended learning outcomes, methods of assessment, etc. Further information is available on the School of Biosciences web page www.biosciences.ex.ac.uk/local/
- Regular small group sessions to support the lecture-based material.
- Excellent laboratory facilities for research projects at University within the Exeter Biocatalysis Centre and approved research facilities in industrial laboratories
- Student e-mail.
- Computer-based exercises and web-based learning materials.
- Access to teaching staff (contact by e-mail, telephone, letter, or in person).
- Opportunity to join BioSoc, which is a society run by students for Biosciences students.

Candidates must be able to satisfy the admissions requirements of the University of Exeter and the Applied Biochemistry and Biocatalysis MSc degree programme. University entrance requirements for postgraduate degree programmes are found in the University of Exeter postgraduate Prospectus Normally an appropriate Science degree in a Biological, Chemical or Biochemical discipline.

Overseas students: Applications normally considered on an individual basis. Overseas students must show proficiency in the English language and have an appropriate qualification (e.g. Certificate of Proficiency in English of the Cambridge Local Examinations Syndicate, IELTS, TOEFL and other equivalent examinations).
### Regulation of Assessment and Academic Standards

Each academic programme in the University is subject to an agreed School assessment marking strategy, underpinned by institution-wide assessment procedures. The security of assessment and academic standards is further supported through the external examiners appointed for each programme. Their responsibilities are described in the University’s code for external examiners and include access to draft papers, course work and examination scripts. Attendance at the Board of Examiners and the provision of an annual report are both required. Clear procedures are also in place for the monitoring of these annual reports at both School and University level. See the University’s TQA Manual for details of these processes:

http://www.ex.ac.uk/admin/academic/tls/tqa/

The assessment procedures can be found on the web at:

http://www.ex.ac.uk/admin/academic/tls/tqa/ugexams2.htm

**Role of External Examiner:**

A single External examiner is appointed by the Board of the Faculty of Postgraduate Studies, following recommendations from the School of Biosciences. This single external examiner will have a distinguished academic standing in Applied Biochemistry and Biocatalysis and will be of professorial status. The single external examiner will be involved at all stages to verify academic standards, from approving examination questions to attending the final meeting of the Board of Examiners of MSc in Applied Biochemistry and Biocatalysis and reporting to the Vice Chancellor at the end of the academic year.

### Indicators of Quality and Standards

The University and its constituent Schools draw on a range of data in their regular review of the quality of provision. The annually produced Performance Indicator Dataset details admission, progression, completion and first career destination data, including comparisons over a five-year time-span.

Progression statistics are included in routine internal monitoring and review processes.

### Methods for Evaluating and Improving Quality and Standards

The University has procedures in place for the regular review of its educational provision, including the annual review of both modules and programmes which draw on feedback from such sources as external examiners' reports, student evaluation, student achievement and progression data. In addition, subject areas are reviewed every three years through a subject and programme quality review scheme that includes external input. These procedures are recorded in codes of practice contained in the TQA Manual.

This programme is also subject to review and/or accreditation by professional and statutory bodies, while nearly all subject areas are reviewed from time to time by the national Quality Assurance Agency for HE; see the QAA web site for review reports on subjects at Exeter.

Mechanisms for review and evaluation of teaching, learning, assessment, the curriculum and outcome standards:

- module reviews (student feedback questionnaires and staff responses)
- annual programme reviews
- programme monitoring by programme co-ordinator
- external examiners' reports and responses to recommendations
- peer observation of lectures and seminars, comments being transferred to lecturer concerned
- regular staff appraisals

Committees with responsibility for monitoring and evaluating quality and standards:

- Committees of School of Biosciences
- Student/Staff Liaison Committee
- School Postgraduate Teaching Committee
- Board of Studies for MSc in Applied Biochemistry and Biocatalysis
- Board of Examiners for Applied Biochemistry and Biocatalysis
- University Board of Faculty of Postgraduate Studies

Mechanisms for gaining student feedback on the quality of teaching and their learning experience:

- feedback questionnaires on all lecture and practical modules.
- Student/Staff Liaison Committee
• student representatives on the School Board of Studies, School Safety Committee and Staff Meeting
• personal tutor/tutee discussions
• feedback from informal discussions of programme director with students