BSc (Hons) Biochemistry

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Introduction

All living things are ultimately composed of complex arrays of molecules interacting with one another. Biochemistry attempts to understand the behaviour of these molecules and explain how they give rise to familiar biological properties of both us and our environment.

Biochemistry is central to our understanding of how commonly used pharmaceutical drugs function, enabling the design of more effective treatments. It also provides an understanding of the molecular basis of disease. The biochemical investigation of life enables us to make predictions about how best to maximise human health, and leads to an essential understanding of what happens in common afflictions such as diabetes and obesity.

Biochemistry graduates have always been, and continue to be, in demand in biological and medical research. They also find careers in healthcare, as well as in food and fermentation industries.

Aims and Outcomes

This degree course aims to instil a broad base of knowledge regarding biochemistry at the molecular, cellular and systems levels. Additionally, students will gain an in depth understanding of selected aspects of Biochemistry which will reflect the research expertise and strengths within the School, and will be instructed in the many applications of this subject. A thorough understanding of the scientific method and the development of a critical approach to problem solving and research literature will also be gained. In carrying out a research-based project and the presentation of the project findings as a thesis, students will gain expertise in time management, data handling, and in the transferable skills associated with mastering statistics, graphics and word processing software packages.

General Enquiries

The Degree Programme Co-ordinator is Dr Berndt Muller (e-mail:b.mueller@abdn.ac.uk) and any query concerning the degree programme should be addressed to him. Enquiries concerning a specific module should be made to the course co-ordinator for that module (See University Catalogue of Courses or SMS World Wide Web Pages for names). The Head of School of Medical Sciences is always available for advice regarding any of the degree schemes run by his School as well as matters such as careers advice. In the first instance appointments to see any of the above staff should be made with the School Office, Room 2:62:3 sited on level 2, Phase 2, Institute of Medical Sciences (01224-437471 internal 7471).
General Requirements

In order to complete the degree scheme the student’s programme of studies must comply with the Supplementary Regulations for the Degree of Bachelor of Science in Pure Science (BSc) supplied to the student in the extract from the University Calendar “Degrees in Science”. This will involve taking a number of modules outwith the School of Medical Sciences during years 1 and 2.

Industrial Placements

There is scope within the degree schemes for students with very good academic records to undertake a 1 year, paid, industrial placement as part of their degree. The placement is undertaken in year 4 of the degree scheme and students return to the University to complete their honours year in year 5. Students interested in industrial placements are encouraged to contact Dr Allison Carrington in the first instance to discuss their plans. Students must also register for, and complete, the pre-placement course, BT3006, in the first half of their third year. On successful completion of a placement and their honours year students will graduate with an MSci. Further details of this initiative can be obtained from Dr Allison Carrington (a.carrington@abdn.ac.uk).

Looking Forward to the Honours Year

Many of you will be intending to continue for a 4th year and to complete an Honours degree in the School of Medical Sciences. There are a few points you should bear in mind if this is your intention.

1. Standard of entry

We try to welcome as many students as possible into the Honours year, but it must be recognised that it will only benefit the more able students. If 3rd year is a real struggle, then it may be too much for you to take on. As a general rule, we think grades at lower second class level or better in each 3rd year module is a reasonable sign that you have reached the appropriate standard. Exceptions can be made if there is good reason, and a mixture of excellent results and one or two slightly poorer ones may sometimes be acceptable. Do let us know if there is an explanation for any poor performance, so that we can do our best to take it into account.

2. Know what’s involved

The teaching in the Honours year in general involves fewer lectures and more input from you than in previous years. You will take the modules specified for your particular degree scheme, these amounting to 120 credits of study. You are required to include three compulsory courses and an Honours Project, which can be laboratory or library based, in your study programme. You will write a thesis and give a short presentation on your project. For all students taking an Honours project, the final degree assessment will comprise contributions from set essays and a research thesis, with the remainder coming from the papers associated with the taught modules taken in the Honours year, a paper on data analysis and interpretation, and a general essay paper.

3. Prerequisites

Check that the courses you plan for 3rd year provide the foundation for the Honours degree you hope to take. Please refer to the appropriate Degree Programme Guide (available from the www SMS home page or from the School Office, IMS Building). If in doubt, consult your Degree Programme Co-ordinator (Dr Berndt Muller). Please do this in plenty of time.

4. Summer research projects

It is possible to apply for funding for summer projects (8-10) weeks between 3rd and 4th year. This is a helpful base for your Honours project, which must be in a different area of research and usually with a different supervisor. Dr Allison Carrington will email members of the class at the end of November asking for CVs if they wish to be considered for a summer vacation
studentship, and if they have any preferences for staff in whose laboratory they would wish to undertake the work.

**Assessment**

Throughout your course, assessment takes the form of continuous assessment (based upon performance in prescribed tasks such as practical reports and essays) and written degree examinations (multiple choice or essay questions) taken in the examination diets allotted to each half session. The final year assessment is made up of 5 examination papers, continuous assessment essays and the submission of a thesis based on your project. Some students may be required to attend an oral examination (viva) with the external examiner. Details concerning assessments and course work within each module are provided in the Course Handbooks. These Course Handbooks are available either from the School Office or on the SMS World Wide Web Pages. Details concerning the relationship between credits and weightings may be found on [http://www.abdn.ac.uk/sms](http://www.abdn.ac.uk/sms)

**Academic Appeals**

1. From time to time a student may seek to appeal against a decision involving academic judgement taken, in terms of the Regulations for the degree or other qualification for which he or she is studying, among others, by a Head of School refusing an award of a Merit Certificate, or admission to a higher level course; by Examiners refusing to award a pass or awarding an unacceptable class of Honours (or making no award); by the Examiners appointed to examine a thesis for a higher degree; or by the relevant Undergraduate Programme Committee or Academic Postgraduate Officer in relation to terms of study. Specific rights of appeal are very limited indeed but the Senate has a general duty to regulate and superintend the teaching of the University, and the Court has the authority to review any decision of the Senate which may be appealed against by a member of the University.

2. Academic appeals must be lodged with the Academic Registrar within 14 days from the date of the issue of the decision being appealed against, unless the relevant Appeals Committee constituted under 7 or 8 below is satisfied that the decision had not become known to an appellant until too late to submit an appeal within that period.

3. Notwithstanding the above time limit, details of illness (which must be certified by a medical practitioner) and/or other personal circumstances which students believe may have affected their performance in an element of prescribed degree assessment will be accepted as grounds for appeal only if the Head of the relevant School has received written notification of them no later than one week after the date on which a student submitted or appeared for the assessment concerned. Where good reasons have prevented a student from notifying the Head of School within this period, the student should write to the Head of School as soon as is practicable and give details both of the illness (which must be certified by a medical practitioner) and/or other personal circumstances and of the events which prevented him or her from notifying the Head of School within the prescribed period. Details reported after notification of a result will be accepted as grounds of appeal only in exceptional circumstances.

**Problems with Course Work**

If students have difficulties with any part of the course that they cannot cope with alone they should notify someone immediately. If the problem relates to the subject matter you may be best advised to contact the member of staff who is teaching that part of the course. Students with registered disabilities should contact either the IMS based School Office (Mrs Jenna Reynolds, Email: j.reynolds@abdn.ac.uk, Tel: 01224 437471) to ensure that the appropriate facilities have been made available. Otherwise, you are strongly encouraged to contact any of the following as you see appropriate:
Course student representatives.
Course co-ordinator
Convenor of the relevant student-staff liaison committee
Personal Tutor
School Disabilities Co-ordinator, Dr Derryck Shewan (d.shewan@abdn.ac.uk)

Staff are based at Foresterhill (IMS & Polwarth Building) and we strongly encourage the use of e-mail or telephone the School office (Mrs Jenna Reynolds, email: j.reynolds@abdn.ac.uk, tel: 01224 437471). You may be wasting your time to travel to Foresterhill only to find staff unavailable.

Course Details

All courses run in the School have practical and general skills (enterprise) components as integral parts of the teaching package. For detailed descriptions of the courses that make up the BSc (Hons) Biochemistry Degree consult the University Course Catalogue (http://www.abdn.ac.uk/registry/courses), or in the case of modules taught within the School of Medical Sciences consult the SMS World Wide Web Pages.

This document supplements the regulations in the University Calendar and the descriptions of modules given in the University "Catalogue of Courses". It is correct at the time of going to press but is open to change.

1st Year Biochemistry Course Requirements

There are no courses in Biochemistry in the 1st Year (Level 1). Intending Honours students in Biochemistry require a basic level of general physical and chemical principles and hence are required to take (or gain exemptions from) in the first half session CM1020 Chemistry for Life Sciences 1 or CM1021 Chemistry for Physical Sciences 1 and in the second half session CM1512 Chemistry for Life Sciences 2 or CM1513 Chemistry for Physical Sciences 2. Pre-requisites for second year biochemistry/molecular biology courses, in addition to chemistry, include in the first half session SM1001 Introduction to Medical Sciences and in the second half session SM1501 The Cell. The SM modules will provide a general background in animal biology, thus preparing the student for the more detailed studies of mammalian biochemistry and molecular biology that will be made in the second year of study.

Prescribed Level One Courses

First Half Session

Introduction to Medical Sciences (SM1001, 15 credit points) and
Chemistry for Life Sciences 1: (CM1020, 15 credit points)

Plus TWO other courses of your choice worth 15 credit points each

Courses of your choice may include Physics for Biological and Environmental Scientists (PX1013, 15 credits) for students with C or more at Higher (or equivalent) in Maths/Physics, to underpin future studies in Biochemistry. Alternatively, for students with little or no Maths/Physics background, Tools for Science (TS1001, 15 credits) may be useful.

Second Half Session

The Cell (SM1501, 15 credit points)
Chemistry for Life Sciences 2 (CM1512, 15 credit points)

Plus TWO other courses of your choice worth 15 credit points each
**Timetable for Year 1**

<table>
<thead>
<tr>
<th>First Half Session</th>
<th>Second Half Session</th>
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<tbody>
<tr>
<td>SM1001</td>
<td>SM1501</td>
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<tr>
<td>CM1020</td>
<td>CM1512</td>
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<tr>
<td>2 other modules</td>
<td>2 other modules</td>
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**2nd Year Biochemistry Course Requirements**

Four modules covering Biochemistry, Molecular Biology, Genetics and Microbiology are required in the 2nd Year (Level 2). These are: Molecular Biology of the Gene (BI20M3), Genes & Evolution (BI2017), Microbes, Infection & Immunity (BI25M5) and Energy for Life (BI25M7). In addition, students must take 2 compulsory key skills courses which are Foundation Skills for Life Sciences (SM2001) and Research Skills for Medical Sciences (SM2501). Other courses to go with these modules may include Energetics of Change in Chemical & Biological Processes (CM2010) and Organic & Biological Chemistry (CM2514).

**Prescribed Level Two Courses**

**First Half Session**
- Molecular Biology of the Gene (BI20M3, 15 credit points)
- Foundation Skills for Life Sciences (SM2001, 15 credit points)
- Genes & Evolution (BI2017, 15 credit points)
- One other 15 credit course of your choice, which may include:
  - Energetics of Change in Chemical & Biological Processes (CM2010)

**Second Half Session**
- Energy for Life (BI25M7, 15 credit points)
- Research Skills for Medical Sciences (SM2501, 15 credit points)
- Microbes, Infection & Immunity (BI25M5, 15 credit points)
- One other 15 credit course of your choice, which may include:
  - Organic & Biological Chemistry (CM2514)

**Timetable for Year 2**

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<thead>
<tr>
<th>First Half Session</th>
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<tbody>
<tr>
<td>BI2017</td>
<td>BI25M7</td>
</tr>
<tr>
<td>SM2001</td>
<td>SM2501</td>
</tr>
<tr>
<td>BI20M3</td>
<td>BI25M5</td>
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<tr>
<td>1 other module</td>
<td>1 other module</td>
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**3rd Year Biochemistry Course Requirements**

One hundred and twenty credits in Biochemistry are required in the 3rd Year (Level 3). Modules taken in the first half session of the third year in molecular biology build on the modules taken at Level 2 by enhancing the students’ understanding of the major applications of biochemistry and
molecular biology. Modules taken in the second half session will provide detailed insights into specific areas of mainstream cellular biology.

To meet the requirements for Enhanced Study, in addition to the 90 credits prescribed for your Degree Programme, you are required to take another 30 credit level 3 course of your choice. The School of Medical Sciences runs the following three 30 credit Disciplinary Breadth courses at level 3 which may be of interest to students studying Medical Sciences Degree Programmes.

- SM3001 Frontiers of Molecular Medical Sciences
- SM3002 Frontiers of Biomedical Sciences
- SM3003 Frontiers of Applied Medical Sciences

**Prescribed Level Three Courses**

**First Half Session**
- The Molecular Biology of the Cell (MB3006, 30 credit points)
- Plus **ONE** other module of your choice worth 30 credit points

**Second Half Session**
- The Molecular Control of Cell Function (BC3503, 30 credit points)
- Plus **ONE** of the two courses below:
  - Genetics (GN3502, 30 credit points) OR
  - Molecular Microbiology (MC3504, 30 credit points)

**Timetable for Year 3**

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<tr>
<th>First Half Session</th>
<th>Second Half Session</th>
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<tr>
<td>MB3006</td>
<td>BC3503</td>
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<tr>
<td>1 other module</td>
<td>Either GN3502 or MC3504</td>
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**4th Year Biochemistry Course Requirements**

One hundred and twenty credits in Biochemistry are required in the 4th Year (Level 4). Modules taken in the first half session will provide detailed insights into specific areas of mainstream biochemistry. The second half session is fully occupied with a research project chosen from a list based on the research interests of the staff of the School of Medical Sciences. There are NO examinations at the end of the first half session. Instead the students proceed straight to their research projects and sit a diet of final honours examinations at the end of the second half session. The first half session revision period is combined with that of the second half session to give four clear weeks for revision prior to the final examinations.

**Prescribed Level Four Courses**

**First Half Session**
- Honours Biochemistry – Option 1 (BC4014, 15 credit points)
- Honours Biochemistry – Option 2 (BC4314, 15 credit points)
- Honours Advanced Molecular Biology (MB4050, 30 credit points)
Second Half Session
Biochemistry Honours Research Project (BC4502, 60 credit points)

Timetable for Year 4

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<thead>
<tr>
<th>First Half Session</th>
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<td>BC4514</td>
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<tr>
<td>BC4314</td>
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<tr>
<td>MB4050</td>
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<tr>
<td>MB4901 – Honours Data Analysis Exam Paper</td>
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<tr>
<td>MB4902 – Honours General Essay Exam Paper</td>
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