Overview

Biotechnology can be defined as the use of various biological processes to make products and perform services. In biotechnology, living cells and biochemical macromolecules such as proteins, DNA and RNA are applied in a rapidly expanding range of activities of direct benefit to society. Biotechnology is used for the production of pharmaceuticals, food and industrial chemicals, in the development of improved crops and livestock for farming, for environmental clean-up, and in forensics. Modern biotechnology makes practical use of the most recent scientific advances in areas such as molecular genetics and molecular cell biology.

The development of recombinant DNA technology has resulted in the ability to create, modify and improve industrial organisms and to produce large quantities of any useful protein. Based on this technology, biopharmaceuticals including hormones, vaccines, anti-hypertensive agents, anti-inflammatory agents and new therapies for the treatment of cancer are being developed with the potential to revolutionise medicine. The sequencing of the human genome and the rapid emergence of high-throughput genomic and proteomic techniques is resulting in a surge of new drug targets. Translation of this advanced knowledge into useful therapies and improved medical practices requires the application of biotechnology.

Microorganisms and viruses are being modified for use in controlling plant and animal diseases and pests. Diagnostic kits are being developed for use in forensic science and in product identification and quality control. Genetic improvements in agriculture, plants and animals are becoming a reality, as is the control of inborn genetic disorders in humans. The ability to treat diseased and injured organs with replacement cells and tissues generated outside of the body is advancing rapidly.

The future for expansion in all the above areas is immense. Our ability to cope with many medical, environmental, agricultural and manufacturing problems in the 21st
century will depend heavily on advances in biotechnology.
<table>
<thead>
<tr>
<th><strong>Faculty</strong></th>
<th>Faculty of Science</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Campus</strong></td>
<td>Kensington</td>
</tr>
<tr>
<td><strong>Study Level</strong></td>
<td>Undergraduate</td>
</tr>
<tr>
<td><strong>Typical duration</strong></td>
<td>4 Years</td>
</tr>
<tr>
<td><strong>Delivery Mode</strong></td>
<td>Face-to-face</td>
</tr>
<tr>
<td><strong>Intake Period</strong></td>
<td>Term 1, Term 3</td>
</tr>
<tr>
<td><strong>Academic Calendar</strong></td>
<td>3+ Calendar</td>
</tr>
<tr>
<td><strong>Minimum Units of Credit</strong></td>
<td>192</td>
</tr>
<tr>
<td><strong>Award type</strong></td>
<td>Bachelors Honours</td>
</tr>
<tr>
<td><strong>Award(s)</strong></td>
<td>Bachelor of Biotechnology (Honours) -</td>
</tr>
<tr>
<td></td>
<td><strong>BBiotech(Hons)</strong></td>
</tr>
<tr>
<td><strong>UAC Code</strong></td>
<td>429400</td>
</tr>
<tr>
<td><strong>CRICOS Code</strong></td>
<td>088871C</td>
</tr>
</tbody>
</table>
Learning Outcomes

1. Investigate and explain ethical and social issues of technology and innovation on society, individual health and the environment.

Global Citizens  Professionals  Leaders

2. Understand the fundamental science and emerging scientific research that underpins the biotechnology sector.

Scholars

3. Develop numerical, laboratory, bioprocessing and interpretative skills required for the specialised areas of biotechnology.

Professionals  Scholars

4. Demonstrate the ability to apply the principles of teamwork, collaboration and communication through the development of laboratory/research reports and business cases in the cross-disciplinary context of biotechnology.

Leaders  Scholars  Global Citizens

5. Critically review and analyse scientific literature, derive hypotheses, design and perform experimental approaches, and analyse and communicate the findings, within the context of an Honours research project.

Professionals  Scholars

Graduate Capabilities:

For more information on Graduate Capabilities, please click on this link.
Program Structure

Students must complete 192 UOC as a standalone program.

Students in the Biotechnology (Honours) program are expected to complete **192 UOC** of courses.

**168 UOC of Science courses:**
- 84 UOC of core courses in Stages 1 to 3 as specified below
- 36 UOC of approved electives in Stages 2 and 3
- 48 UOC Honours year

**12 UOC Free Electives.** These courses can be taken from any Faculty of the University at any stage of your program.

**12 UOC General Education courses.** Please see the rules regarding General Education below. These courses can be taken at any stage in your program.

Please click the Sample Programs link below to view a typical enrolment pattern for this program.

Level 1 Core Courses

Students must take 36 UOC of the following courses.

**BABS1201 | 6 UOC**
Molecules, Cells and Genes

**BABS1202 | 6 UOC**
Applied Biomolecular Sciences

One of the following:

**CHEM1011 | 6 UOC**
Chemistry 1A: Atoms, Molecules and Energy

**CHEM1031 | 6 UOC**
Higher Chemistry 1A: Atoms, Molecules and Energy

One of the following:

**CHEM1021 | 6 UOC**
Chemistry 1B: Elements, Compounds and Life
CHEM1041  |  6 UOC
Higher Chemistry 1B: Elements, Compounds and Life

One of the following:
MATH1031  |  6 UOC
Mathematics for Life Sciences

MATH1131  |  6 UOC
Mathematics 1A

MATH1141  |  6 UOC
Higher Mathematics 1A

One of the following:
MATH1041  |  6 UOC
Statistics for Life and Social Sciences

MATH1231  |  6 UOC
Mathematics 1B

MATH1241  |  6 UOC
Higher Mathematics 1B

**Level 2 Core Courses**

Students must take 24 UOC of the following courses.

BABS2011  |  6 UOC
Current Trends in Biotechnology

BIOC2101  |  6 UOC
Principles of Biochemistry (Advanced)

BIOC2201  |  6 UOC
Principles of Molecular Biology (Advanced)

MICR2011  |  6 UOC
Microbiology 1
**Level 3 Core Courses**

Students must take 24 UOC of the following courses.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>UOC</th>
</tr>
</thead>
<tbody>
<tr>
<td>BABS3031</td>
<td>6</td>
</tr>
<tr>
<td>Biotechnology and Bioengineering</td>
<td></td>
</tr>
<tr>
<td>BABS3061</td>
<td>6</td>
</tr>
<tr>
<td>Medical Biotechnology</td>
<td></td>
</tr>
<tr>
<td>BABS3071</td>
<td>6</td>
</tr>
<tr>
<td>Commercial Biotechnology</td>
<td></td>
</tr>
<tr>
<td>BABS3200</td>
<td>6</td>
</tr>
<tr>
<td>Synthetic Biology</td>
<td></td>
</tr>
</tbody>
</table>

**Level 4 Core Course**

Students must take BABS4516 (16 UOC) three times per year for a total of 48 UOC.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>UOC</th>
</tr>
</thead>
<tbody>
<tr>
<td>BABS4516</td>
<td>16</td>
</tr>
<tr>
<td>Biotechnology and Biomolecular Sciences Honours</td>
<td></td>
</tr>
</tbody>
</table>

**Level 2 and Level 3 Electives**

Students must take at least 36 UOC of the following courses.

- any level 2 Biotechnology & Biomolecular Sciences course
- any level 3 Biotechnology & Biomolecular Sciences course
- any level 2 Bioinformatics course
- any level 3 Bioinformatics course
- any level 3 Biochemistry course
General Education

Students must take 12 UOC of the following courses.

Any course defined as a Science course cannot be taken as General Education (GE). All other courses can be used to fulfil the GE requirement of this program, including GEN# coded courses. Any exceptions to these rules must be approved by the Associate Dean (Academic Programs) or nominee.

any General Education course

Course Information Rule

GEN# courses cannot count towards the free elective component, or towards science core courses or science electives in the program. Any exceptions to these rules must be approved by the Associate Dean (Academic Programs) or nominee.

Excluded General Education Courses

Students may not undertake any of the following excluded courses.
any Computer Science course

any Food Technology course

any course offered by School of Medical Sciences

any course offered by Faculty of Science

any General Education - Faculty of Science course

**Free Electives**

Students must take 12 UOC of the following courses.

*any course*

**Suggested Free Electives**

Suggested Free Electives:

- ACCT1501 Accounting and Financial Management 1A
- MGMT2010 Innovation & Entrepreneurship

**Maximum Level 1 UOC**

A maximum of 48 units of credit of level 1 courses can be taken throughout this entire program, excluding any GEN

*any level 1 course*

**Level 4 Maturity**

Students must have completed 144 UOC before taking any of the following courses.

*any level 4 course*

**Suggested Level 2 Science Electives**

BABS2202 Molecular Cell Biology 1
BABS2204 Genetics or BABS2264 Genetics (Advanced)
BINF2010 Introduction to Bioinformatics  
CHEM2021 Organic Chemistry: Mechanisms & Biomolecules  
CHEM2041 Analytical Chemistry: Essential Methods  
PHAR2011 Introductory Pharmacology and Toxicology  
SCIF2199 Science Work Placement  

**Suggested Level 3 Science Electives**  
MICR3061 Viruses and Disease  
BABS3081 Bacteria & Disease  
MICR3071 Environmental Microbiology  
BABS3021 Microbial Genetics or MICR3621 Microbial Genetics (Advanced)  
BIOC3261 Human Biochemistry  
BABS3041 Immunology 1  
BIOC3111 Molecular Biology of Proteins  
BIOC3271 Molecular Cell Biology 2 or BIOC3671 Molecular Cell Biology 2 (Advanced)  
BABS3291 Genes, Genomes & Evolution  
BABS3151 Human Molecular Genetics & Disease  
BABS3121 Molecular Biology of Nucleic Acids or BABS3621 Molecular Biology of Nucleic Acids (Advanced)  
BINF3010 Bioinformatics Methods & Applications  
BABS3281 Molecular Frontiers  
PHAR3101 Drug Discovery, Design and Development  
PHAR3102 Molecular Pharmacology  

**Sample Programs**  
To access sample program(s), please visit:  
Sample Science Programs  

**Enrolment Disclaimer**  
Unless advised otherwise by your program authority, you should follow the rules for the handbook for the year you commenced your program. You are also responsible for ensuring you enrol in courses according to your program requirements. myUNSW enrolment checks that you have met enrolment requirements such as pre-requisites for individual courses but not that a course will count towards your program requirements.
Related Programs

Bachelor of Advanced Science (Honours) - BAdvSci(Hons)

3962 Advanced Science (Honours)

Faculty: Faculty of Science
Campus: Kensington
Units of Credit: 192
Typical Duration: 4 Years

Read More

Bachelor of Science - BSc

3970 Science

Faculty: Faculty of Science
Campus: Kensington
Units of Credit: 144
Typical Duration: 3 Years

Read More
Program Requirements

Recognition of Prior Learning

UNSW Students may be granted Recognition for Prior Learning (RPL) which may or may not reduce the amount of learning required to achieve a degree at UNSW. Generally, RPL is only granted based on the completion of tertiary-level studies, but in exceptional circumstances may also include non-formal or informal learning such as professional experience. RPL will not be granted based on partly completed tertiary courses. All applications for RPL at UNSW are subject to UNSW Recognition of Prior Learning (Coursework Programs) Policy and Procedures. Students seeking credit for courses completed at another university are required to submit documentary evidence (course outlines, academic transcripts) to support their application, and to nominate the course(s) for which they seek credit. In addition, the following conditions apply for all UNSW Science programs (including the Science component of dual award programs): Specified course credit, i.e. credit granted for an exact or near exact equivalence to a course at UNSW, will not be granted when more than 7 years has elapsed from the successful completion of the course (or other learning) and the student’s commencement in the Science program. Where this time period is shorter it will be stipulated in the individual rules for the relevant program. Unspecified course credit (e.g. General Education or free electives) will not be granted when more than 10 years has elapsed from the successful completion of the course (or other learning) and the student’s commencement in the Science program. Students may only receive credit of up to a maximum of 50% of the coursework component of their Science program, excluding Honours. For most undergraduate programs this will be 72 UOC. For dual award programs that include a Science component, it will be a maximum of 50% of the Science component of the dual degree, excluding Honours. Credit for the other program will be assessed by the Faculty that administers that program. Applications for RPL will only be assessed for students who have accepted a place to study in a UNSW Science program. Students must formally apply for RPL unless they become a UNSW student as part of a formal Articulation Agreement. Applications for RPL should be made as early as possible in the student’s program. Students who are readmitted into a Science program after a period of unapproved absence or deferment, or after exclusion, will not necessarily retain credit for all units completed at UNSW prior to the absence if the date of completion of the units of study is greater than the 7 and 10-year rules outlined in points 1 and 2 above. In these cases, the credit retained will be decided by the Associate Dean (Academic Programs) in consultation (when necessary) with the Program and/or Course Authority.
**Progression Requirements**

Progression to Stages 2, 3 & 4 is subject to academic performance. Students will be required to maintain a Weighted Average Mark (WAM) of at least 65 for progression to Stage 3, and to Stage 4. Students who do not meet the requirement to enter Stage 4 (Honours) will be transferred to program 3970 (Bachelor of Science) and will, on successful completion of the first three stages of program 3053, graduate with the degree Bachelor of Science (program 3970) with a major in Biotechnology.

Students who transfer to program 3970 before successful completion of stage 1 to 3 of program 3053 will be required to complete an approved major in program 3970 as specified in the Handbook.

For more information on university policy on progression requirements please visit Academic Progression.
Professional Outcomes

Career Opportunities

Start-up biotech and pharmaceutical companies; agricultural, food, chemical and veterinary industries; waste treatment and environmental protection; education; research and government departments; intellectual property; technology assessment for the finance industry.
Recognition of Achievement

University Medal

The University Medal is awarded to recognise outstanding academic performance by a bachelor degree student in line with the University Medal Policy and University Medal Procedure.

Honours Classes

Honours

Student receive a final grade at the end of their research project which represents their honours grading. Honours Grades are awarded as follows:-

- Honours Class 1: mark or weighted average of 85 or greater;
- Honours Class 2 Division 1: mark or weighted average from 75 to 84;
- Honours Class 2 Division 2: mark or weighted average from 65 to 74;
- Honours Class 3: mark or weighted average below 65;

Components that contribute to the research project grade are:-

- Thesis - 70%;
- Presentation - 10%;
- Final thesis interview - 10%;
- Student aptitude / performance - 10%

University Medal

Nominees for the University Medal will be determined by Schools within the Faculty of Science in accordance with UNSW University Medal policies and procedures.
Additional Information

Definition of 'Science' courses

Table 1

Science Handbook Rules and Editions

Students must follow the program rules and requirements in the UNSW Handbook published in the year they commence their studies with the Faculty of Science.

Students who transfer from another UNSW Faculty into Science (for example, from a Bachelor of Arts into a Bachelor of Science) must follow the program rules and requirements in the UNSW Handbook published in the year of their transfer.

Students, who are readmitted to UNSW after a period of unapproved absence or deferment, or after exclusion, must satisfy the program rules in the Handbook published in the year of their readmission. In addition, these students may be subject to restrictions on which courses taken at UNSW may be counted on their return. In some cases, students returning from an unapproved absence may be required to repeat courses. See the Recognition of Prior Learning (RPL) and Advanced Standing section below for more details. Students who take approved leave or deferment will follow the Handbook for the year of their original commencement unless otherwise approved by the Associate Dean (Academic Programs).

Faculty of Science Rules

The Faculty of Science has some rules that relate to all students enrolled in programs offered by the Faculty in relation to recognition for prior learning, general education, course exclusions, study load, and cross-institutional study. All students should read the information contained on the Faculty General Rules and Requirements page.
Program Fees

At UNSW fees are generally charged at course level and therefore dependent upon individual enrolment and other factors such as student's residency status. For generic information on fees and additional expenses of UNSW programs, click on one of the following:

- Domestic Students
- Commonwealth Supported Students
- International Students
Pre-2019 Handbook Editions

Access past handbook editions (2018 and prior)

Pre-2019 Handbook Editions
© UNSW Sydney (CRICOS Provider No.: 00098G), 2019. The information contained in this Handbook is indicative only. While every effort is made to keep this information up-to-date, the University reserves the right to discontinue or vary arrangements, programs and courses at any time without notice and at its discretion. While the University will try to avoid or minimise any inconvenience, changes may also be made to programs, courses and staff after enrolment. The University may also set limits on the number of students in a course.

Authorised by Deputy Vice-Chancellor (Academic)
CRICOS Provider Code 00098G
ABN: 57 195 873 179