Biotechnology

Undergraduate Handbook 2018

THE UNIVERSITY OF AUCKLAND
Te Whare Wānanga o Tāmaki Makaurau
NEW ZEALAND

SCIENCE

SCHOOL OF BIOLOGICAL SCIENCES

Welcome to Biotechnology

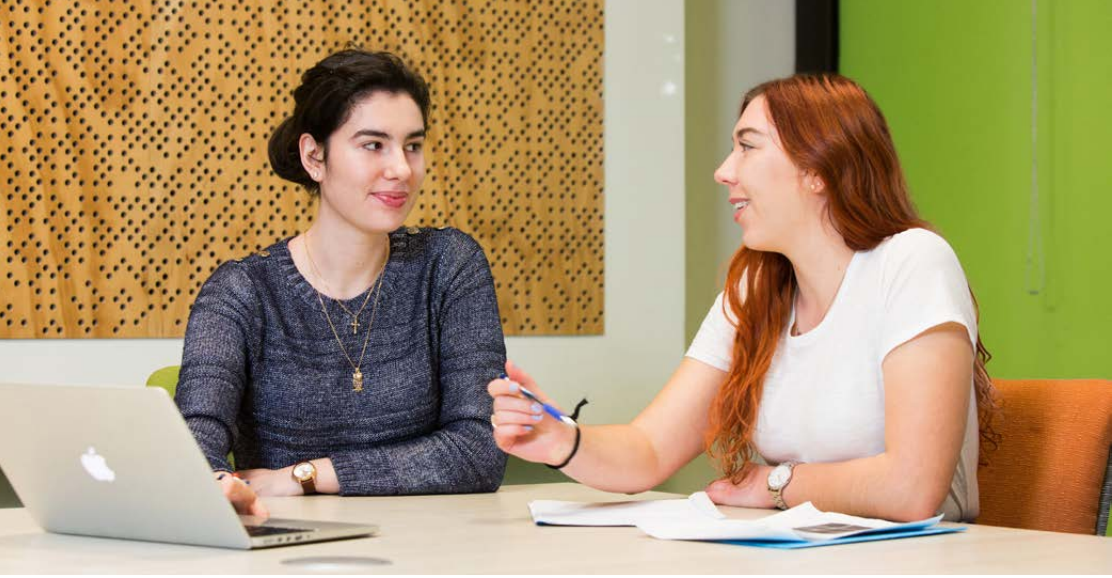
Biotechnology, in its broadest sense, is the commercial exploitation of living organisms or their components, such as proteins.

Traditionally, these technologies have encompassed industrial microbiology, and dealt with ancient processes such as brewing or the microbial production of cheese and yoghurt, for instance. In the last few years, however, an avalanche of genetic and protein information has been discovered, with equally impressive advances in transgenic and animal cloning technologies.

In this light, biotechnology has broadened its scope and is making significant impacts on our health, welfare and nutrition, and how we interact with our environment. It is exciting to see such a tangible translation of the work from our laboratories into life-enhancing commercial developments, and the global placement of our graduates in these productive enterprises.

We welcome students with an interest in technology and commercialisation to this major.

KERRY LOOMES
Director of Biotechnology



Bachelor of Science in Biotechnology

A BSc major in Biotechnology provides you with a strong foundation in biological sciences, biotechnology and entrepreneurship. The programme enables you to be taught by specialists from the Faculty of Science, the Business School and the Faculty of Medical and Health Sciences.

After an introduction to core biological and chemical concepts, instruction is provided in the areas of fermentation technology, aspects of medical technology, down-stream processing and protein purification and their applications. In addition, the specialisation includes courses in innovation and entrepreneurship, managing technology and a wider appreciation of the social, legal, and ethical place of biotechnology in society.

Preparation for school leavers

Students will be selected on the basis of their rank score. There are no required subjects, but we recommended Biology, Chemistry, Physics and Statistics as subjects that will prepare you for this programme. English, or another subject that develops literacy and communication skills, would also be beneficial.

For more information:
www.science.auckland.ac.nz/subject-guide

Why study Biotechnology?

Biotechnology, in its broadest sense, is the commercial exploitation of living organisms or their components, such as proteins. The last few years has seen impressive advances in information about protein, genetics and transgenic and animal cloning technologies. Biotechnology has broadened its scope to make a significant impact on our health, nutrition and how we interact with the environment.

For more information:
www.science.auckland.ac.nz/biotech

For course planning and enrolment, go to www.science.auckland.ac.nz/student-centre

BSc degree planner – Biotechnology

BSc

Year 1	BIOSCI 101	BIOSCI 106	BIOSCI 107	CHEM 110 or 120				GEN ED
					With appropriate prerequisites can also be filled by Stage II or III.			
Year 2	BIOSCI 201	BIOSCI 202	BIOSCI 203	BIOSCI 204	SCIGEN 201	STATS 101 or 108 or BIOSCI 209		GEN ED
							Any Stage	
Year 3	BIOSCI 350	BIOSCI 351	BIOSCI 349 or 356	BIOSCI 353 or 354	BIOSCI 340, 347, 348, MEDSCI 314	BIOSCI 340, 347, 348, MEDSCI 314	INNOVENT 203	INNOVENT 204

1. Courses in a minimum of three subjects listed in the BSc Schedule
2. At least 180 points (12 courses) must be above Stage I
3. Up to 30 points (two courses) may be taken from outside the faculty
4. 30 points (two courses) must be taken from the appropriate General Education Schedules for BSc students

It is the student's responsibility to check that the final programme complies with University Regulations. The Faculty of Science is the final authority on all BSc regulations.

To view regulations for majors, and course descriptions, see www.calendar.auckland.ac.nz

BSc degree requires: 360 points (24 x 15 point courses). Each box represents one 15 point course.

We recommend that students enrol in eight courses each year.

Degree planners for double majors can be found at www.science.auckland.ac.nz/course-planning

Undergraduate Biotechnology courses		
Course code	**Title**	**Semester**
Stage I		
BIOSCI 101	Essential Biology: From Genomes to Organisms	S1
BIOSCI 106	Foundations of Biochemistry	S2
BIOSCI 107	Biology for Biomedical Science: Cellular Processes and Development	S1
CHEM 110	Chemistry of the Living World	S1, S2
CHEM 120	Chemistry of the Material World	S2
STATS 101	Introduction to Statistics	S1, S2, SS
STATS 108	Statistics for Commerce	S1, S2, SS
Stage II		
BIOSCI 201	Cellular and Molecular Biology	S1
BIOSCI 202	Genetics	S2
BIOSCI 203	Biochemistry	S2
BIOSCI 204	Principles of Microbiology	S1
BIOSCI 209	Biometry	S1
INNOVENT 203	The Entrepreneurial Mindset	S1, S2
INNOVENT 204	Understanding Entrepreneurial Opportunities	S1, S2
SCIGEN 201	Innovating for a Knowledge Society	S1
Stage III		
BIOSCI 340	Plant Cell Biology and Biotechnology	S2
BIOSCI 347	Environmental Microbiology and Biotechnology	S2
BIOSCI 348	Food and Industrial Microbiology	S2
BIOSCI 349	Biomedical Microbiology	S1
BIOSCI 350	Protein Structure and Function	S1
BIOSCI 351	Molecular Genetics	S1
BIOSCI 353	Molecular and Cellular Regulation	S2
BIOSCI 354	Gene Expression and Gene Transfer	S2
BIOSCI 356	Developmental Biology and Cancer	S1
MEDSCI 314	Immunology	S2

For course descriptions and prerequisite information, go to www.science.auckland.ac.nz/biotech

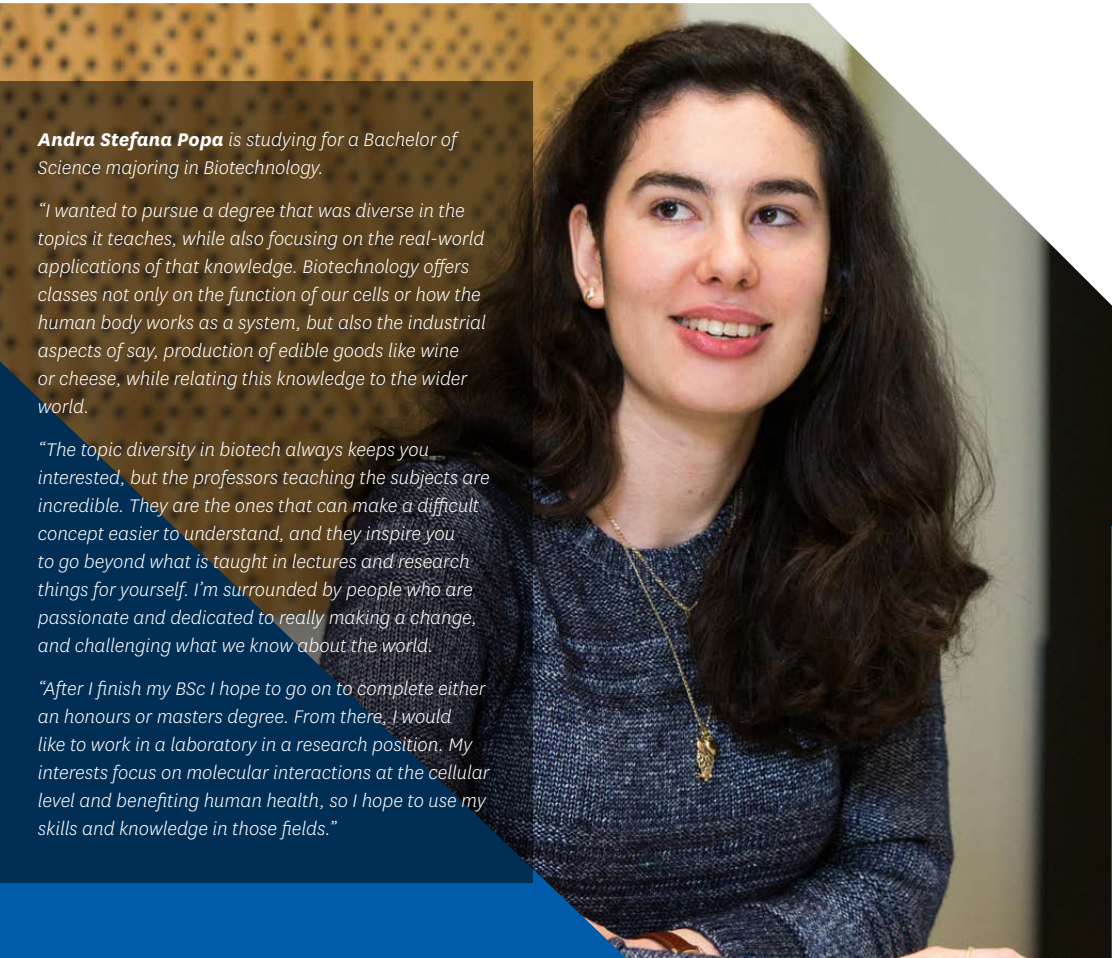
Careers in Biotechnology

The three-year BSc major in Biotechnology, followed by the one year BSc(Hons) in Biotechnology, provides students with an appropriate academic background for a professional career in the traditional and emerging biotechnology industries.

Standards are high, but career prospects are excellent. You will build a strong foundation in the biological and engineering basis of biotechnology, as well as learning about new technologies. Biotechnology is at the forefront of the knowledge economy, and is an excellent specialisation if you're interested in the commercialisation of cutting-edge science.

If you are looking to move straight into the workforce after your degree, you are likely to qualify for technical and research assistant positions within fundamental and applied research programmes such as:

- Biotechnology companies
- Brewing fermentation industries
- Crown Research Institutes
- Pharmaceutical companies
- Universities



Andra Stefana Popa *is studying for a Bachelor of Science majoring in Biotechnology.*

"I wanted to pursue a degree that was diverse in the topics it teaches, while also focusing on the real-world applications of that knowledge. Biotechnology offers classes not only on the function of our cells or how the human body works as a system, but also the industrial aspects of say, production of edible goods like wine or cheese, while relating this knowledge to the wider world.

"The topic diversity in biotech always keeps you interested, but the professors teaching the subjects are incredible. They are the ones that can make a difficult concept easier to understand, and they inspire you to go beyond what is taught in lectures and research things for yourself. I'm surrounded by people who are passionate and dedicated to really making a change, and challenging what we know about the world.

"After I finish my BSc I hope to go on to complete either an honours or masters degree. From there, I would like to work in a laboratory in a research position. My interests focus on molecular interactions at the cellular level and benefiting human health, so I hope to use my skills and knowledge in those fields."

Helpful information

Academic dates
www.auckland.ac.nz/dates

Academic Integrity Course
www.auckland.ac.nz/academic-integrity

Accommodation
www.accommodation.auckland.ac.nz

Buy coursebooks
www.science.auckland.ac.nz/resource-centre

Career Development and Employment Services
www.auckland.ac.nz/careers

Course advice and degree planning in Science
www.science.auckland.ac.nz/student-centre

General education
www.auckland.ac.nz/generaleducation

How to apply
www.apply.auckland.ac.nz

How to enrol
www.auckland.ac.nz/enrolment

International students
www.international.auckland.ac.nz

Māori and Pacific students
www.science.auckland.ac.nz/tuakana

Need help?
www.askauckland.ac.nz

Rainbow Science Network for LGBTI students
www.science.auckland.ac.nz/rainbowscience

Scholarships and awards
www.scholarships.auckland.ac.nz

Support for students
www.science.auckland.ac.nz/support

APPLICATIONS CLOSE ON 8 DECEMBER
Questions about Biotechnology?
scifac@auckland.ac.nz

Disclaimer
Although every reasonable effort is made to ensure accuracy, the information in this document is provided as a general guide only for students and is subject to alteration. All students enrolling at the University of Auckland must consult its official document, the University of Auckland Calendar, to ensure that they are aware of and comply with all regulations, requirements and policies.

THE UNIVERSITY OF AUCKLAND
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NEW ZEALAND

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