UNSW BIOINFORMATICS SOCIETY

2025

ACGT CAREERS GUIDE TO bioinformatics.

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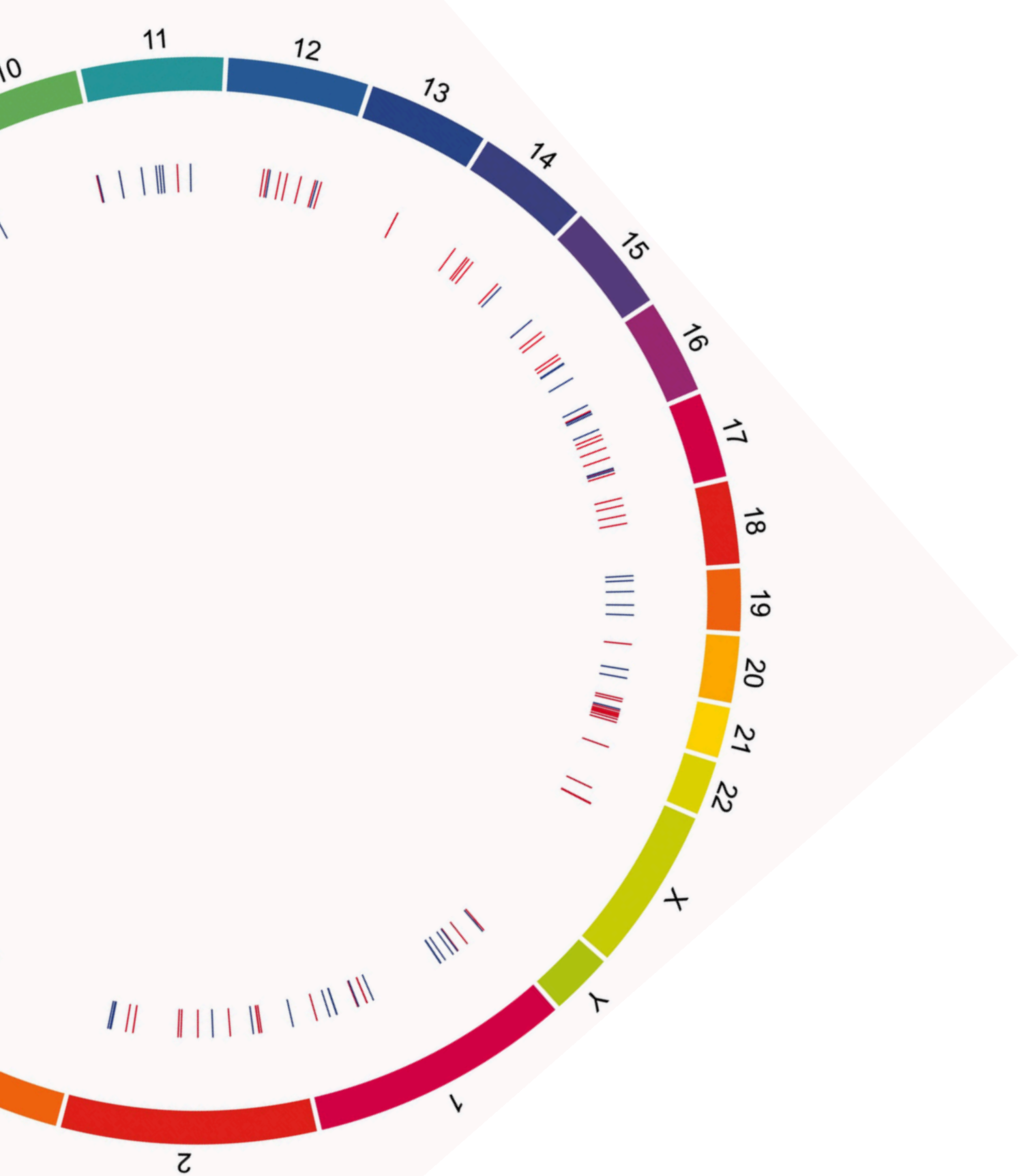

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IMAGE SOURCE:
Google Groups

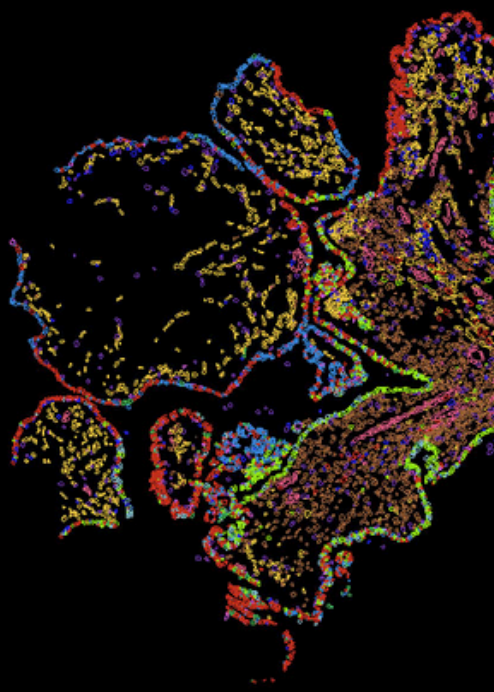
What is Bioinformatics

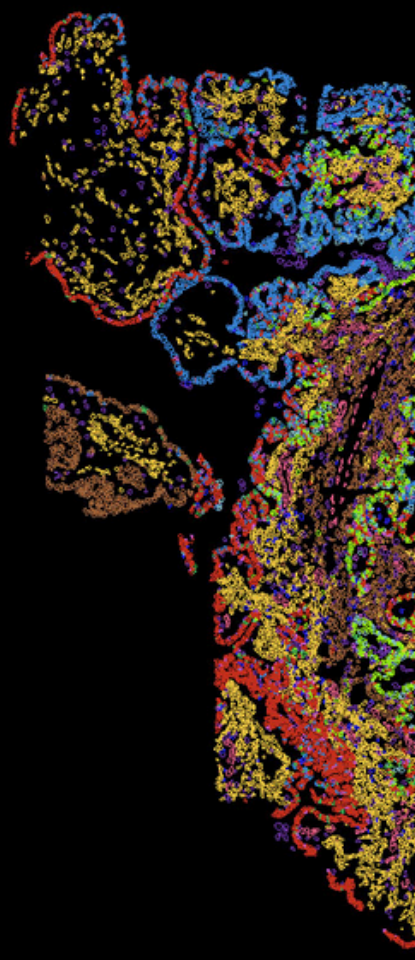
Bioinformatics is one of the most exciting fields on the forefront of innovation. Whilst the six-syllable word has most people scratching their heads, through this guide we aim to demystify the industry and highlight the opportunities available at UNSW to make the most out of your degree.

So what is Bioinformatics? Bioinformatics is a key discipline that applies the fundamentals of the life sciences, mathematics and engineering to computationally analyse and process the rapidly growing repository of information developed from genetics, biotechnology and biochemistry. At UNSW, through studying the core concepts of software and information technologies to extract, interpret, analyse and utilise data and genetic information, students apply the methods of computer science to achieve the goals of life sciences space.

Whether you are enrolled in the Science or the Engineering stream, or even if you are just interested in the sector, this guide will provide you with a comprehensive breakdown of what Bioinformatics looks like at UNSW, and the different paths that you can pursue as you begin your career.

ABOUT BINFSOC





The UNSW Bioinformatics Society (BINFSOC) is a student-run society for anyone interested in the exciting intersection of computer science and biology.

Founded in 2020, BINFSOC has grown substantially, establishing a large network of enthusiastic students and experienced academics within bioinformatics and the broader biotech community. Our society provides a platform to connect like-minded individuals, share knowledge, and support professional development.

Here is a overview of what we do at BINFSOC:

- Run social events from escape rooms to paint-and-sip nights, designed to bring our community together and build lasting friendships.
- We host workshops and revision sessions for bioinformatics-related subjects
- Organise networking events connect members with industry professionals and academics, providing valuable insights into the bioinformatics world.
- We provide mentoring programs to help students navigate their academic journeys in bioinformatics
- BINFSOC regularly publishes BINFSIGHTS, our newsletter, which provides updates on the latest developments in bioinformatics, highlights society news, and includes networking opportunities and tech tutorials!

Foreword.

The UNSW Bioinformatics Engineering degree is the longest running bioinformatics degree in Australia, and one of the longest-running undergraduate bioinformatics degree in the world. Graduates from the program have gone on to make their mark across the many areas covered by the field – scientific research, bioinformatics service provision, data science, software engineering, IT, as well as further afield.

Bioinformatics can be studied at UNSW as an engineering degree, with emphasis on the design and implementation of software systems for biomedicine, but also as a science major focusing on the application of these software systems to life sciences. Both degrees are rich in foundation courses as bioinformaticians must master both computing and life sciences, and therefore elective slots are precious – make sure you do not waste them! You can choose electives from computing and life sciences depending on your interests (and completed prerequisites) so think about the type of jobs you are aiming for when you graduate when planning which electives to take.

The degree includes a number of dedicated bioinformatics courses and it is worth understanding how they fit together. BINF2010 (Introduction to Bioinformatics) really aims to answer the question “what is bioinformatics?” so students understand early on what they have signed up for. The course takes you on the journey from biological problems to computational solutions to showcase the different subfields of bioinformatics. BINF3010 (Applied Bioinformatics) is designed as a practical course demonstrating how to use existing bioinformatics methods, with minimal coding, in contrast to BINF3020 (Computational Bioinformatics) that focuses on algorithms and statistics to illustrate the process of developing new bioinformatics methods.

Projects are also an important component of the degrees especially for the engineering degree which requires a thesis as well as industrial training. The design workshop course (DESN2000) is an important avenue for engineers to meet future supervisors and even employers, so, even though it is labelled as a level 2 course, it is important to leave this course till late enough in your degree that you have sufficient experience and skills to impress your project customer.

Some of the dedicated bioinformatics courses throughout the degree involve several guest lecturers working in specialised areas of bioinformatics. Many of these guest lecturers are available to supervise student projects for the thesis and for industrial training, so do not hesitate to contact them. Another common destination for thesis projects and industrial training are the various medical research institutes around Sydney who are often on the lookout for students with bioinformatics skills, and it can pay to be proactive and contact investigators in these institutes. In this context, make use of the networking opportunities provided by BINFSOC to get to know more senior students in the program as they often have made previous contact with potential supervisors and can provide suggestions.

Finally, don't limit yourself too much if you find it difficult to find a project. Bioinformatics is widely seen as a growing area bringing together some of the most exciting directions in science and technology but currently, it still can be a niche area. The bioinformatics engineering degree was deliberately designed to provide graduates with a wide range of skills, opening doors not just in life science research but also in a wide range of computing careers.

— Dr Bruno Gaeta

Head of UNSW Bioinformatics

COURSE COORDINATOR ADDRESS.

BINF2010
Introduction to Bioinformatics

Bioinformatics is a relatively new degree joining what can appear to be very different fields: life sciences, mathematics, and computing. However, as a discipline, bioinformatics has been around for nearly as long as computers have – as the first applications of computing to analysing protein data dates back to the 1960s.

BINF2010 is the first bioinformatics course in the bioinformatics programs and is also available as an elective or in some cases a general education course for students taking a biology-related major. As such, you will meet other students from across the university, with different backgrounds and skills. This course aims to provide clear foundational knowledge, and practical modern applications in research, technical, and industrial contexts.

The course surveys the major areas of bioinformatics, exploring the history of bioinformatics in relation to advances in computing hardware and software; the biological problems currently being addressed using bioinformatics; and future applications of bioinformatics.

Major topics include genomics; genome sequencing projects; proteomics; structural genomics; systems biology; phylogeny; medical informatics; and commercial applications of bioinformatics. The general nature of the data, computational problems and the approaches employed will be discussed in each case.

Bioinformatics will be discussed both as a scientific discipline and as an engineering discipline. The course will also explore the role of bioinformatics in the biotechnology and pharmaceutical industries and ethical issues associated with biological data.

Lectures are supplemented by practical exposure to public and commercial bioinformatics websites and to commonly used bioinformatics software.

Make sure to check out the course outline to get more details on specific learning objectives

How the course equips students with essential skills and knowledge in bioinformatics. The lectures are structured to emphasise the bioinformatics analysis process, set up as modules that roughly span a week.

Each lecture module starts with a discussion of the biology context, followed by a discussion of bioinformatics approaches, then of relevant computer science algorithms and current tools. Guest lecturers provide illustrations of applications in industry and current research.

Each module is complemented with computer laboratory work and quizzes that demonstrate and test the use of software and interpretation of outputs. Tutorials are used to introduce the programming languages used for general data manipulation and visualisation, and are designed to provide the necessary background to write your own code for the scripting assignment. Opportunities that students can explore after taking the course, both within and beyond academia.

As this is the introductory course, it is a prerequisite for the next set of bioinformatics courses. For those keen for biological applications, BINF3010 Applied Bioinformatics will provide a deeper coverage of the current applications in a variety of medical and biomedical research fields. BINF3020 Compu-tational Bioinformatics delves into the algo-rithms introduced in more detail – along with implementation to test your computing skills.

Hopefully, the introductory course will let you see the applications and relevance of bioinformatics in a wide range of fields and industries. Bioinformatics research, development, and service are highly sought after, and this course aims to expose you to all those aspects.

Bioinformatics is an adventure – it can lead you across many different paths, within many fields of research and across many industries. There is no dead-end! The best advised is therefore to keep an open mind! Finding what you enjoy (or don't!) is key to success. Try different things and do not silo yourself – and you will find this career to be rewarding.

— Dr Sara Ballouz

BINF2010 Course Coordinator

Course information.

Starting first year university is a little daunting and the different courses can be confusing, so here is an overview of what to expect when studying Bioinformatics. During First year, courses will be aimed to provide you with the fundamental knowledge for most Second and Third- year courses.

A bioinformatics student will study a range of courses like molecular and cell biology, chemistry, mathematics and computer science courses. If you have done science and maths subjects for HSC, a lot of topics will be revision and an extension of knowledge you already know.

The first biology course (BABS1201) will focus on cell structure and function. Chemistry courses (CHEM1011/CHEM1031) will be an extension from HSC chemistry and will involve learning about periodic trends, chemical bonding and interactions, equilibrium and thermodynamics. First year math courses include MATH1131/1141 and MATH1231/1241

However, if you did not study a science or math subject for the HSC, don't fret, as courses will either be taught assuming you have no prior knowledge, or there is a prerequisite course to take. Additionally there are plenty of support systems here at UNSW! BINFSOC provides student mentoring where we can guide through all support systems available!

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Peer Mentoring.

The Peer Mentoring Program run by UNSW BINFSOC is designed to create a supportive community where experienced students guide and assist their peers in navigating the challenges of university life. The program aims to help students thrive academically, socially, and personally.

The program facilitates smooth transitions for first-year students, helping them adapt to university life with ease. However, it is also open to students in other years of study, ensuring that all participants have the opportunity to benefit from the program's supportive structure and engaging activities.

Mentors and mentees will participate in a variety of events, including bonding activities, academic workshops, and more. These initiatives provide a space for personal growth, helping students, both mentors and mentees, develop essential skills such as communication, leadership, and interpersonal abilities. While it encourages forming and expanding friendships and connections in a relaxed and welcoming environment.

Open to all commencing undergraduate and postgraduate students with an interest in Bioinformatics, the program welcomes local and international students alike, as well as those pursuing single or dual degrees. By joining as a mentor or mentee, students can enrich their university experience and build a strong network within the BINFSOC community and beyond.

The engineering side of bioinformatics will require mathematics, engineering, and computer science courses.

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Engineering Stream

To access detailed information about each of the core courses as part of the Bioinformatic Engineering Degree, check out the Handbook - Bioinformatics Engineering.

While the maths is not extensive, it is enough to help you understand and appreciate a lot of the detail behind some methods and algorithms that are introduced in higher level computer science courses, alongside those applied in bioinformatics.

There are also some general core engineering courses which develop your design thinking, report writing, and project management skills. In these courses, you have the chance to use some of the standard technologies and practices adopted in engineering industries in general. In the past, these courses have been primarily project-based, with DESN1000 and DESN2000 being run separately across different engineering disciplines.

Level 1 Courses
MATH1131 / MATH1141 - (Higher) Mathematics 1A
MATH1231 / MATH1241 - (Higher) Mathematics 1B
MATH1081 - Discrete Mathematics
Level 2 Courses
MATH2801 / MATH2901 - (Higher) Theory of Statistics

For some mathematics courses there is an option to choose the higher equivalent in which the same content is taught, but at a greater level of detail.

The core maths courses will give you a theoretical background in calculus, linear algebra, statistics, and discrete mathematics, which will be applied throughout the core courses, as well as any computing electives you take down the line.

Table 1: Core MATH courses.

The DESN courses are a great opportunity to get in touch with other students in the Bioinformatics Engineering stream, as well as across all Engineering disciplines, and to be able to work on a term-long, project and apply the engineering practices and methodologies taught alongside. While second year students can enrol in DESN2000, it is recommended that you take the course in third year, given the computing knowledge assumed.

Project choices for DESN1000 may vary year to year, however, they are a good opportunity to become introduced to students within the cohort. The courses are designed to give first-hand experience to build key engineering skills, where designing is based on specified and open-ended problems, chosen with a team.

Level 1 Courses
DESN1000 - Introduction to Engineering Design and Innovation
Level 2 Courses
DESN2000 - Engineering Design and Professional Practice

Table 2: Core DESN courses.

Level 1 Courses	Level 2 Courses
COMP1511 (Programming Fundamentals)	COMP2041 (Software Construction: Techniques and Tools)
COMP1521 (Computer Systems Fundamentals)	COMP2511 (Object-Oriented Design & Programming
COMP1531 (Software Engineering Fundamentals)	COMP2521 (Data Structures and Algorithms

Level 3 Courses	Level 4 Courses
COMP3311 (Database Systems)	COMP4920 (Professional Issues and Ethics in Information Technology)
COMP3121 (Algorithms and Programming Techniques)	

Table 3: Core COMP courses.

In these courses, you will also be introduced to some universal concepts in programming that will help you to translate a problem into a solution in computer code. This is a very valuable skill for a bioinformatics engineer. These concepts are independent of the programming language you use in the course and can help you to quickly learn new programming languages that may be used in other courses.

It is useful to be aware that courses subsequent to COMP1511 focus less on how to code, but rather better ways to code, how coding works, and applications of coding, just to name a few.

Engineering Student Testimonies.

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Ever since I was first introduced to a computer, I’ve been a complete nerd for programming and computing. As I grew older science really became my primary interest and I realised there was a way to combine both sides of science and computing through bioinformatics. So far, it’s been exactly as I hoped, computing classes, mixed with wet and dry lab science.

My advice for students wanting to pursue bioinformatics is to absolutely do it if you’re interested in science or software engineering or a combination of both and want a more specialised career path.

One particular program that stood out to me was the career mentoring program which was amazing, and helped develop my career path and job seeking skills. The entire program really stands out, it has both biology and computer science classes which really appeal to me.

Wildlife genomics is something I am passionate about, I love animals, and bioinformatics allows us to both establish contact with wild animals as well as experiment and learn about what they are made up of and how that affects them.

KERRY ZHAO

BACHELOR OF ENGINEERING (BIOINFORMATICS)

”

I chose bioinformatics engineering because of its multidisciplinary nature, combin-ing biology, computer science, and statistics. This diverse skill set opens doors to a wider range of careers spanning from pharmaceuticals to data science. My experience whilst studying bioinformatics has been extremely rewarding.

I’ve gained hands-on experience in programming languages like Python and R, along with a strong foundation in genomics and data analysis. By learning to bridge computational methods with biological data, this course has equipped me with versatile skills for tackling real-world scientific problems.

I appreciated bioinformatics not just for a specific course, but for its unique blend of biotechnology and computer science. This combination allowed me to engage in hands-on units like BABS2204 (Genetics) while also exploring more intuitive and programming-intensive units like COMP2521 (Data Structures and Algorithms). The balance between practical lab work and computational problem-solving made my learning experience both dynamic and enriching.

One resource that stands out to me is the Peer-Assisted Study Sessions (PASS) because they help break down complex concepts and take you through course content a lot more efficiently. This becomes really handy, especially during exam time or if you’re behind on a couple of lectures.

GURU VENKATESWARAN

BACHELOR OF ENGINEERING (BIOINFORMATICS)

The Science stream of Bioinformatics requires less computer science courses

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Science Stream

Although studying Bioinformatics through the Engineering and Science Faculty have many similarities, when undertaking Bioinformatics as a major in Science, you are able to focus more on the underlying biological theory in the field, and less on the computational applications. This is reflected in the different mandatory courses required of students enrolled in the Science faculty. As of 2024, you can major in Bioinformatics through the following programs:

- Bachelor of Science / Bachelor of Science (Honours)
- Bachelor of Advanced Science (Honours)

With all related double degrees.

The structure for all of these courses are quite similar. However, let's dive deeper into one degree to get a gist of what you might expect!

Bachelor of Science (with and without honours)

TYPICAL DURATION: 3 years + 1 year (if you plan to take Honours)

STRUCTURE: You can choose to do a single or double degree. For both types, there are 26 majors to choose from including **Bioinformatics**. You can choose 1-2 majors or 1 major and 1-2 minors.

Single Degree	
12 courses related to your major of choice (72 UOC*)	4 Free Elective courses (24 UOC)
6 Science Elective courses (36 UOC)	2 General Education courses (12 UOC)

Double Degree	
12 courses related to your major of choice (72 UOC*)	4 Science Elective Courses (24 UOC)
4 Free Elective courses (24 UOC) for your other degree	Your second degree

Table 4: Program structure for a single VS double degree.

Please note that if you do decide to take a double degree in Science and Engineering, you will be unable to major in Bioinformatics for BOTH programs. Only one program is allowed.

The science side of bioinformatics will enable you to explore various fields during your first year at uni and eventually help you to find your niche in second and third year. Similar to the Bachelor of Engineering degree, you will study the same core mathematics courses, as seen in Table 1.

However, in the Science major there are no compulsory engineering courses, and only two compulsory computational courses, namely COMP1511 and COMP2041. Distinct courses that you will take as a Science major are included in Table 5.

Level	Course Code	Course Name
1	BABS1201	Molecules, Cells and Genes
1	CHEM1011/CHEM1031	Chemistry 1A or Higher Chemistry 1A
2	BIOC2201	Principles of Molecular Biology (Advanced)

It's a good idea to explore as many options as earlier into your degree. By the end of the first year, you will have the chance to declare your major and will be able to change it throughout your degree. However, it is best to explore early so you don't end up taking additional courses!

Table 5: Core science courses.

Along with this, there are a multitude of science courses to choose from (listed on page 26) throughout your degree, giving an opportunity to explore personal interests within your major.

Level	Course Code	Course Name
2	BINF2010	Introduction to Bioinformatics
3	BINF3010	Applied Bioinformatics
3	BINF3020	Computational Bioinformatics

You will also have the opportunity to complete bioinformatics-specific courses.

Table 6: Core bioinformatics courses.

It's also a good idea to plan our your degree. Click on this link to see a sample degree template: Bachelor of Science (Major in Bioinformatics) and for other science degrees, click here: UNSW Science Undergraduate.

To access detailed information about each of the core courses as part of the Bioinformatics Science Degree, check out the Handbook - Science (Bioinformatics).

Science Student Testimony.

I chose a Bachelor of Science with a major in Bioinformatics and minor in Molecular Biology, as it offered me the flexibility to study two disciplines in one degree, rather than just sticking to one.

My experiences in both labs and courses have been extremely rewarding. From taking courses like COMP1511, MATH1131, and BABS2264, I've had the chance to explore diverse aspects of this field.

A standout course for me was definitely BINF2010, which introduced me to the data analysis side of bioinformatics. Through programs like Uniprot, EMBL, BLAST and PDB, and computational analysis using R and Python, I experienced firsthand how multiple disciplines come together to derive meaningful scientific information.

My advice for students interested in pursuing bioinformatics is to never be afraid to explore your curiosity, whether it's developing bioinformatics software, using algorithms to analyse data, or discovering new proteins,

Bioinformatics is a vast field with countless opportunities, so don't hesitate to explore all the options available to you as you never know what may interest you!

HAFSA FAHAD

BACHELOR OF SCIENCE (BIOINFORMATICS)

General Double Degree Experience and Advice

A double degree is a chance to learn more about two areas of interest without having to endure the length of two individual single degrees, which provides you with a breadth of knowledge across a wider range of skills and fields (and less HECS than two individual degrees!).

I am in my 4th year now at UNSW where I am completing a Bachelors of Commerce/Science, majoring in Behavioral Economics and Climate Systems respectively. I've found that this combination of degrees has led me to pursue a career in the Environmental Economics industry, which is a growing area of employment related to climate forecasting that would not be available to me without my double degree.

Beyond opening doors to more opportunity, double degrees are very beneficial when it comes to finding graduate employment because they allow you to stand out from other grads who may have only one of either your degrees and highlights to prospective employers the value that you can offer.

Personally I found it very difficult initially to decide what field to pursue in my tertiary studies but it was comforting to pick a combination of degrees that was allowed me to choose two different majors that captured my interests. Uni is about following your passions and I think this opportunity is enhanced by the double degree program.

DEON ARGIRATOS

BACHELOR OF COMMERCE/BACHELOR OF SCIENCE

Its difficult navigating when to study which courses.

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Timelines of Completion

Navigating when to study the right courses, particularly considering minimum units of credit required and prerequisites can be difficult. To ease the decision-making process, refer to one of the recommended timelines of completion of each degree type..

Disclaimer: The progression of a degree and the courses taken are always subjected to change, so this should always be confirmed in regard to the handbook.

Engineering.

First Year	Second Year
• BABS1201 • COMP1511 • COMP1521 • COMP1531 • DESN1000 • CHEM1011/CHEM1031 • MATH1131/MATH1141 • PHYS1111/PHYS1121/PHYS1131	• MATH1231/MATH1241 • MATH1081 • BINF2010 • BIOC2201 • COMP2041 • COMP2511 • COMP2521 • DESN20000

Third Year	Fourth Year
• MATH2801/MATH2901 • BABS2202/BABS2204/BABS2264/ BIOC2101/MICR2011 • BABS3121 • BINF3010 • BINF3020 • COMP3121 • Industrial Training (0 credits)	• COMP3311 • COMP4920 • COMP4951 • COMP4952 • COMP4953 • Discipline Elective • Discipline Elective

Science.

First Year

- SCIF0000 (0 Credits)
- SCIF1000
- BABS1201
- COMP1511
- CHEM1011/CHEM1031
- MATH1131/MATH1141
- MATH1231/MATH1241
- Free Elective

Second Year

- BINF2010
- BIOC2201
- COMP2041
- BABS2202/BABS2204/BABS2264/BIOC2101/MICR2011
- MATH2801/MATH2901
- General Education
- Free Elective
- Employability Experience

Third Year

- BINF3010
- BINF3020
- BABS3021/BABS3081/BABS3121/BABS3281/BABS3291/BABS3151/BIOC3111/BIOC3271/BIOC3271/BIOC3671/MICR3621
- General Education
- Free elective
- Employability Experience
- SCIF3010 (0 Credits)

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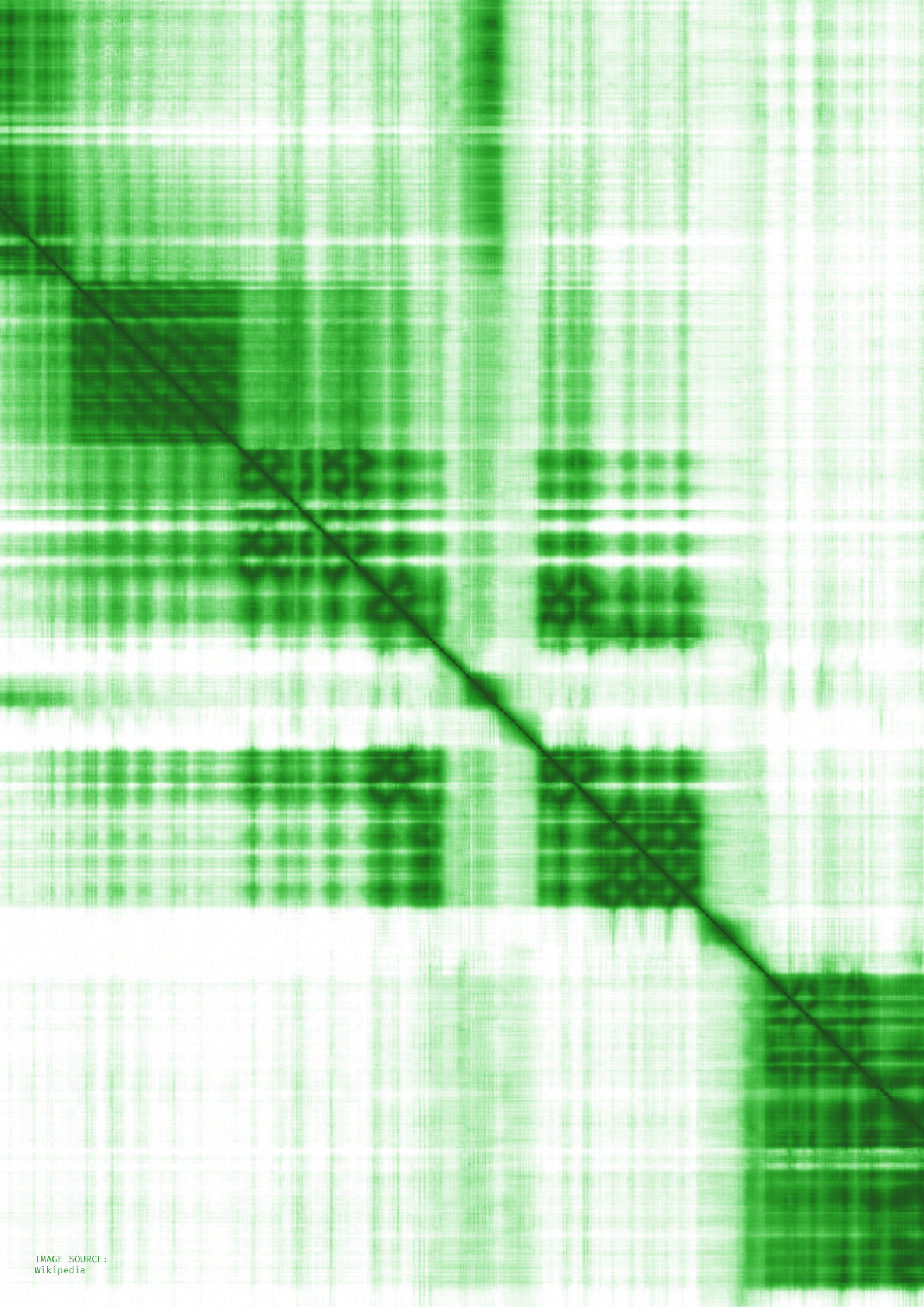

IMAGE SOURCE:
Wikipedia

Recommended core courses and electives.

Throughout your degree, you will often be able to choose your own core courses or electives to study. If you're not sure how to go about this process, use the below guide to recommend potential electives based on your enjoyment of the mandatory subjects that you will have already studied.

If you liked **BABS1201** Molecules, Cells and Genes

Topic	Course Name
Cell Biology Cell Architecture	BABS3081 Bacteria and Disease
Genetics (Gene expression, Law of inheritance, population genetics)	BABS2204 Genetics

If you liked **BIOC2201** Principles of Molecular Biology (Advanced)

Topic	**Course Name**
Nucleic Acids DNA Replication PCR Transcription/Translation Recombinant Techniques Stem Cells	BABS3121 Molecular Biology of Nucleic Acids BABS3281 Molecular Frontiers BABS3061 Medical Biotechnology
Protein Structure	BIOC3111 Molecular Biology of Proteins
Gene Expression	BABS2204 Genetics
Overall	BIOC3271 Molecular Cell Biology 2 BIOC3261 Human Biochemistry

Q: What is the basic unit of a protein?

If you liked **BABS2204** Genetics

Topic	Course Name
Population Genetics Evolution of Genes and Traits	BABS3291 Genes, Genomes and Evolution
Overall	BABS3201 Microbial Genetics BABS3151 Human Molecular Genetics & Disease

If you liked **MICR2011** Microbiology 1

Topic	Course Name
Microbes in Biotechnology and Synthetic Biology	BABS3200 Synthetic Biology
Virology	MICR3061 Viruses and Disease
Environmental Microbiology Microbial Processes and Interactions	MICR3071 Environmental Microbiology

If you are interested in **Biotechnology:**

Course Name	Course Name
BABS3031 Biotechnology and Bioengineering	Covers bioprocessing and economic principles involved in the operation, development, and design of large-scale biotechnology-based processes
BABS3071 Commercial Biotechnology	Covers aspects of biotechnology that are critical in the industry such as funding for R&D and Intellectual Property.

A: Amino acid

If you liked:

Course	Elective Suggestions
COMP1521	COMP3231 Operating Systems
COMP1531	COMP3511 Human-Computer Interaction COMP6080 Web Front-End Programming
COMP2041	COMP6714 Information Retrieval and Web Search COMP3141 Software System Design and Implementation
COMP2511	COMP3131 Programming Languages and Compilers
COMP2521	COMP3411 Artificial Intelligence COMP3153 Algorithmic Verification
COMP3121	COMP4121 Advanced Algorithms COMP4128 Programming Challenges COMP6741 Algorithms for Intractable Problems
COMP3311	COMP9315 Database Systems Implementation

Progression Check.

A **Program Progression Check** is a formal confirmation of academic progress. It advises students on the courses remaining to meet program requirements. This service is recommended for students in their final year (approaching graduation), to ensure they are on track for graduation. You can also utilise Program Checklists/Progression Checksheets as an alternate method of tracking the remaining courses that you need to complete.

If you submit a Program Progression check, expect to receive a response within approximately 5 working days.

How to apply for a Program Progression Check?

1. Login to the UNSW Student Portal Web Forms website at https://portal.insight.unsw.edu.au/ppc/

2. Follow the steps to complete the form

Note: If completing a Double Degree, you may select which faculty your request will be sent to.

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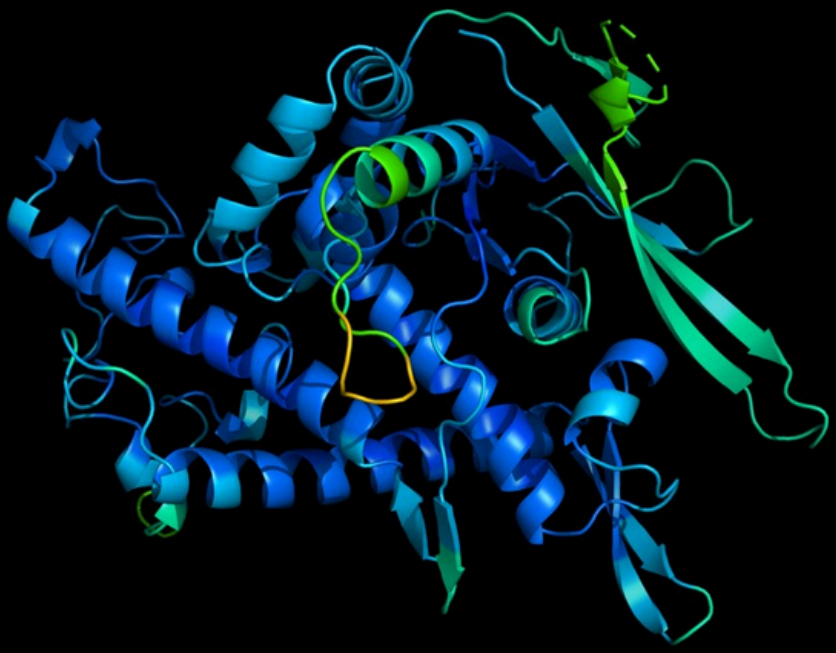


Transferring Streams.

Once you get the chance to immerse yourself in the university culture and undergo a few courses, you may feel that the degree or major that you chose no longer interests you. So, what if you would like to change streams or majors? No worries. Just follows these steps:

How to apply for a Stream Transfer?

1. After logging into myUNSW , find **Specialisation Declaration** on the left hand side of the screen and under the **Online Services** heading.
2. Once you click on the heading, another page should load. From here, you will be able to view your current stream. Now all you have to do is click "**Change Streams**".

Where can I change my stream?

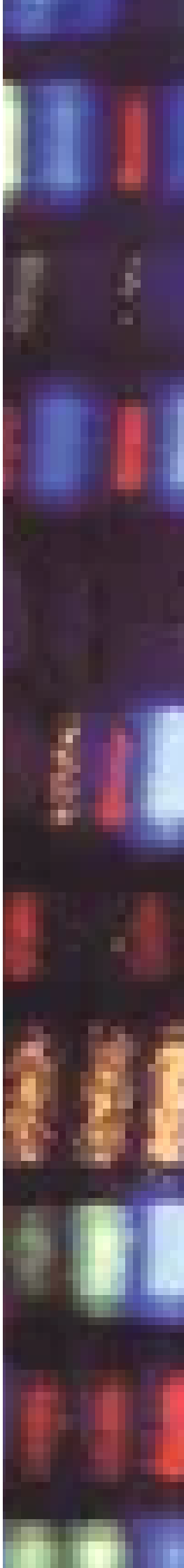
You can change your stream whenever you like except from the start of Week 4 till Census date of the current trimester. If you are about to graduate, then you are no longer eligible to change your stream.

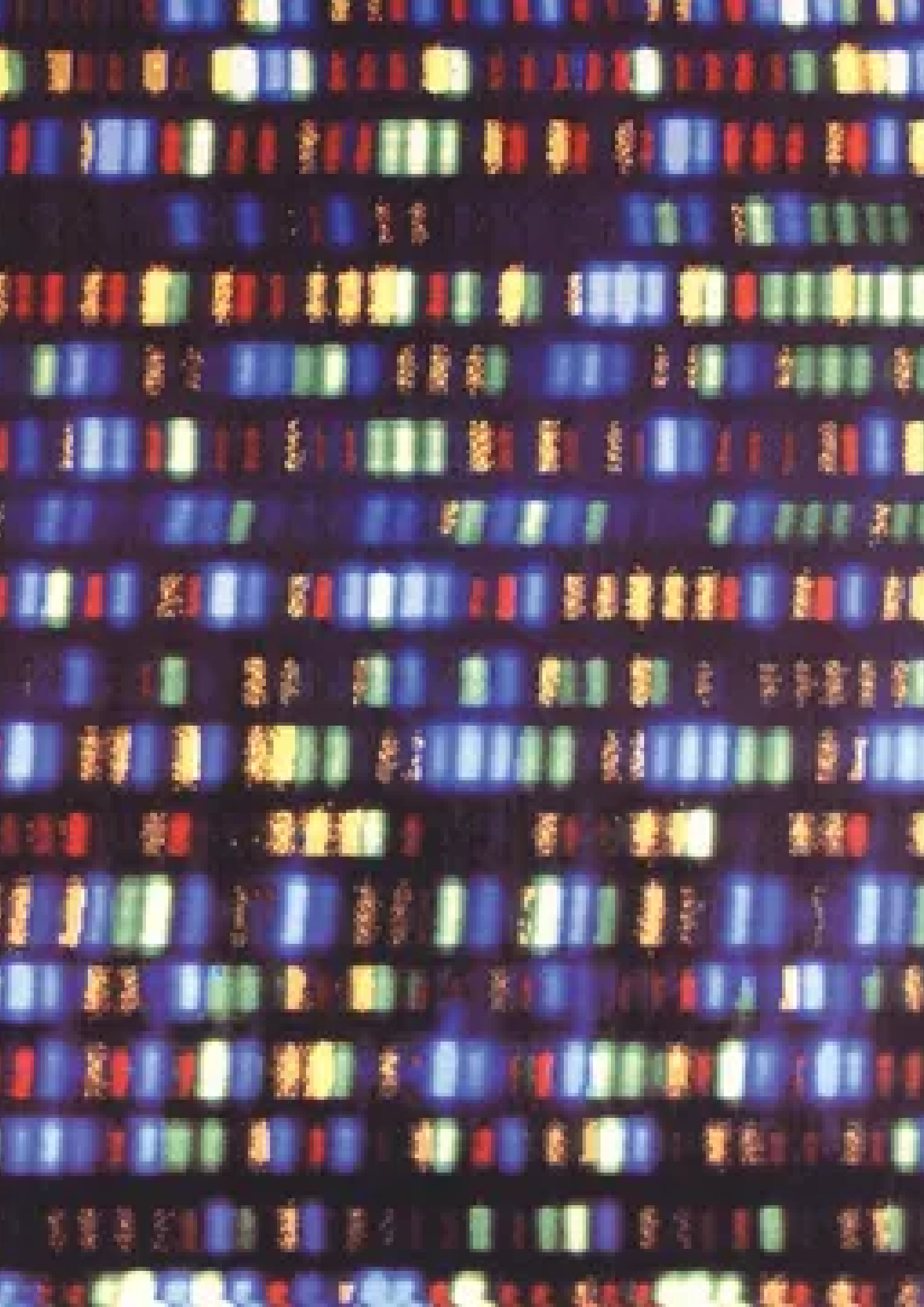
What streams do my program offer?

To check for this, it is a good idea to check your faculty Stream Information Declaration Page. Note that not all Science programs are included in the Stream Declaration Service. If it is not included, you will need to submit a Major Declaration form. You can also consult your handbook and Program Authority for more information. Some useful links: Student Nucleus Hub and Current Students.

IMPORTANT NOTE

Students are not permitted to take the Science Bioinformatics Major (BINFB1) when taking double degree 3767 Bachelor of Engineering, if they plan to take the Engineering Bioinformatics Major (BINFAH).





Exchange

How exchange works

If you choose to undertake an exchange program, you will continue to be enrolled as a full time student at UNSW. The credits (up to a maximum of 24 credits per half year) that you gain during exchange will be added to your UNSW degree. However, the mark is not added to your Academic Transcript, rather you get a satisfactory grade. Additional time is not added to your degree for undertaking exchange.

If you are interested, you are required to join the Moodle page (join at https://www.student.unsw.edu.au/exchangetutorial), where you will have access to the important dates related to exchange, in addition to a software that matches the courses offered in partner universities to their UNSW-equivalent. As the application process takes roughly nine months from when you start planning your exchange until you leave, it's best to plan a year in advance.

Costs

On exchange, you are required to pay for accommodation, travel and food. It is recommended by the Student Exchange UNSW team that you have at least $3500 available per month. If you have a scholarship or traineeship, these will most likely continue when you are on exchange, but best to discuss this matter with your sponsoring body to confirm the details.

Generally, you are not expected to pay tuition to the partner university, instead you will continue to pay UNSW. However, some universities may have additional costs that need to be satisfied.

Additionally, there may be scholarships and financial assistance available. These are awarded on the basis of merit and usually confirmed after nomination to an exchange partner university. If you already have a scholarship or traineeship, it's best to contact your sponsoring body about any conditions that may affect your exchange application.

Eligibility

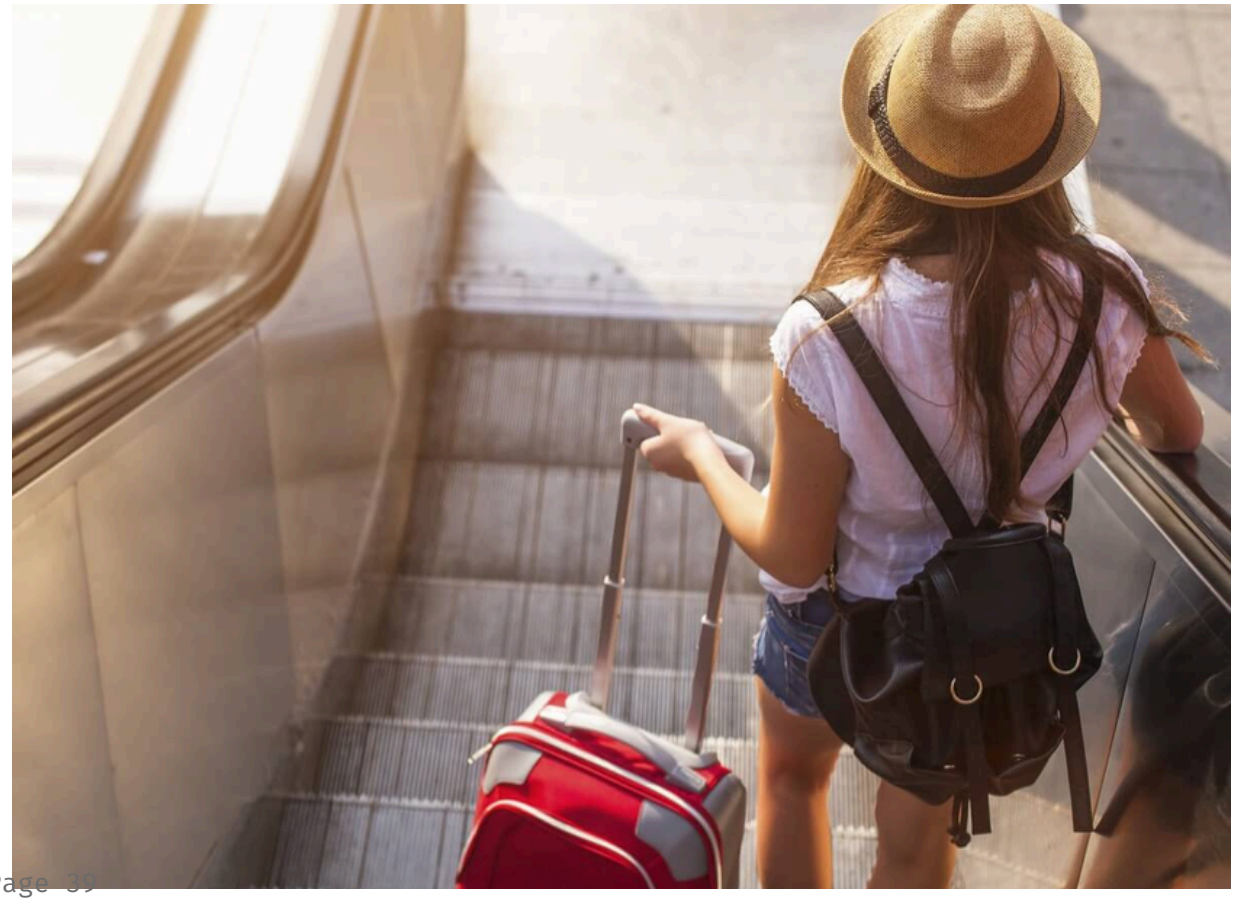
General requirements:

- Need to have at least a credit (65+) average WAM, although some universities may have a higher requirement. If your WAM is below a credit average, it is highly recommended to talk to Exchange Advisors. (https://student.unsw.edu.au/globalcontacts)
- Have at least 18UOC remaining in your degree at the start of your exchange program
- Only exchange to a UNSW partner institution
- If language proficiency is required, you need to have studied the language for at least 2 years at a university level. You may be eligible if you have studied the language significantly outside of university or at a high school level. Some universities may require you to sit a language proficiency test prior to exchange.

Still interested? Check out the Exchange Expo

On Thursday 10 April 2025, the UNSW Exchange Expo is open to all UNSW Sydney students and is a great opportunity to speak with exchange partner representatives, exchange students, and returned UNSW students.

Register at https://events.humanitix.com/unsw-exchange-expo.



Exchange Student Testimonies.

Career Insights and Advice

My six-month exchange program was an unforgettable and thrilling journey. I embarked on this adventure to travel, embrace new cultures, meet incredible people, and of course to have some fun!

I chose the University of Manchester for my exchange, but I highly encourage anyone considering an exchange program to dive in, no matter where you go. During my time there I enrolled in fascinating courses like Green Biotechnology and Organismal Genetics, which easily transferred as elective BABS courses.
Tips:

- **Course Matching:** Try to match as many courses as possible in your exchange application. This will reduce stress in case of full classes or timetable clashes.
- **Get Involved:** Attend orientations, social events, and join a club or society. These are the best ways to meet new friends, immerse yourself in the culture, and have loads of fun.

During my exchange, I found a refreshing balance between studying, socialising, and traveling. This experience helped me grow in so many ways—fostering independence, broadening my perspective, and exposing me to new ways of learning science and engineering.

If you're on the fence about doing an exchange program, I hope this inspires you to take the leap. It's an opportunity you won't regret!

— **Jaime Taitz**

BIOINFORMATICS EXCHANGE STUDENT

Singapore Exchange Student

“

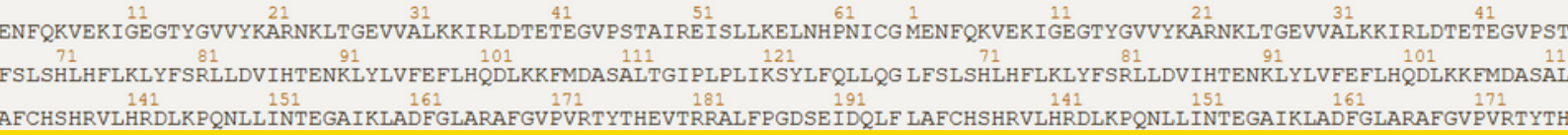
Exchange is the perfect way to experience living instead of just visiting a country while you are still a student. It’s an opportunity to immerse yourself in a different culture, put yourself out of your comfort zone and make unique memo-ries. No one I’ve talked to has ever regretted their exchange which I think says a lot!

My biggest tip: as the UNSW BINF courses are quite specific i.e. BINF2010, BINF3010, BINF3020 I would not rec-ommend doing them on exchange as the material in these courses are cumulative. You have no idea if the host univer-sity you go on exchange will teach the same material as in our BINF courses. I would also avoid the same for subjects that are prerequisites for later courses unless you are pre-pared to have a bit of a learning curve when doing said later courses. The best subjects to do on exchange are your elec-tives! e.g. the four discipline electives COMP/BABS3xxx or higher, and BABS electives and GENEDs.

If you’re up for a little bit of organising and hunting for op-portunities, doing an internship or being a summer research student overseas would also be a great experience and help fulfill your industrial training requirements for engineering stream students. This would require you to make sure your exchange period lines up with the summer break of your host university, and of course make it back in time for term start at UNSW at the conclusion of your exchange.

”

Chelsea Liang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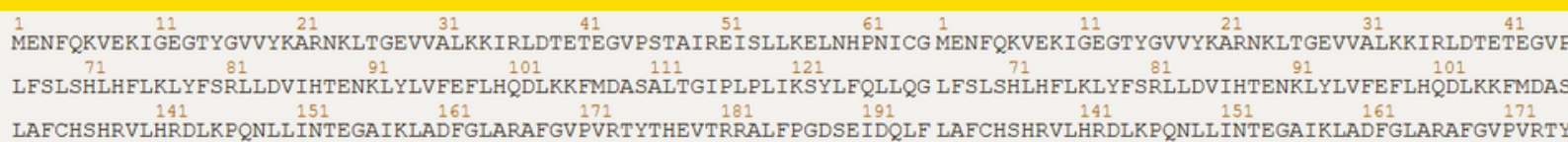
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Bioinformatics Course Specific Exchange Program.

Compiled below is a list of equivalent courses offered at partner universities (most not all, more can be found at https://www.student.unsw.edu.au/partners). Some UNSW courses do not have corresponding courses offered at partner universities if your target partner university is not listed, we recommend course matching using the Moodle exchange course guideline mentioned above.

Level 1 Core Courses

COMP1511 - Programming Fundamentals

Location	Relevant Courses
University of California, USA	PIC 10A: Introduction to Programming

COMP1521 - Computer System Fundamentals

Location	Relevant Courses
University of Pennsylvania, USA	CIS240: Computer and Information Science
University of Florida - Warrington College of Business Administration, USA	CDA3101: Introduction to Computer Organisation
Shanghai Jiaotong University, China	EI338: Computer Systems Engineering
Nanyang Technological University, Singapore	CZ1006: Computer Organisation and Architecture
Georgia Institute of Technology, USA	CS2110: Computer Organisation and Programming

COMP1531 - Software Engineering Fundamentals

Location	Relevant Courses
Shanghai Jiaotong University, China	EE312: Software Engineering
Nanyang Technological University, Singapore	CZ2006: Software Engineering

BABS1201 - Molecules, Cells and Genes

Location	Relevant Courses
University of Florida - College of Engineering, USA	BSC2010: Integrated Principles of Biology 1 BSC2010L: Integrated Principles of Biology I Laboratory
University of Birmingham, UK	03 23318: LC Cell Biology & Physiology
Swansea University, UK	BIO108: Molecular and Evolutionary Biology
Pennsylvania State University, USA	BME201: Fundamentals of Cells and Molecules
Norwegian University of Science & Technology, Norway	BI3016: Molecular Cell Biology
National University of Singapore, Singapore	LSM1106: Molecular Cell Biology BG1131: Molecular Cell Biology for Biomedical Engineers
McGill University, Canada	BIOL112: Cell and Molecular Biology
Georgia Institute of Technology, USA	BIOL1510: Biological Principles
Drexel University, USA	BIO122: Cell and Genetics
Akita International University, Japan	BIO100: Introduction to Biology BIO105: Biology Laboratory

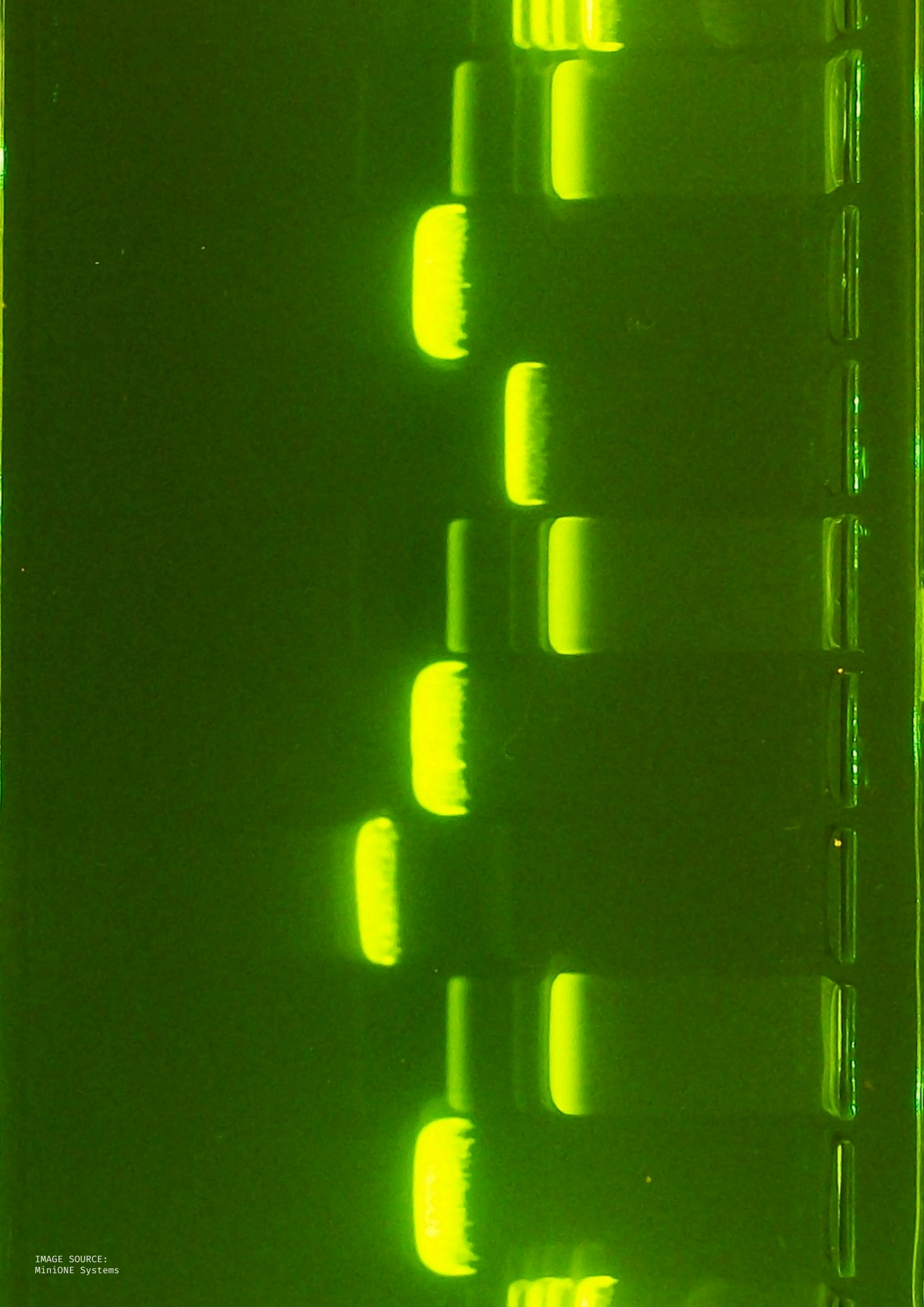

IMAGE SOURCE:
MiniONE Systems

MATH1081 - Discrete Mathematics

Location	Relevant Courses
University of Virginia, USA	CS2102: Discrete Mathematics
University of Edinburgh, UK	INFR08023: Discrete Mathematics and Mathematical Reasoning
University of Connecticut, USA	MATH1031Q: Elementary Discrete Mathematics
Western University, Canada	CS2214A: Discrete Structures for Computing
University of Pennsylvania, USA	MATH340: Discrete Mathematics I
University of Michigan, USA	EECS203: Discrete Mathematics
University of Colorado, Boulder, USA	MATH2001: Introduction of Discrete Mathematics APPM3170: Discrete Applied Mathematics

DESN1000 - Introduction to Engineering Design and Innovation

Location	Relevant Courses
McGill University, Canada	MECH289: Design Graphics
GE3 - DTU - Technical University of Denmark (Engineering only), Denmark	41603: Engineering Design and Problem Solving

CHEM1031 - Higher Chemistry 1A: Atoms, Molecules and Energy

Location	Relevant Courses
Georgia Institute of Technology, USA	CHEM1310: General Chemistry

CHEM1011 - Chemistry 1A: Atoms, Molecules and Energy

Location	Relevant Courses
University of North Carolina at Chapel Hill, USA	CHEM101: General Descriptive Chemistry I CHEM101L: Quantitative Chemistry Laboratory 1
University of Edinburgh, UK	CHEM08016: Chemistry 1A
Purdue University, USA	CHM11100: General Chemistry CHM11500: General Chemistry
Pennsylvania State University, USA	CHEM110: Chemical Principles I CHEM111: Experimental Chemistry 1
University of Pennsylvania, USA	CHEM100: Introduction to General Chemistry
Rensselaer Polytechnic Institute, USA	CHEM1101: Chemistry I
University of Colorado, Boulder, USA	CHEM1211: General Chemistry for Engineers CHEM1221: Engineering General Chemistry Lab
Ewha Woman's University, South Korea	20416: General Chemistry 1 20418: General Chemistry: Laboratory Work I

PHYS1121 - Physics 1A

Location	Relevant Courses
Western University, Canada	Physics 1301A: Introductory Physics

MATH1131 - Mathematics 1A

Location	Relevant Courses
Iowa State University, USA	MATH1600: Survey of Calculus MATH2070: Matrices and Linear Algebra

Level 2 Core Courses

BIOC2201 - Principles of Molecular Biology (Advanced)

Location	Relevant Courses
Iowa State University, USA	BIOL313: Principles of Genetics BIOL313L: Principles of Genetics Laboratory
University of Sussex, UK	C7004: Molecular Biology
University of Ottawa, Canada	BCH3170: Molecular Biology BCH3356: Molecular Biology Laboratory
University College Dublin, Ireland	BIOC20050: Principles of Biochemistry BMOL20060: Biomolecular Lab Skills 1 BMOL20090: Molecular Genetics and Biotech
Nanyang University of Singapore, Singapore	LSM3262: Environmental Animal Physiology LSM2191: Lab techniques in life sciences LSM2232: Genes, Genomes and Biomedical Implications
McGill University, Canada	BIOL200: Molecular Biology
Kyoto University, Japan	Intbiochem: Introduction to Biochemistry-E2 Basic geneng: Basic Genetic Engineering
Dalhousie University, Canada	BIOL2030: Genetics and Molecular Biology
Chuo University, Japan	236: Molecular Genetics 239: Experimental Courses in Molecular Genetics 4749: Foundations of Molecular Biology

COMP2041 - Software Construction: Techniques and Tools

Location	Relevant Courses
University of Pennsylvania, USA	CIS191: Using and Understanding Unix and Linux CIS192: Python Programming
University of Edinburgh, UK	INFR08008: Informatics 2A - Processing Formal and Natural Languages

COMP2521 - Data Structures and Algorithms

Location	Relevant Courses
University of Pennsylvania, USA	CS121: Programming Languages & Techniques II CS121: Data Structure and Algorithms
University of Edinburgh, UK	INFR08009: Informatics 2B - Algorithms, Data Structures, Learning
University of Florida - Warrington College of Business Administration, USA	COP3530: Data Structures and Algorithms
Shanghai Jiaotong University, China	CS222: Design and Analysis of Algorithms
Nanyang University of Singapore, Singapore	EE2008/IM1001: Data Structures and Algorithms
Western University, Canada	CS2121B: Data Structures and Algorithms / Problem Solving: Programming
University of Toronto, Canada	CSC263H1: Data Structures and Analysis

COMP2511 - Object-Oriented Design and Programming

Location	Relevant Courses
University of Pennsylvania, USA	EAS203: Engineering Ethics CIS350: Software Design & Engineering
University of Edinburgh, UK	INFR08014: Informatics 1 - Object-Oriented Programming
Georgia Institute of Technology, USA	CS1331: Introduction to Object-Oriented Programming CS2340: Objects and Design
CentraleSupélec, France	IS1220: Object-Oriented Software Design
Nanyang University of Singapore, Singapore	CS2113: Software Engineering & Object-Oriented Programming CZ2002: Object-Oriented Design and Programming
Western University, Canada	CS3307A: Object-Oriented Design and Analysis

MATH2801/MATH2901 - Theory of Statistics

Location	Relevant Courses
University of North Carolina at Chapel Hill, USA	STOR435: Introduction to Probability STOR155: Introduction to Data Models & Inference
University of Copenhagen, Denmark	NMAK14029U: Statistics and Bioinformatics and eScience (StatBI/E)
University of Illinois at Urbana-Champaign - College of Engineering, USA	STAT400: Statistics and Probability I
University of British Columbia, Canada	STAT251: Elementary Statistics
Pennsylvania State University, USA	MATH415: Introduction to Mathematical Statistics

Level 3 Core Courses

BINF3010 - Applied Bioinformatics

Location	Relevant Courses
🇰🇷 Korean Advanced Institute of Science and Technology (KAIST), South Korea	BiS438: Bioinformatics CS476: Collective Intelligence in Biomedical Applications

COMP3121 - Algorithms and Programming Techniques

Location	Relevant Courses
🇺🇸 University of Pennsylvania, USA	CIS320: Introduction to Algorithms
🇺🇸 University of Michigan, USA	EECS586: Design and Analysis of Algorithms
🇨🇦 Western University, Canada	CS3340B: Analysis of Algorithms I
🇨🇦 Western Toronto, Canada	CSC373H1: Algorithm Design, Analysis & Complexity
🇬🇧 University of Edinburgh, UK	INFR10052: Algorithms and Data Structures

... 🔎And many more

ORIGIN

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Careers

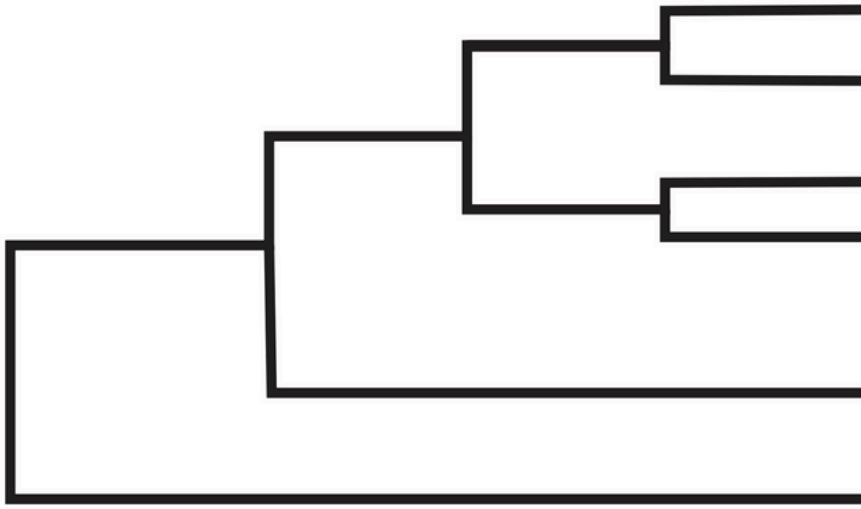
Whilst course work prepares you academically for the Bioinformatics field, the best way to gain hands-on experience is through undertaking internships and research projects. Breaking out into industry can be a difficult process, and requires you to develop an array of professional skills. With Bioinformatics covering a wide range of disciplines, there are a number of different roles that you can enter as a Bioinformatician, some of which include:

> BIOINFORMATICS SPECIALIST

A bioinformatics specialist collects, manages and analyzes biological and biochemical data by using computer software. They mainly focus on analyzing DNA and molecular data. They also develop complex mathematical algorithms to analyze and categorize the data gathered.

> BIOINFORMATICS PROGRAMMER

A bioinformatics programmer creates living materials algorithms. They are responsible for administering sequencing and other computational algorithms to produce accurate interpretations of biological data. Creating tools to track these sequences is another duty of a bioinformatics programmer.



Coordinating with other programmers, designing scripts for extensive data, training junior analysts and noting technical issues are also basic responsibilities.

> BIOINFORMATICS SPECIALIST

A bioinformatics specialist collects, manages and analyzes biological and biochemical data by using computer software. They mainly focus on analyzing DNA and molecular data. They also develop complex mathematical algorithms to analyze and categorize the data gathered.

> RESEARCHER

Researchers are responsible for collecting, organizing, and analyzing opinions and data to solve problems, explore issues, and predict trends. They may specialize in different areas such as sociology, medicine, psychology, science, among other fields.

> BIOLOGIST (WET LAB)

Biologists study organisms and plant life to learn more about their composition, behaviors, habitats, and how they interact with other organisms and their environment. They conduct research, collect samples and measurements, perform tests and experiments, and interpret and report their findings.

> COMPUTATIONAL BIOLOGIST (DRY LAB)

A computational biologist, also called a bioinformatics sci-entist, has both biological knowledge and a computer science background, and uses these to analyze and model data. The field includes many types of biological study, from drug devel-opment to genetics and has expanded along with the biotech and pharmaceutical industries in the past few years. Computational biologists usually work for research institutions or doingresearch for private companies.

> SOFTWARE ENGINEER/COMPUTER SCIENTIST

Computational biologists usually work for research institutions or do research for private companies. Software engineering is an offshoot of computer science involved in designing, developing and producing computer software. Software engineers work with their clients or employers to create customised systems. They can develop everything from operating systems and middleware to network control systems. Their work depends on the business's needs and the desired end results.

In addition to the above roles, your Bioinformatics degree empowers you to enter any industry you choose. Powered by your technical proficiency and computational skills, as well as your analytical line of thinking, you can also apply for non-bioinformatics jobs, such as a Data Analyst, Data Engineer, Consultant, or Engineer (if you are enrolled in the Engineering stream).

COMPANIES TO LOOK OUT FOR

RESEARCH SECTOR

- Children's Cancer Institute
- CSIRO
- Kirby Institute

BIOTECHNOLOGY

- ResMed
- Cochlear
- Medtronic

PHARMACEUTICAL SECTOR

- Novartis
- Pfizer
- Roche

SOFTWARE DEVELOPMENT

- Google
- Atlassian
- Quantium

Tips on the Job Application Process

Resumes and cover letters are the most essential thing to master before you start applying. This is the first impression that you will make on your prospective employer. As a starter for engineering students, the Industrial Training Moodle page covers the basic ground on how to write these. Make sure you complete each module available, to develop a rich understanding on how to optimise your resume and cover letter.

Overall, keep your resume and cover letter short and concise. Resumes should not exceed past 2 pages. Showcase the relevant courses that you have completed and any projects/big assignments that encompass your skills on your resume. If you choose to include references, ensure that you choose two strong references.

When listing your previous work, project or leadership experiences on your resume, you should try and follow the **Three Dot Point** rule.

The first two dot points should describe the tasks that you completed during the experience, highlighting particular skills that you developed or demonstrated. To highlight your abilities, use high modality words that emphasise the impact that you made in your role, such as “Led, Achieved, Designed, Developed, Collaborated” etc.

The third dot point should outline any success metrics or KPIs that you were given in your role, or any significant achievements that you made. This can vary depending on
your responsibilities and the time frame you were there. Two different examples of what this could look like include:

- Collaborated in a team of 4 to present our work to the company managers, and achieved excellency across all professional attributes listed by Engineer's Australia in my supervisor's evaluation; or
- Achieved First place in the Three-minute Thesis pitching competition, delivered a seminar demonstrating the application's functionality to the [Organisation's] managerial team, and increased the efficiency of the product by 75%.

Also, ensure that the formatting of your resume is consistent and clear to read. List your experiences and achievements in chronological order, from the most recent to the least. In the description of any item that you include on your resume, ensure that you utilise the words or key skills that the job application identifies as important for the role.

Tips on the Interview Process

Once you have submitted your application, you may be called in for an interview! Interviews are a great way to allow both parties to get to know each other beyond a piece of paper. They offer candidates the chance to showcase their communication skills, whether it's explaining technical concepts, discussing past projects, or demonstrating how they handle difficult situations.

To help you succeed, here’s some tips to prepare for both the technical and personal aspects of the interview:

- At this level, employers aren’t expecting you to be an amazing programming whiz or a biology genius. Realistically, you’ll be inexperienced as a new intern or grad - recruiters are therefore looking to see if you are rather willing to learn and good to work with. This is why focusing on communication and collaboration is important. Don’t be afraid to mention any society work or casual/part-time jobs, and to showcase how those have developed your soft skills. Interviewers will ask behavioural questions to gain an idea of your soft skills so it’s best to use the STAR (Situation, Task, Action and Result) method to frame your answer.

- Make sure to use your academic experience to your advantage. Talk about internships if you have any, lab work, or research projects where you used bioinformatics tools and methods.

- Make sure to research the company you're interviewing with! Understand the projects they’re involved in and how your skills align with their needs. Whether they focus on health technology, research, or pharmaceuticals, tailoring your responses to their company ethos and work can help set you apart.

- Lastly, you may have to prepare for technical questions. Depending on the company and position you have applied for, be prepared to discuss biology concepts, data structures and algorithms (DSA), or object-oriented programming (OOP) concepts. If you’re sitting a technical interview with live-coding, it may be best to practice DSA and OOP concepts on websites such as Leetcode and Hackerrank.

TIPS AND TRICKS

LinkedIn is a helpful platform for students looking to build their professional network, showcase their skills, and connect with any potential or future employers. As you begin your university studies and career journey, creating a strong LinkedIn profile can help you stand out and get noticed! Below are some tips to help you get started on Linkedin:

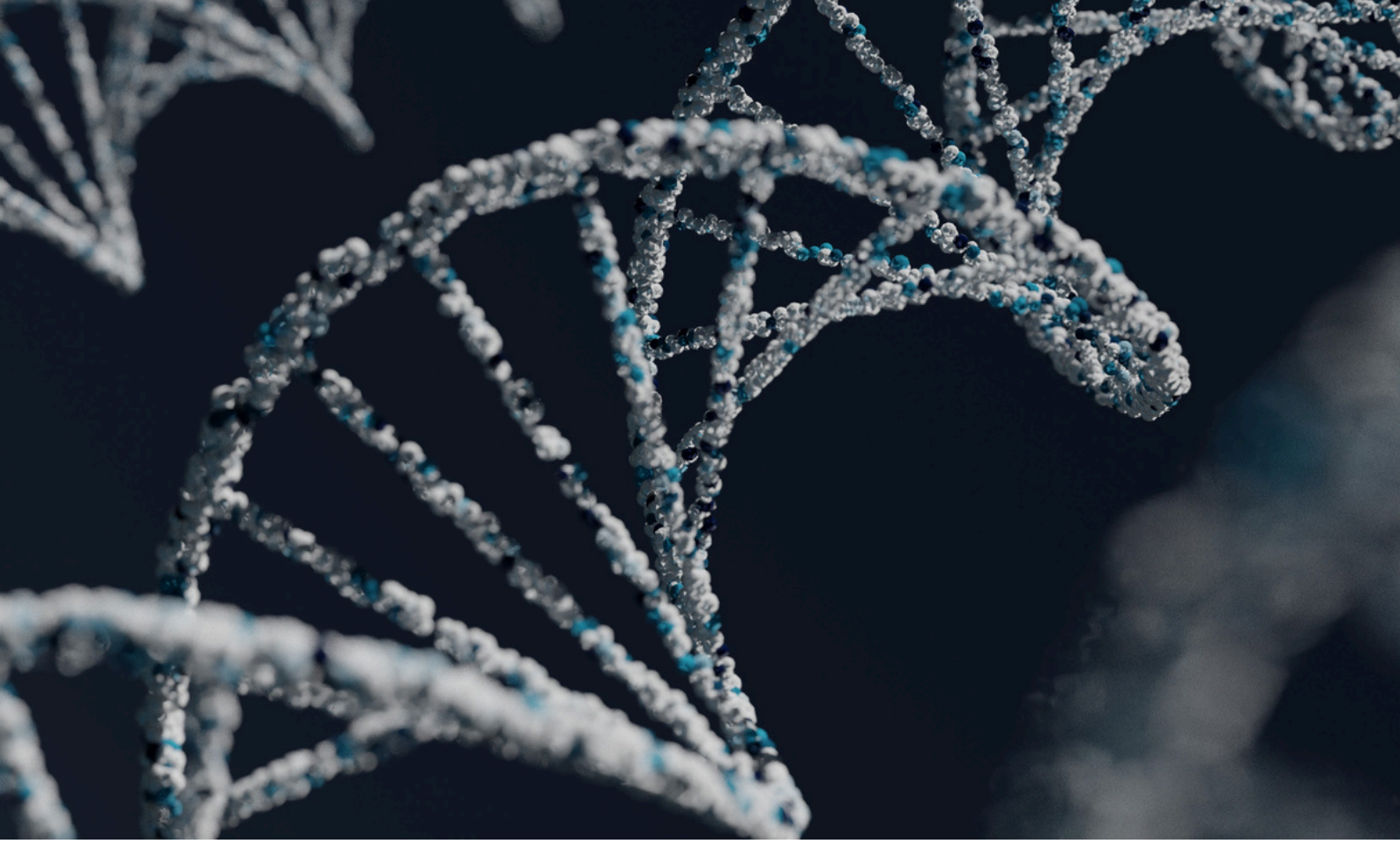
- **Build your network early.** Don't be afraid to add faculty members and fellow students, as this can help create a strong foundation for your professional network. You can also reach out to alumni working in fields you're interested in for advice, mentorship, or networking opportunities. Additionally, following companies, organisations, and professionals in your field will keep you updated on industry trends and job opportunities.

- **Include a snazzy headshot.** Use a professional headshot that presents you in a positive, approachable light, and write a headline that goes beyond just your current status as a student. Make sure to include your degree, areas of interest, or career aspirations. Example: "Bioinformatics Student at UNSW | Aspiring Bioinformatician | Passionate About Research in Genetics."

- **Showcase your projects and achievements**. As a student, you have valuable projects and academic work that demonstrate your skills. Be sure to describe any relevant projects, such as research or group work, and link to any code repositories or presentations that you may have. You may also want to highlight any academic achievements or scholarships you may have attained during your studies.

- **Include your work experience.** Include any internships, part-time jobs, or relevant volunteer work. Even if it's not directly related to your university degree, focus on soft skills like teamwork, communication, and problem-solving.

- **Include your education.** Make sure to include your university, degree/major, expected graduation date, and any relevant coursework or projects.



Template for Resume

Your resume summarises your professional experience, education, skills, and accomplishments. It should be well-structured and concise, with relevant experience prioritised. Ideally, a resume should be one page long, but if you have relevant experience, it may be best to extend to two pages.

[Your Name]

Undergraduate at University of New South Wales
[E-mail | LinkedIn | Mobile]

CAREER PROFILE

I am in [third] year studying the degree Bachelor of Engineering, majoring in Bioinformatics with honours. I am determined to build my career prospects and willing to receive first-hand experience at [company] and its culture. [A sentence summarising your focus at uni and main skills you encompass].

EDUCATION

Bachelor of Engineering (Honours) | 2025 - Present | UNSW

- WAM – XX.X
- Some relevant courses – Data structures and algorithms (C language), Software Engineering Fundamentals (Python), Object-oriented design (Java)...

[Education level] | [Year] | [School name]

- ATAR XX.X

EMPLOYMENT

KCCG Genomics Summer Scholarship, Garvan Institute of Medical Research
2024-now
Overview of what it included and your main involvement:

- Specifics of tasks you completed

[Your position] [Company/employer] 2023-2024

[Your position] [Company/employer] 2022-2023

PROJECTS *(or any other unpaid experience that you have completed that showcase your skills)*

Phylogenomics workflow for short-read sequencing data | 2024 | UNSW [sample]

- Project with Dr [name] bioinformatics lab focusing on evolutionary genomics.
- Creating a Snakemake workflow (using Python scripts) that takes a set of short-read Illumina sequencing data and output supertrees.
- Using tree generating tools like IQ-TREE and ASTRAL and de novo genome assembly using ABySS.

Slackr | April 2024 | UNSW [You can include assignments that are relevant to the role you are applying for]

- Collaborated in a team of 3, performing consistent stand ups and utilised agile techniques to write the backend code of an application with the same functionality as Slack in python3

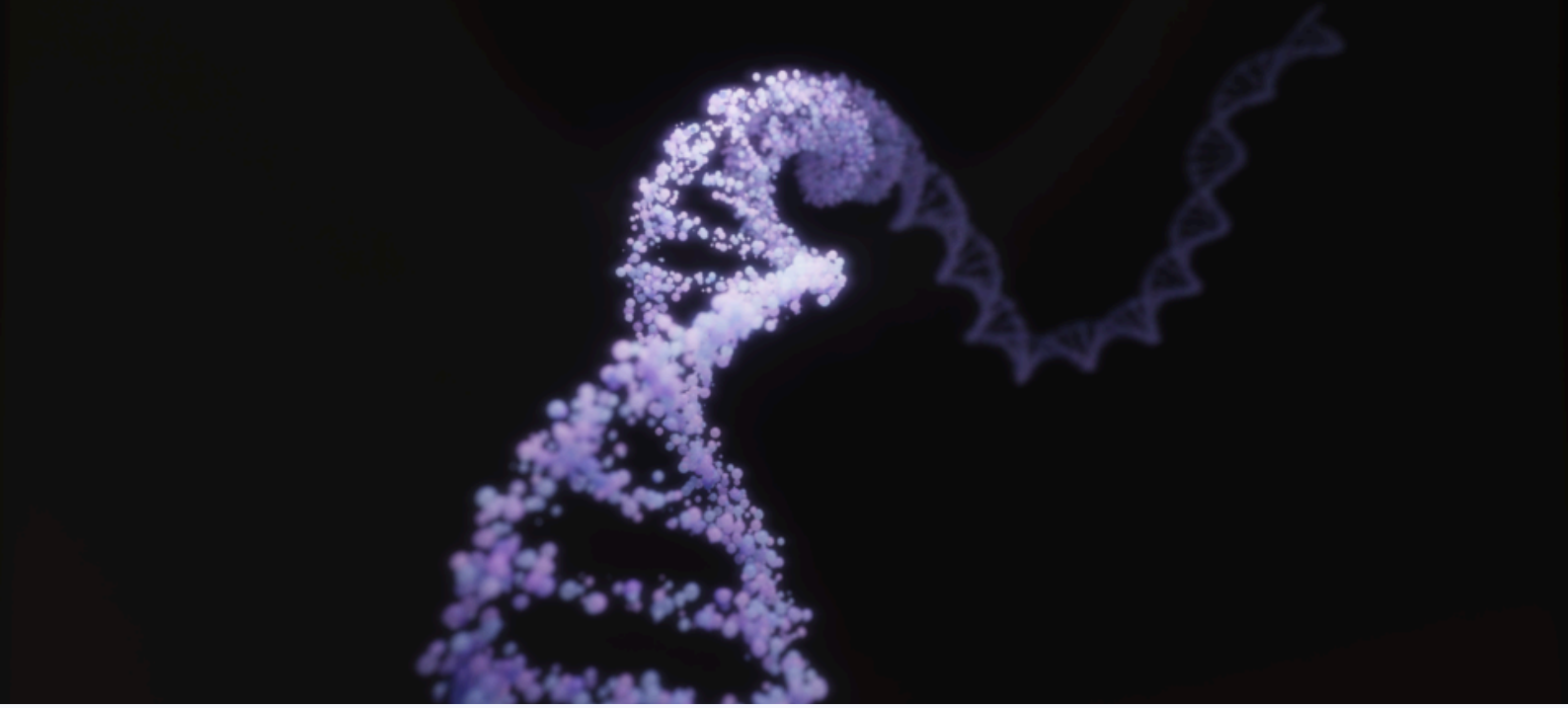
AWARDS AND ACHIEVEMENTS

Dean's Honours List – School of Computer Science and Engineering
2024
[Description of the award]

Pitching Competition - 1st Place
2023
[Description of the award]

KNOWLEDGE & SKILLS

- Experience in modern bioinformatics tools – alignment programs like CLUSTALW, protein structure prediction methods, BLAST programs etc.
- Computational background in programming languages C, Java, Python



Template for Cover Letter

Whilst your resume outlines your professional experience and achievements, your cover letter is the perfect opportunity to demonstrate your personality, passions and values. Showcase that your mission aligns with the organisation that you are applying for, the reasons that are motivating you to apply for the advertised position, and why you are the best candidate. Cover letters should not exceed 1 page, and must be specific to each company and role that you apply for.

[YOUR NAME]

UNSW Sydney

[Phone]

[E-mail]

To [Company/employer],

Re: [position you are applying for]

I write in response to show interest [position you are applying for]. As a competent candidate, I would bring a hardworking attitude and willingness to experience the culture at [company].

Currently, I am a [third] year Computer Science and Engineering student, majoring in Bioinformatics, at UNSW. I seek this professional experience as it aligns with my previous experiences and widens my future career prospects. Majority of my university work has been focused on.... I also have first-hand experience on bioinformatics projects such as....

Previously on my internship/project at..., I was challenged to have an open-mind and.... Following my proactive involvement....

I am willing to explore my options and potentially start my professional career with [company].

Thank you for considering my application.

Yours Sincerely,
[Your name]

Internship Testimonies

“

Getting your first placement can feel challenging, especially without prior work experience in the field. What worked for me was highlighting the skills I learned in university courses, society involvement/volunteering, hackathons, and even relevant workshops. Focus on showing your passion and interest in the area!

I recently completed my internship over the summer at the Garvan Institute of Medical Research. I applied through the Garvan Summer Scholarship Program, which offers a range of projects to choose from. The process involved:

- Submitting my resume.
  - I selected a project from the provided list and answered questions about why I was interested in my chosen project(s).

- An interview with the supervisor of the project I was interested in.
  - I’d say definitely check out BINFsoc’s social media pages for opportunities. We regularly share internship programs and career-related opportunities in bioinformatics.

My daily tasks depended on when I had meetings with my supervisor. Typically, I worked on action items and improvements based on their feedback. I also had the opportunity to attend weekly lab meetings, which were incredibly insightful. These meetings provided updates on the latest research, new discoveries, and results discussions, allowing me to stay engaged with cutting-edge developments!

Lastly, pursue something you're genuinely interested in! This makes the experience more rewarding and keeps you motivated throughout. Passion and enthusiasm really do stand out in applications and interviews!

”

— **Sarina Chai**

BACHELOR OF ENGINEERING (BIOINFORMATICS)
MASTERS OF BIOMEDICAL ENGINEERING

“

I think my best advice to other students is to find professional experience wherever and whenever you can. Even in first year, you can start looking and applying for internships even if it’s just to learn more about the companies.

I'm currently doing an internship in my penultimate year at the sleep health technology company ResMed. What really helped me was mentioning the soft skills and experiences I’ve learned working in retail, and also not being afraid to show my personality and ‘nerd out’ over my uni projects. I would also say try to gain as many experiences as possible (whether that’s society work or retail/hospitality work), as all these experiences will help you with behavioural questions in a job interview.

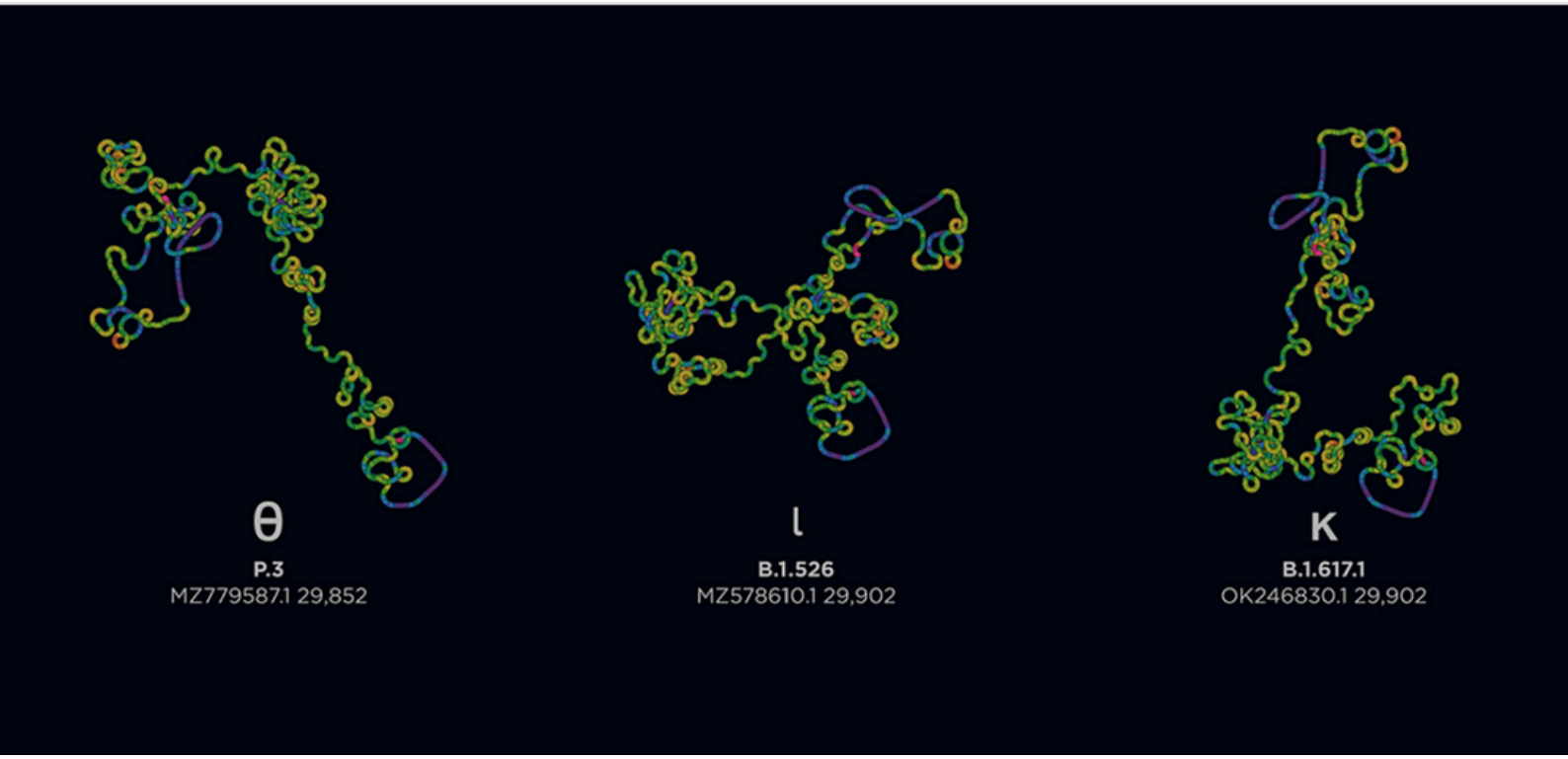
Being an intern at ResMed has been a great and cool experience! I feel like I’ve been fully supported and on top of that, I’ve been given real work to do. It’s really rewarding to know that everything I have learned at uni is helping me contribute to something amazing and bigger than myself. My day-to-day involves developing and using full-stack applications to test the mobile/PC platforms which interact with CPAP devices. The overall experience has been great in that I’ve gained skills and learned new tech stacks I wouldn’t have been able to learn in my uni studies.

Lastly, be prepared to not know what you’re doing and feel out of your depth during an internship or graduate role. Jumping from university studies to real-world work experience can be a big learning curve - just make sure to ask many questions if unsure about something (you’re there to learn!), volunteer yourself for tasks, give yourself some slack and you’ll do well!

”

— **Phoebe Tandjiria**

BACHELOR OF SCIENCE (COMPUTER SCIENCE)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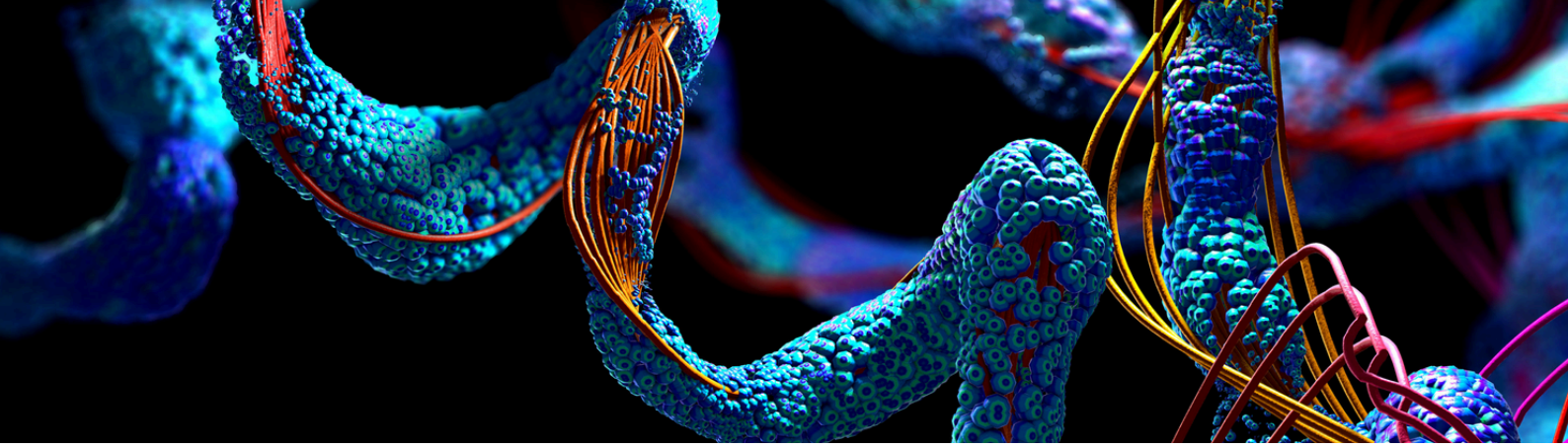

Academia and Further Studies.

Masters

A postgraduate degree offered at UNSW, giving an opportunity to contribute your ideas and knowledge to the world of research. Generally, it is a 2 year degree full-time, (96 UOC), with a written thesis that normally shouldn't exceed 75 000 words. This is then examined by members of the Australian and international scientific academic community.

The minimum requirement for admission to a Masters by Research is:

- an appropriate Bachelor degree with lower second honours or higher OR
- an equivalent qualification from a tertiary institution as determined by the Faculty Higher Degree Committee (HDC).

The minimum requirement for UNSW Scholarship with admission to a Masters by Research is:

- A four-year Bachelor's degree with First Class Honours in a field relevant to the proposed area of research.

PhD (Doctor of Philosophy)

A postgraduate degree offered at UNSW, giving a more specialist experience in Bioinformatics, opening roles to academic, research and professional roles nationally and internationally. This is a longer degree, generally taking 3-4 years full-time. It requires independent and original research, with a written thesis of no more than 100 000 words, examined by members of the Australian and international scientific academic community.

The minimum entry requirement for admission to a PhD includes:

- an appropriate UNSW bachelor degree with upper second-class honours; or a completed Masters by Research from UNSW with a substantial research component and demonstrated capacity for timely completion of a high-quality research thesis;
- or an equivalent qualification from a tertiary institution as determined by the Faculty Higher Degree Committee (HDC).

The minimum requirement for a UNSW scholarship with admission to a PhD include:

- a four-year bachelor degree with honours class from an Australian institution or equivalent research qualification experience -this qualification must be awarded in a field relevant to the proposed area of research.

PhD Student Testimony

Career Insights and Advice

My undergraduate journey began as a Bachelor of Medical Science student at UNSW, majoring in human pathology. Nearing graduation, I was unsure on what I wanted to pursue next, whether it was going into the workforce or continuing higher education. I decided on continuing at university and completing an Honours year at the UNSW Microbiome Research Centre.

This is where I was first exposed to the process of research and data analysis through bioinformatics, something that was completely new to me. I loved the way bioinformatics brought otherwise incomprehensible data to life and helped make sense of the research I was conducting. This interest has followed me through where I am now in my journey: a PhD!

I am in my second year of my PhD at the UNSW Wook Lab and it has already been the most steep learning curve and most incredible time all in one. UNSW offers incredible laboratory resources and networking opportunities and I feel incredibly lucky to have chosen this pathway and university to do my PhD.

My day-to-day lab experience contains primarily wet-lab methods, carrying out protocols in the lab. From there, bioinformatics is truly the key with analysing the results and uncovering what the data really means in a clinical context. My PhD is an amazing blend of wet and dry lab work.

— Hajra Waris

2nd Year PhD Student

More about my PhD, I am researching the association of viral infections during pregnancy and in early childhood with islet autoimmunity, a stage preceding type 1 diabetes. My supervisors are Prof. Maria Craig and Dr Ki Wook Kim, both leading experts in the field of islet autoimmunity, as part of the Environmental Determinants of Islet Autoimmunity (ENDIA) Study.

Research is challenging but it is the drive towards making clinically-relevant discoveries and uncovering why things are the way they are that keep me passionate.


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Industrial Training

To graduate from an accredited engineering program at UNSW, you must complete 60 days of approved industrial training (WIL as a program requirement). Although Industrial Training (IT) is only a requirement in the Engineering stream, it is highly recommended for students majoring in Bioinformatics in the Science stream to also undertake an industry placement. Doing internships and projects in real-world companies is the only way that you will learn what an actual bioinformatician does!

Industrial training must be approved prior to starting the placement and occur during enrolment of your program of study. This is to ensure that the work undertaken is supervised, relevant to your program of study and approved for credit towards industrial training requirements.

<CHECKLIST FOR INDUSTRIAL TRAINING>

// In Moodle, enrol in the UNSW Engineering Industrial Training Moodle course under 'Self-enrolment (Student)' and use enrolment key: Eng5tudent

completed 5 pre-requisite modules {
  a. writing a successful resume and cover letter
  b. interview skills
  c. career planning and networking skills
  d. workplace behaviours
  e. industrial training and your health and safety
}

> choose your school group in moodle so you can submit an approval application for a placement.
> if you have been offered a placement, then you must apply for approval before you commence this placement.
> after applying for approval for your placement, check if you have provided all the required supporting documents.
> make sure you receive the approval prior to commencing your placement.
> complete the employer evaluation form with your supervisor after you started your placement.
> you also need to log your 60 days of placement in the UNSW Engineering Moodle page.
> once you completed your 60 days log, you'll be enrolled into the course ENGG4999 to submit your final written report.
> as soon as you receive a mark of "satisfactory" on your report, you've completed your industrial training.

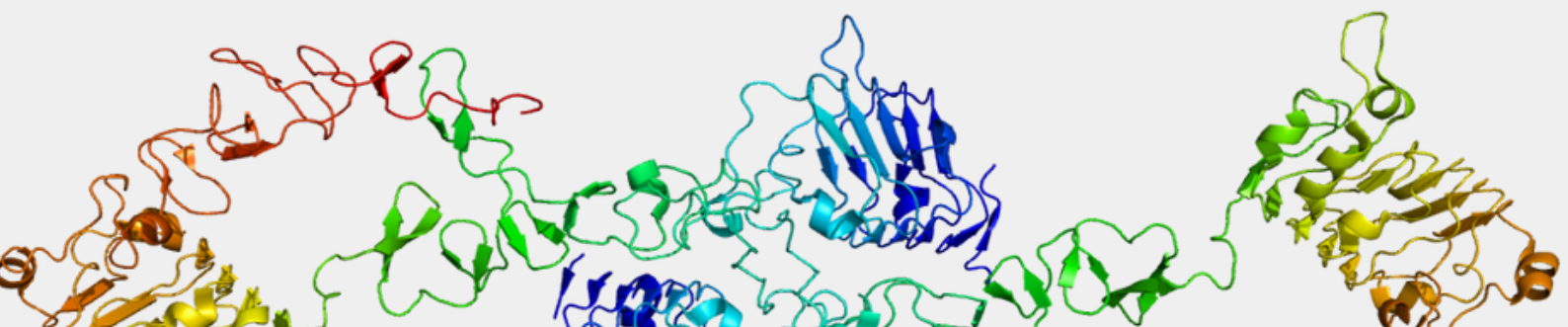
When is the best time to complete your industrial training?

> SINGLE DEGREES

If you're doing the common 4-year Engineering or Science degree in Bioinformatics, the best time to do industrial training would be at the end of Second or Third year. This is because after your first year, you would not have completed many of the computing or bioinformatics courses to have sufficient exposure in the field, especially if you are looking at a Bioinformatics/Research focused company. Additionally, the bioinformatics courses in the degree only start from Second year onward.

The summer period guarantees you the largest chunk of holidays from university and lots of companies will have student intern positions open for the summer. So heaps of opportunities will float your way if you are on the lookout!

You are also allowed to split the 60-day IT period into 2 or 3 parts, and it can be completed at different workplaces. If you plan to complete some courses over summer, then doing a short period of IT can be beneficial for you, if you do not want to overload over holidays.



> DOUBLE DEGREES

If you are doing a double degree that includes Engineering, you have 5 – 6 years of university. Doing a double degree means that you have more opportunities of interning at several companies. You also get the freedom to do multiple internships and extend more than the 60-day period. It is recommended to get into the industry as soon as you can. Potentially, it is possible to do one at the end of every year, from Second through to to Fourth year. This will give you the widest exposure and put you in a very good position if you are interested in completing your Honours project with a company in industry.

Even though you have more time to complete IT, you should ideally have something completed by the end of Third year, even if it covers only part of the 60-day period. It may be smart to leave the summer of your Penultimate year for any last-minute courses that you have missed or need to catch-up on, to avoid extending your graduation any further.

Tips on courses to complete before industrial training

As mentioned, it is optimal to undergo IT after at least completing your Second year. In this way, you will have some relevant courses completed. As a Bioinformatics student, the programming skills that you possess are key for the industry. Most of the positions will require knowledge in at least one programming language. Because of this, it is recommended that you have completed the introduction to programming courses in first year if you don't have prior experience in coding. You should also have some knowledge on the different fields there are in bioinformatics.

```
# include <these courses in your program before industrial training>

{
  a. COMP1511 Introduction to Programming: C language;
  b. COMP1531 Software Engineering fundamentals: Javascript/Typescript
     languages;
  c. COMP2521 Data Structures and Algorithms: C (more advanced);
  d. BINF2010 Introduction to Bioinformatics;
  e. COMP2041 Software Construction: Techniques and Tools (mainly scripting
     languages like Shell and Python which would be useful because many
     modern bioinformatics tools are command-line pipelines);
  f. COMP2511 Object-Oriented Design & Programming: Java language;
}
```

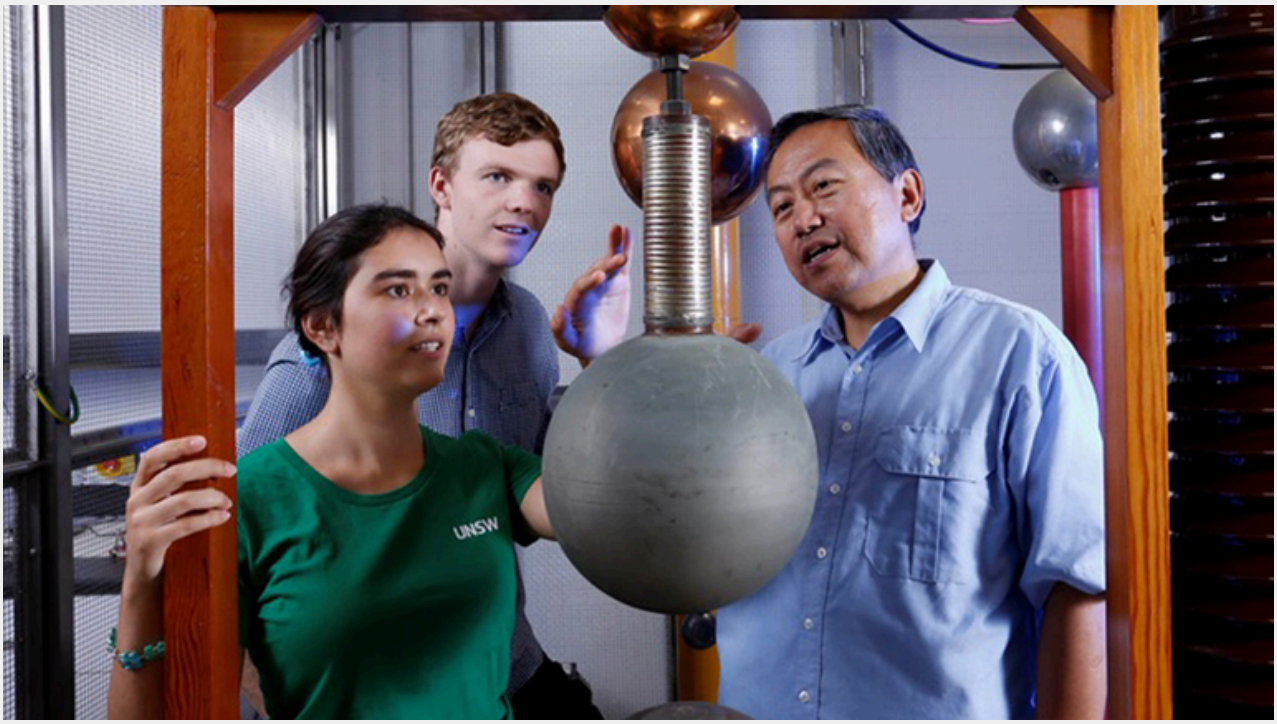
Traditional Industrial Training Opportunities

There are many different ways to find industrial training, both traditional and non-traditional. By joining the Moodle page for Industrial Training (IT for Engineering), you have access to the IT forum, where organiser Michele Hannon constantly posts opportunities available for students. Additionally, the UNSW Employability site outlines various opportunities for internships, and great tips and workshops for finding IT.

Outside of these resources, the best method is to conduct your own independent research into bioinformatics opportunities for students. By finding companies or bioinformatics projects yourself, you also are able to find smaller businesses that may offer internships that are less competitive and less known. For a list of companies that you can look into that offer internships or graduate roles, see Page 54.

If you have found a company or researcher that you are interested in, the best method is to personally reach out and ask if there is an opportunity for an internship or to work with them. There are three main avenues for expressing interest.

The first method is reaching out personally for an opportunity. This is easiest if you have found a researcher or know a person in the company. In this case, reach out via email expressing interest, including both your resume and cover letter in the email (see the above Careers section on Page 61 for a sample cover letter and resume). Ensure this email is written professionally and clearly expresses your motivations and the goals that you want to achieve through working with the organisation.



The second method is to apply through an application portal. This is in the case that the internship has been advertised publicly and is taking formal applications. These applications will traditionally comprise of your resume, cover letter, and answers to a selection of questions. When answering the questions, ensure that you have researched the company and are targeting each answer to show your knowledge of the company and to portray what you want from the experience.

The final method is through cold calling. If you have found a company you are interested in working for, the final way to reach out is by making contact directly. This can be done through calling up the company and asking about internship opportunities for students, or through connecting on a platform such as LinkedIn. LinkedIn is an invaluable tool that you can use to message and connect with professionals that are in a role or project that you would like to be involved with. By sending a personalised LinkedIn connection request, you can ignite discussion and gain advice from your connections and recruiters. You can leverage your network to also find the most relevant contact or email address, that can help secure you a position in your dream organisation.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Non-traditional Industrial Training opportunities

A non-traditional placement can be a student project at UNSW, a program or course where you are exposed to engineering related tasks and technical skills. Examples include ChallENG projects, UNSW WIL Courses, Taste of Research and Project Everest. The best way to find non-traditional opportunities is through the “Careers & Employment Resources’’ section on the UNSW Engineering Moodle page.

If you are completing a placement that is considered Non-Traditional and is not on the list, you can still apply for Non-Traditional pre-approval. The WIL Industrial Training office and your School Industrial Training Academic Coordinator will determine if the placement is suitable.

Work Integrated Learning (WIL)

Work learning experiences integrate into study programs. It enables you to work directly with directly with industries and communities, counting as credits or accreditation towards your degree.

WIL activities vary and might include:

- Approved Placements (internships, clinicals)
- Projects requiring for a partner organisation

To find more about these opportunities at UNSW visit WIL Opportunities at UNSW.

Science Students

The Science faculty offers WIL courses relevant to your specific specialisation/major. Depending on the length of placement or project, enrolling in the specific course can count from 6 up to 12 credits towards your program based on these 3 options:

- Option A: minimum 105-hour placement completed in 1 term (worth 6 UOC)
- Option B: minimum 210-hour placement completed in 1 term (worth 12 UOC)
- Option C: minimum 210-hour placement completed over 2 terms (worth 12 UOC)

Learn more about these opportunities by visiting Science Work Integrated Learning (WIL).

Engineering Students

Students taking any variation of an Engineering program must complete a 60 day Industrial Training (Engineering related WIL) to graduate. This involves enrolling in ENGG4999 (0 credit course), to gain experience within industry by either sourcing your own placement, or working with UNSW collaborated projects.

To find out more about these opportunities visit UNSW Engineering Industrial Training Portal.

ChallENG Program

The university runs a program called ChallENG which connects USNW Engineering students with academics and industries in order to collaborate on mid-to-large real-world projects. There are four branches (pillars) of the ChallENG program. Some pillars offer projects that can count towards course credit in the Bioinformatics Engineering degree, if taken as a discipline elective.

- Note: Other discplines may apply to ChallENG as General Education

One of the pillars is the Vertically Integrated Projects (VIP) program. The VIP program is open to all undergraduate students, meaning that you might be working with students from other engineering disciplines as well as other faculties. This is a great way to learn and gain experience working in a multidisciplinary team.

VIP is worth a total of 6 units of credit, spread across one year. Enrolling in one of the VIP projects on offer requires an online application expressing your interest and any skills you may be able to offer. You may then be contacted by the academic in charge for an interview and accepted before you can formally enroll into one of the courses ENGG2600, ENGG3600, or ENGG4600, depending on your level.

New projects may be added each year, however, projects from previous years will often continue across the next year, allowing new students to enroll and current students to continue in the team for another year if they would like to.

As bioinformatics students, you can submit an application for any project that interests you. If you are unsure which projects are specifically suitable for a bioinformatics student, take a look at Explore Vertically Integrated Projects. A background in computing and software engineering is valuable in a number of projects. From those currently listed at the time of writing, 4D Immersive Surgery, Connected Health, and Connected Health are good places to start.

Project details and program information can be found at Vertically Integrated Projects | The ChallENG Program - UNSW Sydney.

Acknowledgements.

HAFSA FAHAD

PUBLICATIONS/IT EXECUTIVE & TEAM LEAD

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PUBLICATIONS/IT DIRECTOR

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VICE PRESIDENT