

# GENOMICS AND BIOINFORMATICS



KPT/JPT (R/421/6/0027) 10/20 - MQA/SWA0129

Genomics is the study of the total genetic makeup of individual organisms, and bioinformatics encompasses a diverse range of analytical methods and tools applied to genomic data. Genomics is offering new possibilities for therapies and treatments for some complex diseases, as well as new diagnostic methods.

The genomics and bioinformatics major is an interdisciplinary program of study involving the application of theory, laboratory, and information technology relating to the rapidly emerging discipline of genomics and the allied field of bioinformatics. As a result of advances in instrumentation, next generation DNA sequencing has dramatically lowered the cost of generating genomic data sets to the extent that genomics now contributes to a very broad range of biological and medical disciplines. The genomics and bioinformatics major is designed to produce multi-skilled graduates who are equipped to undertake DNA sequencing projects involving different genomic applications with a range of sampling and experimental designs, manage and analyse large and complex data sets using bioinformatic tools, and effectively communicate the results of genomic studies.

Genomics now underpins the study of many exciting and important areas of science that will increasingly contribute to the betterment of society through superior health care (personalised medicine), enhanced food security (better crops), biotechnology breakthroughs (drug and vaccine discoveries and production) and improved conservation and biodiversity management. Graduates with a major in genomics and bioinformatics find employment in medical and agricultural research institutes, hospitals, government departments, schools and universities, patent firms, genetic counselling services, forensics laboratories, and biotechnology and DNA sequencing companies.

## Why study at Monash University?

- Cutting-edge curriculum and excellent teaching led by renowned scientists active in research
- Monash is in the top one per cent of universities worldwide
- Our degree includes opportunities to do an internship and participate in international exchange study programs.

## CAREER OPPORTUNITIES

You will offer an employer excellent technical skills, a capacity for critical thinking, attention to detail, and interest in scientific theory and issues as they relate to society.

- **Research Scientist**
- **Patent Officer**
- **Bioinformatician**
- **Science Writer**
- **Forensic Scientist**
- **Biotechnologist**
- **Software developer**
- **Data Analyst**
- **Bioconservationist**

## FURTHER INFORMATION

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## COURSE STRUCTURE

### YEAR 1

CHM1051	Chemistry 1 advanced
CHM1052	Chemistry 2 advanced
BIO1011	Blueprints for life
BIO1022	Life on Earth
SCI1020	Introduction to statistical reasoning
One level 1 science unit	
Two elective units	

### YEAR 2

GEN2041	Foundations of genetics
GEN2052	Genomics and population genetics
SCI2010	Scientific practice and communication
Two level 2 or 3 science units	
Three elective units	

### YEAR 3

BIN3800	Bioinformatics
BIN3890	Research methods in bioinformatics and big data analysis
GEN3040	Genomics and its applications
GEN3051	Medical and forensic genetics
One level 2 or 3 science unit	
Three elective units	

Disclaimer: Please note that not all degrees, courses, majors and/or units ("Courses") offered at the Malaysia campus are offered at any of the other Monash University campuses. You should always check with the relevant School advisers when planning Courses and making study plans. The inclusion in a publication of details of a Course and the acceptance into a course in no way creates an obligation on the other part of the University to teach it in any given year, or to teach it in a manner described. The University reserves the right to cancel, discontinue or vary Courses at any time without notice. An intercampus exchange or transfer may result in a longer time for degree completion due to variations of Course offering and the semester of the Course offering at each campus. Exchange and transfer arrangements to other Monash University campuses are subject to eligibility criteria, approval and may be subject to quotas. January 2020.

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