BACHELOR OF SCIENCE

KPT/JPT (R2/421/6/0027) 10/25 - MQA/SWA0129

3 years

February, July and October

RM48,960 Malaysian student
RM55,680 International student
2024 fees per year

Internship
(Optional)

CAREER PATHS

Graduates of this course can find employment in areas such as:

- clinical trials
- intellectual property management
- biomedical product industry
- drug discovery and development
- water management
- biodiversity and conservation
- environmental management
- analytical/biomedical chemistry
- biotechnology
- quality assurance and control
- science journalism
- process control
- microbiology
- project management and consultancy
- natural products research
- scientific and regulatory affairs
- climate change advocacy.

Study science at Monash and learn from leading experts whose research is shaping the world's future.

The choice, flexibility and depth across the range of science disciplines available at Monash means that you will graduate with a degree unique to you, tailored to your individual expertise, interests and career aspirations.

We offer specialisations ranging from cutting-edge theoretical and applied science to new interdisciplinary fields. You can choose to focus on a single major, or pursue a double major and still complete your degree within three years. Popular double majors are applied microbiology and biotechnology, and medicinal chemistry and tropical environmental biology, although any combination of the six majors is possible.

Science graduates have diverse and interesting careers. The flexibility of the training and interdisciplinary approach nurtures greater adaptability in our science graduates. Our graduates are scientists, analysts, journalist, environmental advocates, and some are attached to corporate companies as procurement, marketing and corporate personnel. What makes this course special is that it allows you to pursue non-science units at different schools, like journalism or management, to form a study plan that suits your individual needs and career aspirations. You can even supplement a major with a minor.

Get ready for the real world

Build your professional experience with a science-related internship, offered as an elective unit during your summer semester[1]. This is a great way to prepare yourself for the demands of the real world. Leveraging on the industry partnerships across the country and region, we've worked with multinational companies throughout the years to place our students.

Areas of study

- Applied microbiology[2]
- Biotechnology
- Genomics and bioinformatics
- Medicinal chemistry
- Psychology[2]
- Tropical environmental biology[2]
- Chemistry (minor)
- Genetics and genomics (minor).

Course structure

This course is structured in three equal parts:

A. SCIENCE SPECIFIED STUDY

This will expose you to several science disciplines, contributing breadth to your understanding of science and giving you the opportunity to learn more about several disciplines before finalising your choice of major. It'll also provide you with the mathematical or statistical foundation for your study of science and address the nature of science and its communication.

B. SCIENCE LISTED MAJOR

This will provide you with a focused course of study that will develop your expertise in one discipline area. You'll learn to develop, apply and communicate an advanced level of understanding of the concepts and theoretical frameworks that constitute the knowledge base of the discipline.

C. FREE ELECTIVE STUDY

This will enable you to further develop your knowledge of your chosen major, or the sciences more broadly, or study a second science major. Alternatively, you can select units from any school in which you're eligible to enrol.

Your first year

This course provides you with a broad science education in your first year to let you explore your interests before you specialise in one or more areas that inspire you in your second year. This flexibility allows you to explore new areas, further develop your strengths in science, and pursue your interests beyond the area in which you specialise.

During your first year, you're encouraged to choose a range of subjects that can give you a breadth of science knowledge. Areas such as chemistry, biology, and statistics can go hand-in-hand with exciting subjects like earth to microbiology, biotechnology, environmental biology, and psychology. Throughout the course, you can opt to focus entirely on science or pursue complementary interests with the free-elective component of the degree.

YEAR 1/LEVEL 1 UNITS

Two Level 1 science sequences (four units) from:

- Blueprints for life and Life on Earth
- Chemistry 1 advanced and Chemistry 2 advanced
- Foundations in psychology and Introduction to psychological inquiry.

1 Depending on your intake, the summer semester may commence before your third year or in between semesters of your third year.
2 Available as a minor.

YOUR GUIDE TO SCIENCE MAJORS

Within the Bachelor of Science, at least eight units will make up your Science major. You'll also have eight units of free electives, which offer you the flexibility to shape your course in a number of different ways – such as extending your major to add depth, adding a second major or a minor from the same or another course, or studying a range of units from across the University.

APPLIED MICROBIOLOGY

Microorganisms are everywhere in the environment and play a key role in the many countless natural processes. In this course of study, you will explore the structure of microorganisms and their way of life, their interactions with humans and other living organisms, and their role and interactions with the environment – both in beneficial and harmful ways.

You will learn how beneficial microorganisms are harnessed to develop products, processes, or as solutions in various industries like medicine, agriculture, biomedical science, biotechnology, ecology, environmental management, food fermentation, food safety, and pharmaceutical. For harmful microorganisms, you will have a better understanding of control measures in addressing emerging health challenges, such as influenza outbreaks, SARS, Ebola, and the increasing antibiotic resistance in medically important bacteria.

At the core of this major is the focus on microorganisms and their interactions on how microbes can drive groundbreaking advancements in various industries.

YEAR 2/LEVEL 2 UNITS

- Fundamentals of microbiology
- Recombinant DNA technology
- Scientific practice and communication
- One level 2 or 3 science unit
- Four elective units.

YEAR 3/LEVEL 3 UNITS

- Environmental microbiology
- Food and industrial microbiology
- Two units from:
  - Medical microbiology
  - Molecular biology and biotechnology
  - Science in action research project
- Two level 2 or 3 science units
- One elective unit.

CAREER OPTIONS

- Clinical, veterinary, food, industrial or environmental microbiologist
- Patent officer
- Research scientist
- Technical brewer
- Quality controller.

BIOTECHNOLOGY

Biotechnology is the study of using living organisms and biological systems to develop technological applications and solutions. It allows you to explore advancements in science and technology to manage global challenges, develop innovative solutions and improve the quality of life for people worldwide.

This program builds a solid foundation in the basic sciences focussing on essential laboratory skills such as instrumentation, experimental design and data analysis, biochemical and microbiological techniques, and recombinant DNA technology.

You will learn genetics, genomics, plant biotechnology, environmental biotechnology, ethics and regulation, which are crucial for the rapidly growing biotech industries worldwide. You will also develop scientific communication skills with practical classes that offer hands-on experience to enhance your laboratory skills.

This major offers a fulfilling pathway for those passionate about pushing the boundaries of scientific knowledge and making a positive impact on society.

YEAR 2/LEVEL 2 UNITS

- Foundations of genetics
- Recombinant DNA technology
- Scientific practice and communication
- One level 2 or 3 science unit
- Four elective units.

YEAR 3/LEVEL 3 UNITS

- Laboratory and workplace management
- Medical and forensic genetics
- Two units from:
  - Plant biotechnology
  - Genomics and its applications
  - Molecular biology and biotechnology
  - Science in action research project
- Two level 2 or 3 science units
- Two elective units.

CAREER OPTIONS

- Biotechnology product developer
- Geneticist
- Hospital or medical laboratory technician
- Instrument specialist
- Intellectual property officer
- Pharmaceutical and product manufacturer
- Policy office
- Process control specialist.

GENOMICS AND BIOINFORMATICS

Genomics is a comprehensive study of the total genetic makeup of individual organisms, exploring their genetic structure, functions, and evolutionary history. It also integrates the study of genetics with computing technology that helps in building better comprehension of biological organisms and their processes. Meanwhile, bioinformatics employs an array of analytical methods and tools to effectively analyse, interpret, and gain insights from genomic data.

Genomics and bioinformatics is therefore instrumental in improving conservation and biodiversity, enhancing crops and food security, driving a revolutionary shift in healthcare and personalised medicine, and enabling biotechnology breakthrough which leads to drug and vaccine discoveries.

YEAR 2/LEVEL 2 UNITS

- Foundations of genetics
- Genomics and population genetics
- Scientific practice and communication
- Two level 2 or 3 science units
- Three elective units.

YEAR 3/LEVEL 3 UNITS

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

CAREER OPTIONS

- Research scientist
- Science writer
- Software developer
- Patent officer
- Forensic scientist
- Data analyst
- Bioinformatician
- Biotechnologist
- Bioconservationist.

MEDICINAL CHEMISTRY

Medicinal chemistry is an exciting field with rapid progress that involves designing, developing, and researching the biological activities and properties of drugs. The field is driven by the desire to discover potent chemical compounds, primarily from a diverse array of natural products found in plants and microorganisms.

This major provides comprehensive learning in organic chemistry, synthetic chemistry, analytical chemistry, and pharmaceutical science. The curriculum focuses on the design and development of bio-active molecules and chemical synthesis of compounds, to facilitate the discovery and development of new drugs and therapeutic agents for clinical use.

The emphasis of this major is on the significance of understanding chemical structures and their interactions in biological systems. You will acquire hands-on experience with the latest research advances and the use of instrumentation. Applications in medicinal chemistry align with Malaysia's National Key Economic area in health care, which includes three sectors: pharmaceuticals and biotechnology, medical technology, and health services.

YEAR 2/LEVEL 2 UNITS

- Inorganic and organic chemistry
- Spectroscopy and analytical chemistry
- Physiology of human body systems or Physiology of human health
- Scientific practice and communication
- One level 2 or 3 science unit
- Three elective units.

YEAR 3/LEVEL 3 UNITS

- Medicinal chemistry
- Advanced organic chemistry
- Principles of pharmacology
- One level 2 or 3 science unit
- One level 3 science unit
- Three elective units.

CAREER OPTIONS

- Analytical or biomedical chemist
- Biotechnologist
- Drug development chemist
- Industrial chemist
- Molecular design chemist
- Occupational hygienist
- Pharmaceutical and product manufacturer
- Risk-management consultant.

TROPICAL ENVIRONMENTAL BIOLOGY

Tropical environments are the most ecologically diverse environments on our planet. They include rainforests, mangroves, wetlands, peat swamps, freshwater and marine environments, among others. This program takes on an effective and environmentally friendly approach to promote conservation and sustainability, in efforts to mitigate environmental degradation and climate change.

Combining expertise in biodiversity, water quality management, wetland conservation, climate change mitigation, evolutionary ecology, and microbial ecology, Monash University Malaysia offers a unique advantage for studying tropical environmental biology.

This major offers specialised training in tropical environmental biology and focuses particularly on techniques and field skills essential for the study of environment, ecosystems and biodiversity. You will explore a diverse range of topics, including environmental science, tropical ecology, terrestrial and aquatic tropical biology, tropical environmental management, and the conservation of bioresources.

Through engaging field trips, informative lectures, and hands-on research projects, you will develop an appreciation for tropical environments. You will also gain a comprehensive understanding of various tropical ecosystems in the region. Your keen understanding and appreciation for the environment would help in making a change to better the environment for all life on earth.

YEAR 2/LEVEL 2 UNITS

- Introduction to ecological applications
- Global conservation and biodiversity
- Data analysis for science
- Scientific practice and communication
- One level 2 or 3 Science unit
- Three elective units.

YEAR 3/LEVEL 3 UNITS

- Tropical environmental management
- Tropical terrestrial biology
- Tropical aquatic biology
- One level 2 or 3 science unit
- One level 3 science unit
- Three elective units.

CAREER OPTIONS

- Environmental scientist
- Ecotourism operator
- Policy advisor
- Land use planner
- Marine biologist
- Museum scientist
- Natural resource manager
- Waste and resources consultant
- Water quality consultant.

PSYCHOLOGY

Psychology is the study of mind and behaviour. It is a broad scientific discipline that includes investigations of the brain, learning, memory, perception, reasoning, decision making, language, developmental and social processes, personality, and mental health and well-being. It is also concerned with the practical and ethical applications of psychological research to the profession.

YEAR 2/LEVEL 2 UNITS[1]

- Scientific practice and communication
- Five elective units (if you're choosing two Psychology/PSY units) or four elective units (if you're choosing three Psychology/PSY units)

Two or three units from:

- Biological psychology
- Psychological testing and assessment
- Developmental psychology
- Personality and social psychology.

YEAR 3/LEVEL 3 UNITS[1]

- Five elective units (if you're choosing three psychology/PSY units) or four elective units (if you're choosing four psychology/PSY units)

Three or four units from:

- Perception and cognitive psychology
- Psychological disorders
- Research methods and theory
- Cultural safety, responsiveness and reflexivity in practice.

1 Select two Level 2 units plus four Level 3 units, or three Level 2 units plus three Level 3 units.

Minors

CHEMISTRY

Chemistry is the study of the makeup and structure of substances, how their atoms and molecules react and interact, and how that behaviour can be harnessed to transform materials, medicine, and technology. It is considered a core science and the foundation for more specialised disciplines.

GENETICS AND GENOMICS

Genetics is the study of genes, their structure, function, transmission and evolution. Genomics allows researchers to expand their vision from a few genes to all of the thousands of genes that govern the lives of each organism. Together, they underpin many exciting areas such as conservation biology and forensics.

These areas are also available as minors:

- Applied microbiology
- Psychology
- Tropical environmental biology.

SAMPLE COURSE MAP[1] (FEBRUARY INTAKE)

What your course will look like if you majored in applied microbiology.

YEAR 1/LEVEL 1	UNITS			
Semester 1 24 Credit points	**BIO1011** Blueprints for life 6 Credit points	**CHM1051** Chemistry 1 advanced 6 Credit points	**SCI1020** Introduction to statistical reasoning 6 Credit points	Elective 6 Credit points
Semester 2 24 Credit points	**BIO1022** Life on Earth 6 Credit points	**CHM1052** Chemistry 2 advanced	Level 1 Science unit 6 Credit points	Elective 6 Credit points
YEAR 2/LEVEL 2	**UNITS**			
Semester 1 24 Credit points	**BTH2830** Fundamentals of microbiology 6 Credit points	**SCI2010** Scientific practice and communication 6 Credit points	Elective 6 Credit points	Elective 6 Credit points
Semester 2 24 Credit points	**BTH2732** Recombinant DNA technology 6 Credit points	Level 2 or 3 Science unit 6 Credit points	Elective 6 Credit points	Elective 6 Credit points
Summer semester[2] 6 credit points	**SCI1800** Introduction to environmental sustainability, or **SCI3800** Science internship (Recommended elective).			
YEAR 3/LEVEL 3	**UNITS**			
Semester 1 24 Credit points	**BTH3732** Environmental microbiology 6 Credit points	**FST3711** Food and industrial microbiology 6 Credit points	Level 2 or 3 Science unit 6 Credit points	Elective 6 Credit points
Semester 2 18 Credit points	Two units from: • **BTH3722** Medical microbiology • **BTH3752** Molecular biology and biotechnology • **SCI3990** Science in action research project 12 Credit points total		Level 2 or 3 Science unit 6 Credit points	

Science specified study Science listed major Free elective study

1 This course map is intended as a rough guide. Units listed may vary depending on intake, availability and the latest requirements.
2 Depending on your intake, the summer semester may commence before your third year or in between semesters of your third year.

Scan to view all science major course maps.

Follow our students into the rainforest as they take a close-up look at the biology of terrestrial tropical ecosystems in Southeast Asia.

SCAN TO WATCH