Undergraduate domestic course

Bachelor of Science (Earth Science)

Year	2022
QUT code	ST01
QTAC code	418011
CRICOS	077696D
Duration	3 years full time 6 years part time
ATAR/Selection rank	70.00
Total credit points	288
Start months	July, February
Domestic fee (indicative)	2022: CSP $8,000 per year full-time (96 credit points)
Course contact	askqut@qut.edu.au 3138 2000

This PDF contains information about the course structure. For more information about the course see the course information PDF

Course structure

During your first year of study you'll get to sample a range of core science disciplines, allowing you to decide on your major later.

Faculty core units

These five units give you an introduction to the principles of science. The inquiry based experimental science units will give you the opportunity to learn by enquiry and become familiar with the methods of scientific inquiry.

From your very first semester, you will collaborate with your peers and teaching staff in QUT's exciting new learning environments. You will explore real-world problems from multiple scientific perspectives and learn the tools of the trade. Depending on your choices, you may find yourself out in the field, working in the laboratory or learning about the impact of scientific discovery on people, policy, industry and the planet.

Working with data you have collected, you'll study how to apply fundamental methods of scientific practice, perform scientific analysis, and learn the tools to present your findings. You'll have the opportunity to explore and discover the range of career and professional outcomes available to you, so you can gain the most from your unit selection and the flexibility the Bachelor of Science has to offer.

Your major

Your major is your main area of study for what you aspire to become professionally. You will receive in-depth knowledge and expertise within your chosen scientific discipline, preparing you for entry into the workforce or further study. Your primary major comprises 11 units.

Complementary study areas

This is where you make the degree your own, tailoring your studies to further match your individual career goals with a wide range of complementary study options available. You'll have the opportunity to develop sought-after professional skills, deepen your understanding of your major discipline, pursue an interest from across the university, or broaden your scientific understanding. You can even work with industry or study overseas to gain credit towards your degree.

You can choose: a second major (eight units); or a minor.

Second major (eight units)
Choose a second area of study to complement your major, and develop a significant depth of knowledge and skills in two discipline areas. Experience another field, learn another academic methodology and experience interdisciplinary networking.

Choose a second science discipline (biological sciences, chemistry, environmental science or physics), or explore different perspectives which might include:

- computational and simulation science
- innovation and entrepreneurship
- science communication, or
- policy and governance.

Minor (four units)
You might prefer to expand the breadth and depth of your studies by adding to your chosen science major with two minors.

Structures

- Earth Science Full-time Course Structure: February Entry
- Earth Science Full-time Course Structure: Mid-year Entry

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Unit Lists

- Science: Core Unit Options
- ***** SECOND MAJORS - Important Enrolment Information [PLEASE READ] *****
- Biological Sciences
- Chemistry
- Computational and Simulation Science
- Environmental Science
- Human Biomolecular Sciences
- Innovation and Entrepreneurship
- Physics
- Sustainable Environments for Health
- Policy and Governance
- **** MINORS - Important Enrolment Information [PLEASE READ] ****
- Astrophysics
- Biological Sciences
- Biotechnology and Genetics
- Chemistry
- Computational and Simulation Science
- Environmental Science
- Forensic Science
- Geology Extension
- Human Health and Disease
- Industrial Chemistry
- Innovation
- Medicinal Chemistry and Biology
- Physics
- Science and Mathematics Education
- Sustainable Environments for Health
- Wildlife Ecology

Earth Science Full-time Course Structure: February Entry

Semesters

- Year 1, Semester 1
- Year 1, Semester 2
- Year 2, Semester 1
- Year 2, Semester 2
- Year 3, Semester 1
- Year 3, Semester 2
- Earth Science Major Unit Options

Code	Title
Year 1, Semester 1	
SEB104	Grand Challenges in Science
SEB113	Quantitative Methods in Science
SEB115	Experimental Science 1
SEB116	Experimental Science 2
Year 1, Semester 2	
ERB101	Earth Systems
ERB102	Evolving Earth
Core Unit Option	
Earth Science Major Unit Option	
Year 2, Semester 1	
ERB201	Destructive Earth: Natural Hazards
ERB202	Marine Geoscience
2nd major or minor unit	
2nd major or minor unit	
Year 2, Semester 2	
ERB203	Sedimentary Geology and Stratigraphy
ERB204	Deforming Earth: Fundamentals of Structural Geology
2nd major or minor unit	
2nd major or minor unit	
Year 3, Semester 1	
ERB301	Chemical Earth
ERB302	Applied Geophysics
2nd major or minor unit	
2nd major or minor unit	
Year 3, Semester 2	
ERB303	Energy Resources and Basin Analysis
ERB304	Dynamic Earth: Plate Tectonics
2nd major or minor unit	
2nd major or minor unit	
Earth Science Major Unit Options	
BVB101	Foundations of Biology
BVB102	Evolution
CVB101	General Chemistry
CVB102	Chemical Structure and Reactivity
EVB102	Ecosystems and the Environment
MXB100	Introductory Calculus and Algebra
PVB101	Physics of the Very Large
PVB102	Physics of the Very Small

Earth Science Full-time Course Structure: Mid-year Entry

Semesters

- Year 1, Semester 2
- Year 2, Semester 1
- Year 2, Semester 2
- Year 3, Semester 1
- Year 3, Semester 2
- Year 4, Semester 1
- Earth Science Major Unit Options

Code	Title
Year 1, Semester 2	
ERB101	Earth Systems
ERB102	Evolving Earth
SEB104	Grand Challenges in Science
SEB113	Quantitative Methods in Science
Year 2, Semester 1	
ERB201	Destructive Earth: Natural Hazards
ERB202	Marine Geoscience
SEB115	Experimental Science 1
SEB116	Experimental Science 2
Year 2, Semester 2	
ERB203	Sedimentary Geology and Stratigraphy
ERB204	Deforming Earth: Fundamentals of Structural Geology
2nd major or minor unit	
2nd major or minor unit	
Year 3, Semester 1	
ERB301	Chemical Earth

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Code	Title
ERB302	Applied Geophysics
Core Unit Option	
Earth Science Major Unit Option	
Year 3, Semester 2	
ERB303	Energy Resources and Basin Analysis
ERB304	Dynamic Earth: Plate Tectonics
2nd major or minor unit	
2nd major or minor unit	
Year 4, Semester 1	
2nd major or minor unit	
2nd major or minor unit	
2nd major or minor unit	
2nd major or minor unit	
Earth Science Major Unit Options	
BVB101	Foundations of Biology
BVB102	Evolution
CVB101	General Chemistry
CVB102	Chemical Structure and Reactivity
EVB102	Ecosystems and the Environment
MXB100	Introductory Calculus and Algebra
PVB101	Physics of the Very Large
PVB102	Physics of the Very Small

Science: Core Unit Options

Unit List	
Code	Title
BVB101	Foundations of Biology
BVB102	Evolution
CAB201	Programming Principles
CVB101	General Chemistry
CVB102	Chemical Structure and Reactivity
CWB111	Scientific and Technical Writing
ERB101	Earth Systems
ERB102	Evolving Earth
EUB251	Environment and Society
EVB102	Ecosystems and the Environment
IFB102	Introduction to Computer Systems
IFB104	Building IT Systems
KKB190	Yatdjuligin - Cultural Safety in Indigenous Australian Context
KKB193	Indigenous Knowledge: Research Ethics and Protocols
MXB100	Introductory Calculus and Algebra
MXB161	Computational Explorations
MZB101	Modelling with Introductory Calculus
MZB125	Introductory Engineering Mathematics
(MZB125 recommended for Physics major)	
PQB360	Global Energy Balance and Climate Change
PVB101	Physics of the Very Large
PVB102	Physics of the Very Small
SEB701	Work Integrated Learning 1

Unit List
OR any unit subject to approval from course coordinator.
PLEASE NOTE:
The following unit options have been discontinued, but will still count:
CRB111 Environment Hazards (disc 30/06/2019)
Students must not select a unit which will be core to their major (eg. Students undertaking the Biological Sciences major must not select BVB101 or BVB102 as a core unit option).

***** SECOND MAJORS - Important Enrolment Information [PLEASE READ] *****

INSTRUCTIONS FOR SECOND MAJORS	
Code	Title
* You must complete 96 credit points (normally eight 12 credit point subjects) from the specified units to achieve a second major.	
* Any unit(s) that is mandatory in your primary major, can NOT be selected in your chosen second major.	
* Any unit(s) that appear in multiple second majors can only contribute towards the completion of one of these second majors.	

Biological Sciences

Unit List	
Code	Title
ST01SMJ-BIOLOGY	
Select 8 units (96cp) from the option list:	
BVB101	Foundations of Biology
BVB102	Evolution
BVB201	Biological Processes
BVB202	Experimental Design and Quantitative Methods
BVB203	Plant Biology
BVB204	Ecology
BVB214	Vertebrate Life
BVB301	Animal Biology
BVB305	Microbiology and the Environment
BVB313	Population Genetics and Molecular Ecology
The following unit options have been discontinued, but will still count towards this minor:	
BVB302 Applied Biology (disc 30/06/2018)	

Chemistry

Unit List	
Code	Title
ST01SMJ-CHEMIST	
Select 8 units (96cp) from the option list:	
CVB101	General Chemistry
CVB102	Chemical Structure and Reactivity
CVB201	Inorganic Chemistry
CVB202	Analytical Chemistry
CVB203	Physical Chemistry
CVB204	Organic Structure and Mechanisms
CVB301	Organic Chemistry: Strategies for Synthesis

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Unit List	
CVB302	Applied Physical Chemistry
CVB303	Coordination Chemistry

Computational and Simulation Science

Unit List	
Code	Title
MSSTSMJ-COMPSIM ver 2	
MXB103	Introductory Computational Mathematics
MXB100	Introductory Calculus and Algebra
OR	
IFB104	Building IT Systems
MXB161	Computational Explorations
MXB261	Modelling and Simulation Science
MXB262	Visualising Data
MXB361	Aspects of Computational Science
MXB362	Advanced Visualisation and Data Science
CAB201	Programming Principles

Environmental Science

Unit List	
Code	Title
ST01SMJ-ENVIRSC	
Select eight units (96cp) from the option list:	
BVB202	Experimental Design and Quantitative Methods
BVB204	Ecology
BVB214	Vertebrate Life
BVB311	Conservation Biology
ERB101	Earth Systems
ERB201	Destructive Earth: Natural Hazards
ERB310	Groundwater Systems
EVB102	Ecosystems and the Environment
EVB203	Geospatial Information Science
EVB221	Remote Sensing of the Environment
EVB302	Environmental Pollution
EVB312	Soils and the Environment
The following unit options have been discontinued, but will still count towards this 2nd major:	
ENB380 Environmental Law and Assessement (disc 30/06/2017). [Replaced by ERB310 in 2017.]	
EVB201 Global Environmental Issues (disc 31/12/2017). [Replaced by BVB311 in 2018.]	
EVB212 Soils and the Environment (disc 30/06/2017). [Replaced by EVB312 in 2017.]	
EVB301 Urban and Natural Environmental Systems (disc 31/12/2016). [Replaced by BVB204 in 2017]	

Human Biomolecular Sciences

Unit List	
Code	Title
ST01SMJ-HUMBIO	
LQB180	Foundations of Biochemistry
LQB182	Cell and Molecular Biology
LSB111	Understanding Disease Concepts
LQB185	Anatomy and Physiology for Health Professionals
PLUS select TWO of the following discipline progression options to complete the minor:	
Anatomy Extension (ST01EXT-ANATOM)	
LQB382	Developmental Anatomy and Tissue Adaptation
LQB482	Anatomical Imaging
Biochemistry Extension (ST01EXT-BIOCHM)	
LQB381	Biochemistry
LQB681	Biomolecular Research Skills
Microbiology Extension (ST01EXT-MICRBIO)	
LQB362	Principles and Practice of Infectious Diseases
LQB494	Pathogen Biology and Pathogenesis
Molecular Cell Biology Extension (ST01EXT-MOLCEL)	
LQB385	Molecular Biology and Bioinformatics
LQB485	Cell Biology
Physiology Extension (ST01EXT-PHYSIO)	
LQB388	Medical Physiology 1
LQB488	Medical Physiology 2

Innovation and Entrepreneurship

Unit List	
Code	Title
ST01SMJ-INNOVAT	
BSB115	Management
MGB200	Managing People
MGB225	Intercultural Communication and Negotiation Skills
MGB226	Innovation, Knowledge and Creativity
MGB227	Entrepreneurship
MGB310	Managing Sustainable Change
MGB324	Managing Business Growth
MGB341	Managing Risk

Physics

Unit List	
Code	Title
ST01SMJ-PHYSICS	
Select Eight units (96 credit points) from the option list:	
PVB101	Physics of the Very Large
PVB102	Physics of the Very Small
PVB200	Computational and Mathematical Physics
PVB202	Mathematical Methods in Physics
PVB203	Experimental Physics
PVB204	Electromagnetism
PVB301	Materials and Thermal Physics
PVB302	Classical and Quantum Physics
PVB303	Nuclear and Particle Physics

Sustainable Environments for Health

Unit List	
Code	Title
ST01SMJ-PUBHLTH	

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Unit List	
LSB111	Understanding Disease Concepts
PUB209	Health, Culture and Society
PUB215	Public Health Practice
PUB332	Sustainable Environments for Health
PUB326	Introduction to Epidemiology
PUB406	Health Promotion Practice
PUB461	Qualitative Inquiry in Public Health
PUB545	Health Policy, Planning and Advocacy

Policy and Governance

Unit List	
Code	Title
JSBXSMJ-POLGOV	
JSB171	Justice and Society
JSB178	Policy, Governance and Justice
JSB261	Theories of Government
JSB263	Global Political Institutions
JSB266	White Collar Crime and Official Corruption
JSB273	Justice Research Methods
JSB379	Political Practice, People Power, and Protest
JSB380	Critical Policy Analysis

Astrophysics

Unit List	
Code	Title
ST01MNR-ASTPHYS	
PVB210	Stellar Astrophysics
PVB220	Cosmology
Select two units (24 credit points) from the elective list:	
MXB103	Introductory Computational Mathematics
MXB161	Computational Explorations
PCB593	Digital Image Processing
PVB101	Physics of the Very Large

Biological Sciences

Unit List	
Code	Title
ST01MNR-BIOLOGY	
Choose four units (48 credit points) from the option list:	
BVB101	Foundations of Biology
BVB102	Evolution
BVB201	Biological Processes
BVB202	Experimental Design and Quantitative Methods
BVB203	Plant Biology
BVB204	Ecology
BVB301	Animal Biology
BVB305	Microbiology and the Environment
BVB313	Population Genetics and Molecular Ecology

Biotechnology and Genetics

Unit List	
Code	Title
ST01MNR-BIOGTEN	
BVB317	Principles of Genomics and Biotechnology
BVB328	Applications in Biotechnology
BVB330	Synthetic Genomics
Select ONE unit from the following options (Select BVB101 as prerequisite if required)	
BVB101	Foundations of Biology
CVB225	Forensic Biology and Analytical Toxicology
The following unit options have been discontinued, but will still count towards this minor:	
LQB411 BioInnovation Skills (disc 31/12/2019)	

Chemistry

Unit List	
Code	Title
ST01MNR-CHEMIST	
Choose four units (48 credit points) from the Unit Option list:	
CVB101	General Chemistry
CVB102	Chemical Structure and Reactivity
CVB201	Inorganic Chemistry
CVB202	Analytical Chemistry
CVB203	Physical Chemistry
CVB204	Organic Structure and Mechanisms

Computational and Simulation Science

Unit List	
Code	Title
MSBXMNR-COMPSSC	
MXB261	Modelling and Simulation Science
MXB262	Visualising Data
PLUS	Select two units (24 credit points) from the selective list:
MXB161	Computational Explorations
MXB361	Aspects of Computational Science
MXB362	Advanced Visualisation and Data Science
NOTE: From 2019, MXB161 has been moved to the option list.	

Environmental Science

Unit List	
Code	Title
ST01MNR-ENVIRSC	
Choose four units (48 credit points) from the Unit Option list:	
BVB202	Experimental Design and Quantitative Methods
BVB204	Ecology
BVB311	Conservation Biology
ERB101	Earth Systems
ERB310	Groundwater Systems
EVB102	Ecosystems and the Environment
EVB203	Geospatial Information Science
EVB302	Environmental Pollution
EVB312	Soils and the Environment

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Forensic Science

Unit List	
Code	Title
STBXMNR-FORENSC	
Core Units:	
CVB215	Criminalistics and Physical Evidence
CVB216	Forensic Chemistry
Plus any two units (24 credit points) from the following:	
CVB217	Digital Forensics
CVB225	Forensic Biology and Analytical Toxicology
JSB174	Forensic Psychology and the Law

Geology Extension

Unit List	
Code	Title
ST01MNR-GEOLOG	
Select 48 credit points from the following	
ERB205	Earth Materials
ERB206	Petrology
ERB305	Geological Field Methods
ERB306	Earth's Mineral Resources

Human Health and Disease

Unit List	
Code	Title
ST01MNR-HUMHLH	
LQB362	Principles and Practice of Infectious Diseases
LSB111	Understanding Disease Concepts
LSB142	Human Anatomy and Physiology
LQB450	Foundations of Pharmacology
[LSB384 is replaced by LQB450 from 2018]	

Industrial Chemistry

Unit List	
Code	Title
ST01MNR-INDCHEM	
CVB211	Industrial Chemistry
CVB221	Unit Operations
EGB262	Process Principles
SELECT 1 OPTION FROM:	
BSB115	Management
CVB212	Industrial Analytical Chemistry
EGB361	Minerals and Minerals Processing
The following unit options have been discontinued, but will still count towards this minor:	
EGB363 Safety and Environmental Management (disc 31/12/2018)	

Innovation

Unit List	
Code	Title
ST01MNR-INNOVAT	
BSB115	Management
MGB226	Innovation, Knowledge and Creativity
MGB227	Entrepreneurship
MGB324	Managing Business Growth

Medicinal Chemistry and Biology

Unit List	
Code	Title
STBXMNR-MEDCHBI	
BVB212	Drug Action
BVB221	Nature's Pharmacy
CVB218	Drug Discovery and Design
CVB222	Forensic Analysis of Bio-active Compounds

Physics

Unit List	
Code	Title
ST01MNR-PHYSICS	
Choose four units (48 credit points) from the Unit Option list:	
PVB101	Physics of the Very Large
PVB102	Physics of the Very Small
PVB200	Computational and Mathematical Physics
PVB202	Mathematical Methods in Physics
PVB203	Experimental Physics
PVB204	Electromagnetism

Science and Mathematics Education

Course Notes	
Code	Title
SEBXMNR-SCMAEDU	
EUB012	Learning STEM Through Teaching
SEB200	Communicating Science and Mathematics to Diverse Audiences
SEB300	Science and Mathematics Education Capstone
Select 1 unit (12cp) from:	
EUB107	Introduction to Curriculum, Pedagogy and Assessment (Secondary)
EUB221	Curriculum, Pedagogy and Assessment 1: Mathematics
EUB224	Curriculum, Pedagogy and Assessment 1: Science
PLEASE NOTE:	
The following units which have been discontinued will also count as part of the option units:	
CRB204 Mathematics Curriculum Studies (disc 31/12/18)	
CRB215 Science Curriculum Studies 1 (disc 31/12/18)	

Sustainable Environments for Health

Unit List	
Code	Title
ST01MNR-PUBHLTH	
Select 48cp (4 units) from:	
LSB111	Understanding Disease Concepts
PUB209	Health, Culture and Society

Unit List	
PUB215	Public Health Practice
PUB326	Introduction to Epidemiology
PUB332	Sustainable Environments for Health

Wildlife Ecology

48 credit points of the following	
Code	Title
STBXMNR-WILDECO	
Select 4 units (48 credit points) from the selective list	
BVB204	Ecology
BVB214	Vertebrate Life
BVB225	Ecosystems and Biodiversity
BVB301	Animal Biology
BVB311	Conservation Biology
BVB313	Population Genetics and Molecular Ecology
BVB321	Invasion Ecology
Select ONE of these pre-requisite options if this has not been satisfied elsewhere in your course.	
BVB101	Foundations of Biology
BVB102	Evolution
EVB102	Ecosystems and the Environment

Unit Synopses

BSB115 Management

Equivalents	BSD115, BSX115
Credit Points	12

An ability to understand the basic functions of management and apply that knowledge to contemporary practice are key skills for competent business professionals and informed, effective managers. This unit provides insights into current business issues and practices using real world cases and practitioner readings. The unit introduces students to foundational theories and practices of management and organisations, with an emphasis on the conceptual and people skills that are needed in all areas of management and organisational life. The unit acknowledges that organisations exist in an increasingly competitive environment where the emphasis will be on knowledge and the ability to learn, change and innovate. Organisations are viewed from individual, group, corporate and external environmental perspectives, and the unit provides a foundation for students studying business or wishing to understand more thoroughly the role of organisations within society.

View unit details online | View unit timetable

BVB101 Foundations of Biology

Credit Points	12

Biology is the study of living things. But what is “living”? Cells are considered the basic structural unit of life, existing in diverse forms from simple single-celled microbes to complex multicellular organisms such as plants and animals. Using collaborative approaches in workshops and the laboratory you will investigate the diverse nature of cells and consider how they are built and powered and how they interact and reproduce. You will use the concepts developed in this unit to discuss more complex questions such as “are viruses alive” and “can we synthesise life”'

View unit details online | View unit timetable

BVB102 Evolution

Anti-requisites	NQB422
Credit Points	12

Studying Evolution provides students with the fundamental basis for understanding biological patterns and processes from data sources spanning research from genomes to ecology and fossils. As stated by the famous biologist, Theodosius Dobzhansky (1973), "nothing in biology makes sense except in the light of evolution". Evolution gives an overview of the nature of inheritance, biological variation, natural & sexual selection, adaptation and how these underpin biological diversity and the distributions of all species, both extinct and extant. The primary aim of the unit is to provide the context for you to be able to interpret any biological observation in an evolutionary framework in fields as diverse as conservation and medical genetics. As a foundational unit, knowledge and skills that you gain will be built upon in subsequent units in the biology major as well as in Wildlife Ecology, Environmental Science and Biotechnology & Genetics minors.

View unit details online | View unit timetable

BVB201 Biological Processes

Pre-requisites	BVB101 or SCB112
Credit Points	12

An understanding of processes which occur at the cellular level is fundamental to all aspects of biology. Using a combination of theoretical and laboratory-based approaches to enquiry you will explore the biochemical pathways and processes that facilitate biological function and the genetic mechanisms that control them.

View unit details online | View unit timetable

BVB202 Experimental Design and Quantitative Methods

Pre-requisites	SEB113 or MAB101 or MAB141 or MXB101
Equivalents	NQB421
Credit Points	12

The skills to design, carry out, analyse and interpret experiments are fundamental for scientists. This is particularly important for students of biology and environmental science since environmental variability is an inherent element of the systems that they will need to understand. This unit builds on first year knowledge of the theory of science and the scientific method developed in first year. With field trips it provides real world experience in problem assessment, formulation of testable hypotheses, and experimental design. These critical skills are used and further developed in later units.

View unit details online | View unit timetable

BVB203 Plant Biology

Pre-requisites	BVB101 and BVB102 and BVB201
Credit Points	12

This is a foundational plant biology unit addressing the core concepts of plant function, including structural, physiological and molecular aspects, from the cell to the whole plant. This subject will outline and teach the skills required for measuring and monitoring plant function and an appreciation of how they are influenced by the environment and applied by industry. It introduces the fundamentals of plant physiology, biochemistry and molecular biology in such a way to enable you to understand how plants grow, develop and interact with their environment, and will also be valuable for lifelong appreciation of the potential of agriculture and its contribution to industry and humanity.

View unit details online | View unit timetable

BVB204 Ecology

Pre-requisites	BVB101 or BVB102 or EVB102 or SCB112
Equivalents	NQB321
Credit Points	12

Ecology is the study of the factors and interactions that influence the distribution and abundance of organisms. It is a key component of biology and is central to managing species and ecosystems. This unit examines the major concepts of ecology and develops the conceptual foundation for later subjects in the biology major and minors.

View unit details online | View unit timetable

BVB212 Drug Action

Credit Points	12

Introduction to the classification of bioactive compounds according to the various physiological systems they influence, such as the cardiovascular system, nervous system and respiratory system. The principles of drug action will be discussed, including the concepts of drug specificity, potency and efficacy. These principles will facilitate a basic understanding of toxicology, the development drug tolerance, addiction and withdrawal. Taught in the context human and veterinary medicine, as well as the use of drugs in sport, as poisons, or as food or environmental contaminants, it complements 'Drug Discovery and Design' offered in the same semester. The way in which chemical compounds affect biological cells and systems is fundamental to the study of medicines and toxins. The pharmaceutical, neutraceutical and pesticide industries are major economic forces which offer significant employment opportunities in science.

View unit details online | View unit timetable

BVB214 Vertebrate Life

Pre-requisites	BVB101 or BVB102 or EVB102 or SCB112
Equivalents	NQB423
Credit Points	12

Vertebrates are often the focus of conservation campaigns and environmental impact assessments. Thus, any graduate wishing to pursue a career that involves the biological or environmental sciences must have a deep knowledge of this charismatic group of animals, which includes our most recent ancestors and us. The aim of this unit is for you to gain a deeper understanding of vertebrate evolution, morphology, taxonomy, physiology and ecology through a series of lectures, practicals and field work. The unit will cover evolution of the major groups of vertebrates, considering the fossil record and plausible explanations for major changes such as ‘mass extinctions’. Taxonomy and systematics of the group will be introduced. Physiological systems will be described and consideration given to how they work and operate in an integrated manner. This mid-level unit will give you skills relevant to the biology major, wildlife ecology minor and environmental science major.

View unit details online | View unit timetable

BVB221 Nature's Pharmacy

Credit Points	12

Fundamental concepts and practical skills relevant to plant medicinal biology, chemistry, biochemistry, and pharmacology. It introduces the general classes of medicinal plant compounds, their biosynthesis and function in planta, their purification and analysis, and clinical applications. The unit introduces the pharmacology of specific plant-derived compounds, thereby building upon the knowledge of drug action developed in BVB212. It provides a deeper understanding of the broader technical, social, cultural, and legal challenges in the transition from discovery to application via focused evaluation of existing/emerging global health challenges. The ability to critically evaluate scientific literature, synthesise information, and write effectively is further developed in this unit. This unit develops a broad range of knowledge and practical skills of direct relevance to the pharmaceutical sector, as well as natural product chemistry, plant science, botany, and allied health.

View unit details online | View unit timetable

BVB225 Ecosystems and Biodiversity

Pre-requisites	BVB101 or BVB102 or EVB102 or BZB210
Anti-requisites	BVB223, BVB224
Credit Points	12

There are over one million species catalogued, and several million yet to be described. Familiarity with biological diversity and the role species play within ecosystems is central to biological and evolutionary research, and for developing solutions to sustain the environmental health of our planet. Australia has a largely unique flora and fauna, with a very high proportion of our plant and animal species found nowhere else. While it is impossible to cover every Australian plant and animal in a single unit, we will introduce some key elements of that diversity, with a focus on terrestrial ecosystems and the plants, insects and mammals which occur in them. For students enrolled in biology and environmental science majors this unit provides foundational knowledge to complement areas such as ecology and environmental monitoring; while for education majors the skills gained in creating collections forms a basis for teaching biology in both primary and secondary school.

View unit details online | View unit timetable

BVB301 Animal Biology

Pre-requisites	BVB101 or BVB214 or BZB210
Credit Points	12

An understanding of animal physiology is fundamental to studying the way that animals grow, develop, reproduce and respond to their environments. This unit has a focus on

vertebrate physiology, but will include elements of invertebrate physiology. The unit builds on earlier studies of cells and genes, to explain how the animal functions as a whole, and how different animals have evolved different senses and diverse physiological systems to cope with different environments. Finally, the unit will consider the relationship between animals and humans, placing the topic in a broader societal context. This knowledge will be useful to biology educators and those who wish to pursue further animal studies or research in wildlife, domestic, or companion animals.

View unit details online | View unit timetable

BVB305 Microbiology and the Environment

Pre-requisites	BVB201
Credit Points	12

The biology, evolution and ecology of microorganisms underpin critical, complex and, sometimes, harmful processes in almost every environment on earth, from oceanic vents to the animal gut, in the roots of plants and the health of soil, and even in your shower head. These fundamental biological processes are a rich resource for cutting-edge research and applications of biotechnology.You will conduct original laboratory research and desktop analyses to explore, evaluate and communicate insights into core concepts in microbiology, their functional interactions in the environment, and their exploitation in agriculture, industry and the built environment. Through this, you will build skills in project planning, design, conduct, analysis and communication to address real world applications and prepare you for a key area of post-graduate employment.

View unit details online | View unit timetable

BVB311 Conservation Biology

Pre-requisites	BVB204
Equivalents	NQB622
Credit Points	12

The theory and practice of conservation biology is essential for maintaining viable populations of rare and threatened species and for maintaining essential ecosystem processes. In this unit, you will synthesise a diverse range of information including high quality scientific literature, apply field skills in biodiversity monitoring and prepare written reports that provide an incisive and decisive analysis of key conservation issues. Specific modules will train you to critically analyse the link, or lack of, between theory and application in current conservation management approaches. Scientific methods will be used to develop problem-recognition and problem-solving skills through fieldwork, data collection, analysis and reporting. This advanced unit is essential for anyone wanting to work in areas of wildlife management and conservation.

View unit details online | View unit timetable

BVB313 Population Genetics and Molecular Ecology

Pre-requisites	BVB204
Equivalents	NQB521
Credit Points	12

Understanding the dispersal and movement of genes in populations is fundamental to the management of invasive species, the management of fisheries and wild resources and the conservation of rare species. This unit will provide the theoretical and practical training required for practicing ecologists to use genetic techniques in theoretical and applied settings.

View unit details online | View unit timetable

BVB317 Principles of Genomics and Biotechnology

Pre-requisites	BVB101
Credit Points	12

This unit will introduce students to the basic principles, core concepts and processes that underpin the topics of genomics and biotechnology. The cutting-edge innovations arising from these rapidly emerging and evolving areas have, and will continue to, transform and shape the world we live in with global impacts in human health, agriculture and the environment. The unit will build on the basic cell and molecular biology skills acquired in BVB101 and further develop theoretical knowledge and practical expertise in the cellular and molecular processes and techniques that are used to manipulate and exploit organisms (microbes, animals and plants). Recent technological advances such as gene editing will also be covered in addition to important issues such as regulation and commercialisation of biotechnology process and products. The biotechnology industry is growing rapidly and graduate employment in this sector is expected to be in high demand.

View unit details online | View unit timetable

BVB321 Invasion Ecology

Pre-requisites	BVB202 and BVB204
Credit Points	12

Invasive species cause substantial and costly negative effects to native ecosystems and threaten food security. An understanding of the ecological processes by which they are introduced, establish and spread in new regions is essential for their control. Invasive species are now so widespread that they will be encountered in some way in a wide range of careers in ecology and environmental science. Similarly, while pest species are typically dealt with within agro-ecosystems, managing and reducing large populations in a sustainable manner requires science and sophistication, and often similar ecological principles to dealing with invasive species. Integrating and extending work introduced in earlier units, you will learn the skills and concepts that are necessary to understand, analyse and manage pests and invasive species, and the processes of biological invasion.

View unit details online | View unit timetable

BVB328 Applications in Biotechnology

Pre-requisites	BVB317 or BVB201
Credit Points	12

Biotechnology underpins the manufacture of a wide variety of products on which society depends. Such products include pharmaceuticals, chemicals, fuels, and foods. With the major advances in biotechnology and the ability to engineer biological

systems in recent decades, biotechnology offers the generation of better products at lower cost with reduced environmental impacts. As such, both established companies and start-ups are making a major impact on the global stage to deliver products that we use every day. You will learn about a variety of biotechnology applications from both a technical and a business perspective. Your learning will be contextualised with local and international biotechnology company case studies and you will perform an entire biotechnology process during practical classes. At the end of the unit you will have a deep understanding of the biotechnology industry and the technologies that underpin it as well as an awareness of the opportunities it offers.

View unit details online | View unit timetable

BVB330 Synthetic Genomics

Pre-requisites	BVB317
Anti-requisites	BVB314, BVB327
Credit Points	12

The field of Synthetic Biology has emerged from decades of advances in DNA sequencing and editing technologies. Thanks to the increasing information available describing DNA sequence-function relationships, scientists can design and build new biological parts (like enzymes), new genetic programs (connecting multiple biological parts), and even new organisms. These products of synthetic biology are used improve agricultural practices, reduce pollution, develop new therapeutics, and create new bio-based chemicals and materials. In this unit you will be introduced to bioinformatic tools for analysing DNA, and for designing new genetic circuits. You will apply this knowledge to design, edit and implement genetic programs *in vitro* and in live organisms, and develop data analysis skills.

View unit details online | View unit timetable

CAB201 Programming Principles

Pre-requisites	IFB104 or ITD104 or MZB126 or EGD126 or ENB246 or MXB103 or INB104 or MAB220
Anti-requisites	ITD121
Equivalents	INB270, IND270
Credit Points	12

This unit builds on the gentle introduction to programming provided in IFB104 or MZB126. In those units students learn how algorithms are constructed by combining the logical structures of Sequence, Selection and Iteration. Students also learn how functions can be used to abstract and reuse sections of code. These concepts are reinforced in this unit and extended with additional applications of abstraction necessary to combat complexity when building larger systems. Object-oriented principles are introduced where the program is structured around classes of objects that are identified from the real-world providing a high-level architecture that is better able to stand the test of time as requirements evolve throughout the lifetime of the system. This unit provides the foundation for the other more advanced and specialized programming units.

View unit details online | View unit timetable

CVB101 General Chemistry

Anti-requisites	CZB190
Equivalents	SCB111
Credit Points	12

This foundation chemistry unit covers the core concepts and laboratory practices that we use to define the nature of atoms and the different forms of matter, to quantify chemical reactions & chemical reaction processes through the application of thermochemistry, kinetics and chemical equilibria. The understanding of these chemical concepts is essential to knowing why matter in our universe exists in specific forms and how it transforms. This knowledge is the foundation upon which the other scientific disciplines and applied disciplines are based. This is an introductory unit. The knowledge and skills developed in this unit are relevant to both chemistry major students and non-majors alike. CVB102 Chemical Structure & Reactivity builds on this unit by focusing on applications to chemical reactions and their relationship to chemical structure, with a particular focus on organic chemical synthesis and laboratory practices and reporting requirements with regards to organic chemistry.

View unit details online | View unit timetable

CVB102 Chemical Structure and Reactivity

Anti-requisites	CZB190, CZB191, CVB103, LQB180
Equivalents	SCB121
Credit Points	12

Chemistry relates to all aspects of our lives. An understanding of chemistry is necessary to make sense of our world and to address the global challenges faced by our society. Together with its companion unit, CVB101 General Chemistry, this unit provides you with a foundation in the science of Chemistry. It focuses on how atoms bond to form molecules, and the models chemists use to understand molecular structure. You will learn how to predict the reactivity and properties of molecules and will get a foundational introduction to organic and biological chemistry. You will develop your ability to apply theoretical knowledge and critical thinking to solving chemical problems. You will also complete a suite of laboratory practical experiments, where you will develop professional skills in chemical manipulation, analysis, safe laboratory practices, data recording and analysis. This unit is a foundation for higher-level courses in organic chemistry, materials science and biochemistry.

View unit details online | View unit timetable

CVB201 Inorganic Chemistry

Pre-requisites	(CVB101 and CVB102) or (SCB111 and (SCB121 or CVB102))
Anti-requisites	PCB334
Equivalents	PQB331
Credit Points	12

The fascinating and diverse chemistry of transition metals and main group elements is explored in detail from the fundamentals of electronic structure and bonding through to metal complex structure, symmetry, isomerism and chirality, magnetism, reaction mechanisms and molecular orbital theory. Learning is

enhanced through a range of practical laboratory activities that enable understanding of theory through experiment. Core laboratory skills in the handling and synthesis of a wide variety of metal complexes will be developed and techniques such as magnetometry, UV-visible spectroscopy and spectropolarimetry will be introduced and used to discern metal complex structure and function. The knowledge and skills developed in this unit underpin further studies in physical, organic and coordination chemistry.

View unit details online | View unit timetable

CVB202 Analytical Chemistry

Pre-requisites	(CVB101 or SCB111 or CZB191) and (SCB121 or CVB102) and (SCB131 or CVB102)
Equivalents	PQB312
Credit Points	12

This unit is an introduction to modern chemical analysis, including some common instrumental techniques, which are firmly linked to the theory and practice of the discipline in a modern, working laboratory. You will gain essential analytical and deductive skills for chemical science as well as laboratory-based experience in sampling, treatment of samples, principles and practice of making high-quality chemical measurements with chromatographic and spectroscopic instrumentation. This unit further develops your knowledge and technical laboratory skills in chemical instrumentation and analysis. It links to the work previously undertaken in CVB101 General Chemistry and prepares you for the final semester major capstone unit CVB304 Chemistry Research Project.

View unit details online | View unit timetable

CVB203 Physical Chemistry

Pre-requisites	(CVB101 or SCB111) and (SCB121 or CVB102) and (SCB131 or CVB102)
Anti-requisites	PCB354, PCB405
Equivalents	PQB401
Credit Points	12

This is a developmental unit that covers concepts that determine how chemical systems behave. It covers the discrete nature of atoms and molecules through spectroscopy, and develops understanding of the thermodynamics and kinetics of chemical processes. Theoretical and practical-based approaches are to develop understanding of the nature of the physical properties and dynamic transformations of matter essential to all branches of chemistry and to other disciplines based on physical materials, or that use and rely on chemical reactions. This unit builds on knowledge and practical skills introduced in CVB101 General Chemistry, it expands on the concepts introduced in CVB101 and prepares for CVB302 Applied Physical Chemistry.

View unit details online | View unit timetable

CVB204 Organic Structure and Mechanisms

Pre-requisites	(CVB101 or SCB111 or CZB191) and (SCB121 or CVB102) and (SCB131 or CVB102)
Anti-requisites	PQB401
Pre-requisites	(CVB101 or SCB111 or CZB191) and (SCB121 or CVB102) and (SCB131 or CVB102)
Credit Points	12

Build on the organic chemistry knowledge and laboratory skills gained in CVB101 and CVB 102. The deeper understanding of reaction mechanisms, instrumental characterisation and stereochemistry are important in facets of all subsequent chemistry units. Perhaps most importantly, this unit will be used as the foundation for advanced studies in organic chemistry in CVB 301 Organic Chemistry: Strategy for Synthesis. To successfully complete this unit you will: -Describe the electronic effects and mechanistic concepts which govern the reactions of organic compounds. -Predict the outcome of a set of reaction conditions when applied to organic compounds. -Design syntheses based on the major functional groups. -Deduce the solution of synthetic problems in organic chemistry -Apply modern spectroscopic techniques as an aid to structure elucidation -Demonstrate a range of practical skills in safe laboratory practice applied to the synthesis, isolation and purification of organic compounds.

View unit details online | View unit timetable

CVB211 Industrial Chemistry

Equivalents	PQB623
Credit Points	12

It is essential that chemists and process engineers involved in industrial chemical production translate fundamental knowledge of chemistry and process engineering into practical outcomes. In this unit you will focus on green chemistry, industrial biotechnology and catalysis which underpins 90 % of all chemicals made today. You are introduced to catalyst fundamentals and their application to industry for bulk chemicals, production of polymers and plastics, zeolites for green chemistry and bio-catalysts such as enzymes. You will also be guided through the development of professional skills which includes creation of a MindMap, completion of a Dynamic SWOT analysis, and presentation of business ideas in a poster. This unit primarily builds upon fundamentals learned in Process Principles and Unit Operations courses.

View unit details online | View unit timetable

CVB212 Industrial Analytical Chemistry

Pre-requisites	(CVB101 or SCB111) and (SCB121 or CVB102) and (SCB131 or CVB102)
Equivalents	PQB313
Credit Points	12

The modern chemical industry requires comprehensive analytical measurement relating to raw materials, process streams and outputs in order to control quality and to confer error prevention. This unit further develops your knowledge and technical laboratory skills in chemical instrumentation and analysis in applications relevant to the chemical industry. It links to the work previously undertaken in CVB101 General Chemistry and prepares you for the final semester major capstone unit CVB304 Chemistry Research Project.This unit aims at extending your foundational chemistry in areas of chemical applications that are relevant to the industry. In particular, this unit provides you with the theoretical knowledge and practical capabilities for

chemical analysis and measurements that are widely used in industrial analytical laboratories as well as outlining the future direction of this area.

View unit details online | View unit timetable

CVB215 Criminalistics and Physical Evidence

Equivalents	SCB384
Credit Points	12

This unit introduces the current technologies used by crime scene investigators to investigate crime scene and identify evidence. This unit will introduce the students to the realm of forensics and its role in criminal investigations. The student will be introduced to the fundamentals of chemical and physical sciences used for evidence collection, preservation and analysis. The unit will bring to the students hands-on experience in crime scene investigations, questioned documents and fingerprinting.

View unit details online | View unit timetable

CVB216 Forensic Chemistry

Anti-requisites	PQB684
Credit Points	12

Forensic Chemistry is dedicated to the screening and quantification of any substance, compound or material that may be abused or cause harm to humans, environment or infrastructure. A forensic chemist is a professional chemist who analyzes unknown substances and other forms of evidence using advanced chemical technologies. The forensics scientist uses in-depth scientific knowledge to interpret the anlysis results and arrive to correct non-biased conclusions on the evidence. In the Forensic Chemistry unit, students will gain expertise in all the major branches of chemistry (organic, inorganic, physical and especially analytical & bio-analytical) as related to forensic investigations. The analytical aspect of the course has been broadened from a more traditional chemistry focus to include modern and special types of analysis of importance to forensic science.

View unit details online | View unit timetable

CVB217 Digital Forensics

Equivalents	PQB584
Credit Points	12

Cyberspace is increasingly turning into a place where criminal acts are committed. This requires law enforcement agencies, businesses and other organizations to develop new competences. The evolving sophistication of computer crime, together with the methods and tools required to detect and deal with it, demand the timely development underlines the need for forensic scientists with relevant IT skills required by employers. In the case of forensic computing, there are two main areas of possible employment. Firstly, the police force with its need to develop high technology crime units, and secondly the private companies that wish to deal with a variety of illegal behaviour involving their technology. Both areas are predicted to grow quickly in the coming years and it is expected that the job market for graduates skilled in forensic computing will grow concomitantly. This unit will introduce you to a new area of next generation forensics.

View unit details online | View unit timetable

CVB218 Drug Discovery and Design

Credit Points	12

This unit investigates the evolution of the pharmaceutical industry, modern drug discovery methods and drug targets and explores the concept of chemical structure in relation to drug properties and drug design. The unit provides knowledge and skills at the interface between chemistry and biology relating to the drug discovery process. As the pharmaceutical industry represents a large international concern, offering many employment opportunities, and there is also significant growth in the bio-economy, dealing with bioactive molecules such as food additives and supplements, cosmetics, pesticides and other agricultural bio-chemicals, it is important for students to develop a broad appreciation of the pharmaceutical industry at large. This unit builds on foundation chemistry and biology knowledge as part of the Medicinal Chemistry and Biology minor and complements the BVB212 Drug Action unit.

View unit details online | View unit timetable

CVB221 Unit Operations

Equivalents	PQB525
Credit Points	12

This unit fosters a deeper understanding of the unit operations which are the main components in process flow diagrams. The students will be introduced to among other concepts in the water and wastewater treatment industry disinfection, filtration, ion exchange, adsorption and desalination. Complementary theory regarding mass and heat transfer operations will also be used to ultimately provide a comprehensive overview of water treatment and chemical processes. This unit aims to bridge the gap between academic learning and industrial practice. Examples relating to key industries such as the coal seam gas, mining, manufacturing and wastewater sectors will be provided and cutting edge problems discussed. Students will learn the key skills which industry expects graduates to possess in order to rapidly integrate into project teams.

View unit details online | View unit timetable

CVB222 Forensic Analysis of Bio-active Compounds

Credit Points	12

This unit provides an introduction to the basics of bio-analytical methods used for the detection and identification of bio-active substances in different matrices. The methods are demonstrated to bio-active compounds that are frequently encountered in pharmaceutical, forensic, molecular diagnostics and environmental industries. The unit will introduce modern instrumental analytical platforms such as spectroscopy, chromatography, electrophoresis, nanosensors and immunoassay.

View unit details online | View unit timetable

CVB225 Forensic Biology and Analytical Toxicology

Anti-requisites	LQB680, PQB680
Credit Points	12

The extensive use of biological evidence to identify victims and offenders as well as indicate attempts to control victims prior to abuse or attack has had a significant bearing on the course of law enforcement investigations, criminal court proceedings, and victim service providers. DNA and toxicology evidence have become a highly influential piece of the crime puzzle. You will be introduced to the concepts of DNA profiling and analytical toxicology and their applications in forensic case work. You will develop the necessary skills for analysing and interpreting DNA and toxicology evidences and be introduced to the basic concepts of forensic anthropology. This learning will be through the study of the theory, hands-on practices relevant to real life scenarios as well as training on the forensic interpretation of the evidence.

View unit details online | View unit timetable

CVB301 Organic Chemistry: Strategies for Synthesis

Pre-requisites	CVB101 and CVB102 and CVB204
Equivalents	PQB531
Credit Points	12

Learn skills in the synthesis of organic molecules and an analysis of the nature of the reaction mixtures and products generated. Apply the principles of synthetic design, using their knowledge of a range of synthetically useful organic reactions and the concept of retrosynthesis. You will learn to evaluate experimental data qualitatively and quantitatively, especially with regard to IR and NMR spectroscopic data, and use this knowledge to deduce and explain conclusions based on logical arguments. You will be able to use creative design strategies to overcome common synthetic organic problems by applying the principles of protecting group strategies and selectivity in organic synthesis. The application of practical skills in safe laboratory practice relating to the principles of synthesis, isolation and purification of organic compounds will allow you to demonstrate their capabilities as well as develop skills to document their findings in an appropriate work orientated format.

View unit details online | View unit timetable

CVB302 Applied Physical Chemistry

Pre-requisites	CVB203
Equivalents	PQB502
Credit Points	12

Physical chemistry is a discipline of chemistry in which the physical factors which govern chemical reactions and interactions are described, quantified and explored. This unit will explore the effects of the underlying principles of thermodynamics and kinetics to chemical and physical processes which commonly occur around us. The principles that govern the macroscopic behavior of solids, liquids and gases, the fundamental physical properties which determine the extent of reaction and the speed with which it occurs will be explained. These thermodynamic principles are extended to mixtures, the properties of solutions, polymeric systems and electrochemistry which all play a very important role in the world around us.

View unit details online | View unit timetable

CVB303 Coordination Chemistry

Pre-requisites	CVB201
Equivalents	PQB631
Credit Points	12

Coordination chemistry - the chemistry of transition metal complexes - encompasses aspects of organic, physical and transition metal chemistry. Deep understanding of the electronic structure of these remarkable compounds is developed along with an exploration of fascinating topics of current international research interest including organometallic compounds, bioinorganic chemistry, coordination polymers, metal-organic-frameworks (MOFs) and other metallo-supramolecular species. Synthesis and characterisation skills are honed through laboratory exercises drawing on knowledge developed throughout the chemistry major including magnetometry, thermogravimetric analysis and UV-visible, infrared and NMR spectroscopy.

View unit details online | View unit timetable

CWB111 Scientific and Technical Writing

Equivalents	KWB114
Credit Points	12

This unit introduces you to the principles of writing clearly in a science-based context and to the discursive frameworks that inform scientific and technical writing. It aims to provide you with an understanding of the conventions of writing and publishing scientific and technical information and to develop skills in communicating this information for a general audience. Graduates in the fields of engineering, science and information technology are required to assess high volumes of information and to communicate key scientific and technical ideas to a general audience. As such, there are growing industry and research demands for graduates with professional writing skills that deliver clear and well-structured written information about complex material.

View unit details online | View unit timetable

EGB262 Process Principles

Equivalents	CVB220
Credit Points	12

This unit introduces students to the fundamental approach involved when taking a chemical reaction from the laboratory to full scale industrial implementation. Aspects such as health and safety considerations, environmental issues, quality control, product design, process constraints, economics, mass & heat balance, chemistry and process engineering will be discussed. Examples of how professionals integrate this knowledge into practice will be provided and the design process for improvement illustrated. Students will gain an understanding of how to interact with a multi-disciplinary team to obtain satisfactory technical solutions to a wide range of problems. This introductory (second year) unit prepares you for more advanced study in process modelling.

View unit details online | View unit timetable

EGB361 Minerals and Minerals Processing

Pre-requisites	CVB101
Equivalents	ENB361
Credit Points	12

Minerals processing is the science and engineering behind the transformation of ores to value-added products. This unit aims to provide you with the fundamental knowledge of different stages of a mineral processing plant and to apply this knowledge in the laboratory and through virtual simulations. The role of mineral processing is to optimise mineral recovery processes using the most economical pathways, while also meeting strict environmental standards. This unit provides you with opportunities to design, practice and provide evidence of your problem solving skills and overall knowledge of mineral processing.

View unit details online | View unit timetable

ERB101 Earth Systems

Equivalents	NQB201
Credit Points	12

Earth Science impacts every aspect of modern life. The concepts of Earth Science are fundamental not only to the field of Geology, but also to Environmental Science, natural resource management, civil engineering and society at large. Earth Systems introduces Earth Science, including earth materials, geologic history, geological and physical geography process at the Earth's surface, and the complex interplay between the lithosphere and landscapes. Additionally, the unit provides readily accessible examples of the use of scientific reasoning for understanding complex natural systems. Hence, Earth Systems is a foundation unit for further studies in Geology and Environmental Science, but more importantly, serves as a broad introduction to the very world we live on, and to the ways of science in general. Such a background is highly desirable for any informed citizenry for understanding complex issues of resource, environment, and societal development.

View unit details online | View unit timetable

ERB102 Evolving Earth

Equivalents	NQB202
Credit Points	12

In ERB102 Evolving Earth you will focus on key events in the history of our planet – the formation of our planet, the concept of geologic time, the origin of the oceans and atmosphere and the evolution of life. You will learn about the connections between the evolution of life and geological processes and events, to appreciate the complexity of life that exists on Earth today. This provides a fundamental introduction to evolution and geological time and prepares you for more in-depth exploration of Earth system connectivity, natural hazards, environmental management and climate change.

View unit details online | View unit timetable

ERB201 Destructive Earth: Natural Hazards

Credit Points	12

In ERB201 Destructive Earth, we will focus on the Science of Natural Hazards. By understanding the conditions and processes that lead to, and cause, severity of natural processes such as earthquakes, tsunamis, volcanic eruptions, landslides, cyclones, tornadoes, storms/blizzards, floods, bushfire, and asteroid impacts, you will be better informed as to why there are natural hazards and disasters, and how to prepare and mitigate for future events that will have a range of social, economic and political impacts. We will build on the knowledge and skills developed in Year 1 to provide you with a global perspective of how we, as a society, will continually be confronted by natural hazards.

View unit details online | View unit timetable

ERB202 Marine Geoscience

Credit Points	12

Oceans make up 70% of the Earth's surface, yet less than 5% of them have been explored. There is therefore still much to learn about the marine environment, marine resources and management. This unit will develop a detailed understanding of oceanography, carbonate geology and reef structures, marine biota and interpretation of depositional processes and products in the shallow through to the deep marine environment.

View unit details online | View unit timetable

ERB203 Sedimentary Geology and Stratigraphy

Pre-requisites	ERB101 and ERB102 and ERB202
Anti-requisites	NQB413
Credit Points	12

This unit provides you with an introduction to sedimentology and stratigraphy, incorporating sediments and sedimentary rocks and how they relate to depositional environments. The unit focuses on the link between features preserved in sedimentary rocks and what those features tell us about how the rock was emplaced, the environment it was emplaced into and the subsequent burial history of the rocks. Sedimentology and stratigraphy is a fundamental part of the education of any earth scientist, and especially of those who wish to be involved in fossil fuel (i.e., coal, petroleum and gas) exploration, water resource exporation and management, and environmental geology, such as geosequestration of carbon dioxide, landscape remediation and soil science, investigation of extreme events (e.g., landslides, tsunami and storm surge) and climate change.

View unit details online | View unit timetable

ERB204 Deforming Earth: Fundamentals of Structural Geology

Pre-requisites	ERB101 and (SEB113 or MXB105 or MZB125)
Equivalents	NQB412
Credit Points	12

This unit develops the knowledge and skills required to recognise, classify, describe, record, and interpret deformation structures in rocks, from the scale of millimetres to kilometres. Rock deformation driven by plate tectonics is a fundamental process that shapes the lithosphere of our planet and the complex 3D spatial distribution of rocks within it. It is integral to the study of the solid Earth and touches almost all geological

disciplines.

View unit details online | View unit timetable

ERB205 Earth Materials

Equivalents	NQB311
Credit Points	12

Earth Materials comprises the study of minerals and rocks which form the solid Earth. The study of Earth Materials is essential for understanding the structure and composition of the earth and the detailed processes of the rock cycle. Earth Materials forms the basis for petrology (the study of the genesis of rocks) and geochemistry.

View unit details online | View unit timetable

ERB206 Petrology

Pre-requisites	ERB205
Equivalents	NQB411
Credit Points	12

Petrology is the study of Igneous and metamorphic rocks. These rock types compose the bulk of the Earth. Understanding what these rocks are and how they form is an essential part of the study of geoscience and is fundamental to a wide range of higher level units. This unit focuses on the description, classification and origins of igneous and metamorphic rocks.

View unit details online | View unit timetable

ERB301 Chemical Earth

Pre-requisites	ERB101 and ERB102
Equivalents	NQB615
Credit Points	12

Earth Science examines the interaction of physical, biological and chemical processes in the fractionation and differentiation of the Earth. Geochemistry is therefore an essential component of understanding the origin of the Earth, its evolution through time and the functioning of systems that are active today. This unit aims to apply and develop your theoretical knowledge and practical skills, to use and apply a wide range of geochemical tools available to the modern scientist to address a variety of geological and environmental problems.

View unit details online | View unit timetable

ERB302 Applied Geophysics

Pre-requisites	ERB204 and (SEB113 or MXB105 or MAB101 or MAB141 or MAB105)
Equivalents	NQB513
Credit Points	12

Applied geophysics provides geoscientists with the tools to investigate the generally inaccessible subsurface. These tools enable us to detect temporal and spatial changes in the physical properties of Earth. Knowledge of material properties such as density, electrical resistivity, magnetisation, elasticity and natural radioactivity is essential for the exploration of minerals, hydrocarbons and groundwater. Beyond exploration geophysical methods are used in disciplines as diverse as plate tectonics, environmental geology, engineering geology, and seismic hazard assessment.

View unit details online | View unit timetable

ERB303 Energy Resources and Basin Analysis

Pre-requisites	ERB203 and ERB302
Equivalents	NQB612
Credit Points	12

The vast majority of the world's energy is derived from fossil fuels. Advanced concepts of stratigraphy and basin analysis are fundamental for exploration, evaluation, exploitation and conservation of oil, gas, coal and water in sedimentary rocks. Knowledge of subsurface geologic methods using core, well and geophysical data is essential for anyone wishing to enter the petroleum, coal or strata-bound minerals industry. This unit will cover advanced basin analysis concepts and combine project based learning and practical exercises to provide insight into the exploration of petroleum and other natural resources.

View unit details online | View unit timetable

ERB304 Dynamic Earth: Plate Tectonics

Pre-requisites	ERB203, ERB204 and ERB302
Equivalents	NQB613
Credit Points	12

How we think about Earth processes and evolution has been revolutionised by the recognition that rigid plates forming the outer layer of the Earth move relative to one another and interact at their boundaries. This notion is a cornerstone of the unifying theory of Plate Tectonics. In this unit, you will be introduced to the driving mechanisms of motion and deformation within of the Earth and how they relate to the driving forces of Plate Tectonics. You will become familiar with the igneous, metamorphic and sedimentary responses associated with specific tectonic environments, and how they have evolved through Earth's evolution. This is a synthesis course integrating all knowledge that you have gained from your Earth Science Major units.

View unit details online | View unit timetable

ERB305 Geological Field Methods

Pre-requisites	(ERB203 or NQB413) and (ERB204 or NQB412) and (ERB206 or NQB411)
Equivalents	NQB502
Credit Points	12

Field experience is an essential part of the professional training of geologists, environmental scientists and natural resource specialists in general. The theory and practice of methods to map, measure and interpret important geological features and characteristics are essential to the study of geology. Methods of mapping, orientation and interpretation are necessary skills for resource assessment, geo-exploration and environmental impact assessment. This unit assumes knowledge of geological principles and methods, namely structural geology and lithology (sedimentary, igneous and metamorphic rocks). It provides professional experiences that are essential for the employability for geology graduates.

View unit details online | View unit timetable

ERB306 Earth's Mineral Resources

Pre-requisites	ERB204 and ERB206 and ERB301
Equivalents	NQB512
Credit Points	12

A mineral resource represents an enrichment of an element or mineral that can be mined for a profit, and Australia's wealth and future economic growth depend largely on these resources. Develop a theoretical background and understanding of the major aspects of mineral resource formation; develop the practical skills to describe and interpret mineralised rocks and their host sequences; and plan and execute an exploration program. Learning approaches include, lectures (including guest industry lectures) and practical sessions using samples from famous ore bodies across the globe (hand samples and thin sections for microscopic study). Students are assessed based on a group project and theoretical and practical exams. Many students find the semester-long mineral exploration group project a highlight, as students get an opportunity to use a variety of real datasets to 'explore' for mineral prospects. The JK Education Endowment Award is given to the group with the top mark.

View unit details online | View unit timetable

ERB310 Groundwater Systems

Pre-requisites	ERB101 or EVB312
Equivalents	NQB614
Credit Points	12

This unit focuses on the origin, occurrence and movement of groundwater; aquifer properties; chemistry and quality of groundwater; exploration methods for groundwater; drilling methods and well testing equipment; assessment of groundwater problems, both supply and quality; and introduction to modelling of groundwater systems. Groundwater resources of Australia and current issues associated with these resources are covered.This unit builds on knowledge of soil and water chemistry from "Soils" and "Environmental pollution". Through working on real world assessment tasks, you will learn how to collect, analyse and interpret groundwater data. These skills will prepare you for any role where groundwater may be encountered (including government, industry and consulting roles).

View unit details online | View unit timetable

EUB012 Learning STEM Through Teaching

Equivalents	CRB040
Credit Points	12

This unit provides you with an opportunity to explore your potential as a STEM educator and communicator, while gaining a better understanding of the enablers and barriers to your own learning processes. It introduces you to the essentials of teaching and learning, combining theoretical elements such as educational design and learning theories with practical, real world skills in observing, planning, presenting and communicating effectively. Such skills and knowledge are necessary in a wide range of STEM professions and will help you build confidence and expertise in presenting to groups. This introductory unit is interactive and collaborative, rewarding your engagement in a variety of group and individual activities. It can be taken as a single option or as the initial unit in the Science and Mathematics Education minor, which builds upon and contextualises the foundational skills developed in EUB012.

View unit details online | View unit timetable

EUB107 Introduction to Curriculum, Pedagogy and Assessment (Secondary)

Anti-requisites	EUB129 - Introduction to Curriculum, Pedagogy and Assessment: Double Degree
Credit Points	12

This unit introduces the theory and practice of teaching and learning cycles that integrate curriculum, pedagogy and assessment to design lesson plans for secondary students. You will learn how to plan a lesson in your first teaching area using knowledge of student learning, curriculum sources, teaching strategies, and responsive formative assessment (informal and formal, diagnostic and summative). You will have opportunities to conduct classroom observations of students and teachers engaged in learning (via visiting or virtually engaging with schools). This introductory unit provides context for applying the theoretical knowledge of teaching and learning cycles. You will be introduced to national and state curricular documents, pedagogic frameworks and assessment for learning theories that inform contemporary teacher practice. The unit provides a foundation further developed through professional experiences and child and adolescent learning units.

View unit details online | View unit timetable

EUB221 Curriculum, Pedagogy and Assessment 1: Mathematics

Pre-requisites	EUB107 or EUB012 or EUB129
Anti-requisites	CRB204 - Mathematics Curriculum Studies 1
Credit Points	12

Mathematics is a constantly evolving field of inter-related and inter-dependent concepts and systems that can be applied to model and reason about phenomena from other disciplines. Building upon your prior learning and experience, including your first professional experience, this unit will explore mathematics curricula, with a focus upon junior secondary (Years 7-10) in the Queensland context. Through a consideration of subject matter from the Australian Curriculum: Mathematics, key principles and practices of contemporary mathematics pedagogy will be explored. You will apply your understanding of subject-matter, topic-specific pedagogy and formative assessment knowledge to the sequencing and design of learning activities suitable for use in a junior secondary classroom. The knowledge, understanding and skill developed in this unit will prepare you to plan and teach mathematics lessons in your subsequent professional experience, and will be further extended in EUB321.

View unit details online | View unit timetable

EUB224 Curriculum, Pedagogy and Assessment 1: Science

Pre-requisites	EUB107 or EUB012
Anti-requisites	CRB215

Pre-requisites	EUB107 or EUB012
Credit Points	12

This unit develops your understanding of Science curriculum, pedagogy and assessment. Building upon your learning in EUB107 Introduction to Curriculum, Pedagogy and Assessment (Secondary), contemporary pedagogical approaches for teaching science will be explored in conjunction with the requirements of the Australian Curriculum: Science. You will apply your understanding of discipline content knowledge (i.e., Biology, Chemistry, Physics, Earth and Space sciences) as well as pedagogical and assessment knowledge to the design of learning activities suitable for a junior secondary classroom (years 7-10). The knowledge, understanding and pedagogical skills developed in this unit will assist you to plan and teach a science lesson. Mapping of junior science content to the senior syllabus will prepare you for further extension in EUB324 Curriculum, Pedagogy and Assessment 2: Science.

View unit details online | View unit timetable

EUB251 Environment and Society

Equivalents	CRB110
Credit Points	12

This unit provides an applied geography approach to understand the dynamic nature of interactions between people and their environments, and the ways environments influence people's attitudes, perceptions, choices and decisions. This is a skills-based unit that provides an opportunity to transform, represent and analyse geographical data and information to recognise spatial and temporal patterns and trends and explain how these represent contemporary geographical challenges.The skills developed in this unit are applicable across a range of other academic geography and social science subjects and are utilised by specialists in a diverse range of professions including economists, demographers, spatial technicians, criminologists, environmental analysists and managers, urban and regional planners and those in hazard management professions.

View unit details online | View unit timetable

EVB102 Ecosystems and the Environment

Credit Points	12

Like all other species on the planet, humans extract energy and materials from their surrounding environment and as a result of that activity, modify ecosystems. We are part of the earth's ecological systems, and our ability to understand and manage our impact on the environment must be based on a sound knowledge of ecosystems ecology. This first year unit provides an introduction to ecosystems science through a series of lectures, workshops and field work. The unit focuses on broad-scale factors that shape ecosystems, such as energy transfer, materials cycling, climate and soils and examines the ecological patterns that emerge as a result. This knowledge is then used to assess ecosystem change and human impact on the environment. This foundational unit is relevant to environmental science and biology students and those with an interest in understanding the natural science components of sustainability.

View unit details online | View unit timetable

EVB203 Geospatial Information Science

Pre-requisites	ERB101 or EVB102
Equivalents	UDB181
Credit Points	12

This unit introduces the theory and concepts of digital geographic information science with a focus on discovering the power of location in the interpretation of earth and environmental data. Students record and create geospatial information that they share and combine to class data sets for mapping and analysis. Follow a typical project workflow from collecting attributes of specific locations, data preparation, formatting and quality control. Skills in spatial and attribute accuracy and precision are developed through fusion of class data sets. Cartographic products are created to meet a range of client needs and assessed for accuracy, completeness and appropriateness. Final report assessment demonstrates spatial analytical thought by proposing a quantitative solution to a series of problems based on the class data set. Think spatially about process and pattern, create informative and accurate geographic information and reporting products based on real world geospatial data sets.

View unit details online | View unit timetable

EVB221 Remote Sensing of the Environment

Credit Points	12

This Unit provides an introduction to Earth observation using remote sensing that includes properties of the basic resolutions of remote sensing, and interaction of the electromagnetic radiation (EMR) with different features and phenomena. The technology and science that allow data collection, calibration and analysis are covered using a range of satellite and sub-orbital imagery sources. Students develop digital image processing and classification workflows to prepare and present geospatial information products with quantified accuracy. Students also develop and demonstrate their ability to use spectrophotometers, active remote sensing platforms and modern digital photogrammetry workflows. Students will be able to accurately use and create remotely sensed information products suitable to other geospatial and environmental applications. This Unit applies theoretical concepts to develop basic remote sensing skills suited to a range of environmental and development related fields.

View unit details online | View unit timetable

EVB302 Environmental Pollution

Pre-requisites	BVB202 or MZB126
Credit Points	12

This unit deals with major problems of pollution of water, the land surface and the atmosphere. It covers processes responsible for the occurrence and release of pollutants in the environment, dispersion mechanisms, the hazards associated with different types of pollutant, accumulation of toxic substances, and procedures for the reduction of emissions and remediation of contaminated environments. It applies your learning from the Experimental Design and Quantitative Methods unit, BVB202 to assess and report on environmental pollution.

View unit details online | View unit timetable

EVB312 Soils and the Environment

Pre-requisites	ERB101
Anti-requisites	EVB212
Credit Points	12

This unit will provide you with grounding in soil science and its application to environmental soil analysis and management, the importance of soil for ecosystem function in a changing environment, and the critical role of soils in the context of climate change. The unit links biological, ecological and geological systems and contributes to your understanding of the complexity of environmental systems in general.

View unit details online | View unit timetable

IFB102 Introduction to Computer Systems

Anti-requisites	ITD102
Equivalents	IND102
Credit Points	12

This is an introductory computer science unit concerning computer systems, in particular how modern computer systems work, how they are structured, and how they operate. Computer systems are ubiquitous and yet they are unlike any other man-made product or system; they appear magical and are notoriously difficult to work with and manage in projects. This unit's goal is to demystify computer systems so students can appreciate, understand and utilise computer systems in their subsequent learning, and effectively participate in the IT industry. Students will study computers, networks, operating systems and the Web. Raspberry Pi computers will be used throughout the unit and at the end students will build their own small computer system using a Raspberry Pi.

View unit details online | View unit timetable

IFB104 Building IT Systems

Anti-requisites	ITD104
Equivalents	INB104, IND104, ITB001
Credit Points	12

This unit provides a hands-on introduction to computer programming for students with no prior coding experience at all. It introduces the basic principles of programming in a typical imperative language, including expressions, assignment, functions, choice and iteration. It then shows how to use Application Programming Interfaces to complete common Information Technology tasks such as querying databases, creating user interfaces, and searching for patterns in large datasets. The emphasis is on developing skills through practice, so the unit includes numerous coding exercises and assignments, using a simple scripting language and code development environment. The unit establishes a foundation for later subjects that teach large-scale software development using industrial-strength programming languages.

View unit details online | View unit timetable

JSB171 Justice and Society

Equivalents	JSB131, JSB011, JSB101
Credit Points	12

An understanding and appreciation of the complexities of social justice, and particularly their impact on criminal justice outcomes in our society, is a key skill for competent justice professionals. This unit provides the foundational sociological and criminological knowledge that is necessary to understanding justice in a social context, and which is essential for ensuring justice professionals act in socially just and ethical ways.

View unit details online | View unit timetable

JSB174 Forensic Psychology and the Law

Anti-requisites	PYB215
Equivalents	JSB136
Credit Points	12

Forensic Psychology is readily acknowledged as one of the fastest growing areas of psychology in the world. Psychologists are now involved significantly in policing, judicial procedures and correctional processes. The term 'forensic' literally means 'of or used in law courts' (Australian Oxford Paperback Dictionary). The phrase 'psychology and the justice system', however, is now used more generally to describe the different ways in which psychology and law intersect - namely the psychology of the law, psychology in the law, and psychology by the law. By its very nature the study of psychology and law draws from a wide multidisciplinary base for the application of specialised knowledge. As a student of this discipline area, you will need a broad introductory appreciation of (and a critical perspective on) what the study of psychology involves.

View unit details online | View unit timetable

JSB178 Policy, Governance and Justice

Equivalents	JSB081, JSB251,JSB271
Credit Points	12

This unit is designed to introduce students to the practice and theorising of politics and policy making. It will provide you with a foundation to understand the people, systems and structures that influence how our government works. Understanding political dynamics and how good policy-making happens helps prepare students to work in government agencies, or to work more effectively in non-governmental roles concerning law and justice. In addition to providing a conceptual overview of the structures and functions of government, this unit introduces students to the practical elements of policy-making enabling you to develop basic political communication skills.

View unit details online | View unit timetable

JSB261 Theories of Government

Pre-requisites	96 Credit Points of Completed Study
Credit Points	12

You cannot fully understand our system of government without understanding the history of the theories that have led to this point. This is core knowledge for working in policy or politics. This unit will run through all the major theories of how governments should operate and the basis of authority, legitimacy and freedom. JSB261 Theory of Government will provide you with the necessary knowledge of what our system of government is designed to do and why we have this rather than another system of government.

View unit details online | View unit timetable

JSB263 Global Political Institutions

Pre-requisites	96 Credit Points of Completed Study
Credit Points	12

Justice graduates are increasingly taking on key roles working in or alongside political institutions. It is essential that graduates have a full and working knowledge of the structure and process of international governance in order to excel in these roles in an increasingly professionalised and globalised public sector. This unit will explore the establishment, evolution and functioning of key international and Australian political institutions, in order to increase students' understanding and awareness of our systems of governance.

View unit details online | View unit timetable

JSB266 White Collar Crime and Official Corruption

Pre-requisites	JSB172 or JSB178 or LLB101
Anti-requisites	JSB183, JSB265
Credit Points	12

The study of public sector ethics covers the types of actions and the methods of enforcement required to bring about performance in the public interest. This unit will introduce you in detail to the most important issues of public sector ethics, both in Queensland and the world. As government employees, it is essential that you not only understand these concepts but put them into practice. White collar crime is becoming more common in Australian society. There are a larger number of people in a position to participate in white collar crime and new opportunities are presented by a more corporatised and technological society. Greater resources are being applied to detect these crimes within police services. The study you will undertake in this unit follows on from learning in JSB172 Professional Academic Skills or JSB178 Policy, Governance and Justice.

View unit details online | View unit timetable

JSB273 Justice Research Methods

Pre-requisites	JSB170 or JSB172 or JSB178 or LLB101 or PYB007
Credit Points	12

Research within criminology highlights that in order for students to undertake research themselves and be able to critically read and assess the research of others they need to have a clear understanding of the research methods commonly used in the field (Kleck et al., 2006). This unit is designed to provide students with essential knowledge and skills required to undertake justice research. At completion of this unit, you will: (a) be able to take these learned skills and apply them to your practice as a future justice professional, and (b) develop skills that can be used for further advanced study in both quantitative and qualitative research methods and analysis.

View unit details online | View unit timetable

JSB379 Political Practice, People Power, and Protest

Pre-requisites	96 Credit Points of Completed Study
Credit Points	12

There is increasing demand in Australia for graduates with the skills and expertise required to contribute to the policy-making process and delivery of democracy. It is therefore necessary for students who wish to work in the public sector or as part of the political process to understand the role of people power in political decision-making. This unit offers students an insight into global and national social movements, political lobbying, and political participation.

View unit details online | View unit timetable

JSB380 Critical Policy Analysis

Pre-requisites	JSB207 or JSB263
Credit Points	12

Critical policy analysis is an essential ability in the justice sector, and policies in this field have significant social consequences. It is imperative that those employed in areas connected to justice are equipped with the skills to critically interrogate policy evidence, impacts and implications. This unit will draw on important debates in contemporary policy (including Indigenous policy) to explore some important ways policy works - as a practical expression of government intentions, as a mechanism for social inclusion and exclusion, and as an expression of social and political relationships. This unit provides the opportunity for you to draw together the knowledge and skills you have developed in this area, and build on them, in order to hone and practice these capabilities.

View unit details online | View unit timetable

KKB190 Yatdjuligin - Cultural Safety in Indigenous Australian Context

Equivalents	OUB100
Credit Points	12

Culturally Safe practice is an essential element in a professional's ability to work in a holistic and accountable way with Indigenous Australian peoples and their communities. This requires deconstruction of your own cultures, values, beliefs and attitudes by taking you on a learning journey that allows you to move beyond cultural awareness and cultural sensitivity through to cultural safety.This unit will prompt you to develop your own strategies to be a culturally safe practitioner in both innovative and creative ways.

View unit details online | View unit timetable

KKB193 Indigenous Knowledge: Research Ethics and Protocols

Equivalents	OUB130, EDB040
Credit Points	12

This unit critically analyses and articulates culturally safe research that reflects decolonising methodologies as an underpinning framework for research regarding Indigenous Australian issues. The need for culturally safe research is

supported by the obvious gaps in knowledge of the ongoing life-differentials and social determinants that impact on Indigenous Australians. Interrogation of Western research and Indigenous scholarship spanning international contexts will challenge you to critically analyse and deconstruct previously held perceptions of research conduct. Indigenous knowledges and pedagogies will facilitate a transformative learning journey in a process where students critique Western research frameworks that continue to represent the Indigenous peoples as the 'other'. The unit will engage your learning through Indigenous knowledge frameworks that facilitate the development of a decolonising research proposal which adheres to Indigenous research ethics and protocols.

View unit details online | View unit timetable

LQB180 Foundations of Biochemistry

Anti-requisites	CVB102 and CZB190
Credit Points	12

As part of your foundational level studies and training in disciplines related to biomedical and health sciences, you need to develop knowledge and comprehension of biochemistry in order to describe and explain the biomolecular composition of cells that constitute living systems, such as the human body, the structural nature of biomolecules, and the functions of biomolecules in essential life processes.

View unit details online | View unit timetable

LQB182 Cell and Molecular Biology

Equivalents	LQB186
Credit Points	12

Cell and molecular biology is an exciting, rapidly evolving, and major field in biomedical disciplines and this unit will expose you to modern examples of applications of cell and molecular biology in medical and research settings. There will be an emphasis on the development of practical skills and knowledge that will support your learning of fundamental concepts. A basic understanding of cell and molecular biology is required for further study in many areas, including the study of clinical sciences, biochemistry, and human physiology. Importantly, this unit will provide you with a strong foundation of knowledge regarding cells, their structures and functions that is applicable to many professional disciplines, including pharmacy, podiatry, optometry, nutrition and dietetics, business, law, humanities, and creative industries.

View unit details online | View unit timetable

LQB185 Anatomy and Physiology for Health Professionals

Equivalents	LSB182, LSB142, LQD185
Credit Points	12

This introductory unit explores the structure (anatomy) and functions (physiology) of the human body, by providing students with opportunities to investigate the major organ systems necessary for life. A focus on medical language development will underpin the learning in this unit, where students will develop the ability to effectively communicate anatomy and physiology concepts in health care environments. This first-year unit provides the foundational knowledge of organ function in health to prepare students for more advanced units-such as LQB285 Pathophysiology for Health Professionals, which covers the processes of diseases relevant to the Australian National Health Priority Areas-and students' development as health professionals.

View unit details online | View unit timetable

LQB362 Principles and Practice of Infectious Diseases

Pre-requisites	LQB281 or LQB292 or BVB101
Credit Points	12

Medical microbiology involves research into human infectious diseases from multiple viewpoints including: spectrum of disease, diagnosis, aetiology, treatment, prevention, control and epidemiology. An integral part of the practice of medical microbiology is the laboratory processing of specimens derived from patients with infectious diseases. Ultimately, you will need to have both a comprehensive and in-depth knowledge and understanding of theoretical concepts in infectious disease microbiology and be able to apply that knowledge and understanding safely, competently and skilfully in a PC2 diagnostic laboratory context.

View unit details online | View unit timetable

LQB381 Biochemistry

Pre-requisites	LQB180 or CZB190 or CSB432 or (CVB101 and CVB102)
Credit Points	12

The study of biochemistry provides you with the knowledge to fully appreciate the structure and function of biological macromolecules and their roles within living cells. You will acquire an appreciation on how these processes impact the cellular function and metabolism of the cells and tissues of the human body and how this may impact health and disease. This unit builds on the chemistry and biology elements of first year units and prepares you with a broad foundational knowledge for the study of biochemistry and allied disciplines of biomedical and health sciences.

View unit details online | View unit timetable

LQB382 Developmental Anatomy and Tissue Adaptation

Pre-requisites	LQB183 or LSB255 or LQB185 or LSB131
Credit Points	12

The human body is very responsive to its environment, both in terms of genetic cues during embryological development and hormonal and mechanical signals during post-natal ageing. This unit will explore a number of key embryological processes where tissue patterning results in the formation of the nervous, muscular, skeletal and cardiovascular organ systems, and provides the foundational understanding of the mechanisms responsible for anatomical variation in the human body. Furthermore the ability of tissues to adapt to their environment will be discussed by building understanding of tissue biomechanics and the effects of trauma and ageing on the human body; where you will have the opportunity to design,

implement and analyse experimental data in a bone strength research project. This developmental unit builds on foundational knowledge gained in first year anatomy and provides keystone knowledge and skills to advance into further units in Anatomical Sciences.

View unit details online | View unit timetable

LQB385 Molecular Biology and Bioinformatics

Pre-requisites	LQB182 or LQB186 or BVB101
Credit Points	12

The human genome shapes who we are. In this unit, we will learn how, why, when and where genes are expressed. We will also learn about the importance of regions in our genome that do not encode genes and what the consequences are of genetic variation and mutations, which may cause genetic diseases. An important part of the unit is the hands-on development of molecular biology skills in the laboratory and bioinformatics skills on the computer. We will extract, amplify, sequence and clone DNA. We will also use the Nobel prize-winning technology CRISPR, a gene-editing tool that has shown early successes in the treatment of patients by correcting genetic defects. Finally, we will use bioinformatics approaches to analyse DNA, RNA and amino acid sequences, including in the context of disease, and learn data analytics approaches, which are invaluable in the current era of big data and precision medicine.

View unit details online | View unit timetable

LQB388 Medical Physiology 1

Pre-requisites	LSB258 or LSB111 or LSB131 or LSB142 or LSB255 or LQB185
Credit Points	12

An appreciation of how the human body works is an important prerequisite to understanding the basis of health, disease, diagnostic technologies and treatment strategies. This unit deals specifically with the physiological systems that are responsible for the maintenance of health in humans. It therefore provides a useful frame of reference for students enrolled in biomedical science, nutrition science, nutrition and dietetics, exercise science, medical engineering or any of the biological sciences. In the course of the semester you will investigate half the systems that constitute the human body with the remainder dealt with in the second semester unit Medical Physiology 2 (LQB488).

View unit details online | View unit timetable

LQB450 Foundations of Pharmacology

Pre-requisites	LSB111 or LQB281 or LSB110 or LSB250 or LSB231 or LSB258
Credit Points	12

An understanding of how medicines work forms the basis of recognising clinical effects and adverse reactions. All members of the community have a responsibility in understanding drug action as consumers and health professionals. The work of health professionals is variable but may include communicating with consumers about their medicines, monitoring subjects, accurately reading and interpreting medical charts, checking doses, administering medicines, and monitoring for effects such as adverse drug reactions. They need confidence in these areas in order to have discussions with their patients and other health professionals, especially prescribers. This unit provides the principles of pharmacology which will prepare you for your role as a health care professional, medical scientist and/or consumer in administering and monitoring medicine use to improve health outcomes for Australians in accord with quality use of medicines.

View unit details online | View unit timetable

LQB482 Anatomical Imaging

Pre-requisites	LQB183 or LSB131 or LSB255 or LSB182 or LQB185
Credit Points	12

In order to recognise human pathology in a clinical setting, an understanding of the anatomical presentation of organs in health is essential. This unit focuses on the acquisition and application of knowledge of the organ systems of the thorax, abdomen, head and select regions of the limbs to a medical imaging context. Imaging modalities in plain and contrast radiography, computed tomography and magnetic resonance imaging will be explored to understand the context of their application in the clinical setting. Furthermore an understanding of typical patterns of anatomical variation will be examined through case studies and exploration of human donor material, where you will further develop effective teamwork and self-management skills, essential attributes of clinicians and biomedical scientists. This unit will build on your knowledge gained in first level anatomy and provide relevant knowledge and skills for more advanced studies in Anatomical Sciences.

View unit details online | View unit timetable

LQB485 Cell Biology

Pre-requisites	LQB385
Equivalents	LQB584
Credit Points	12

Understanding the role of cells and how their cellular components are fundamental to a healthy life is crucial for your understanding of how they become disregulated in disease and how individual components might be targeted to treat diseases. This unit builds on your knowledge of cellular components to examine how these come together structurally and functionally to build cells and tissues that function as part of a whole organism capable of surviving and protecting itself from disease and trauma. It will provide a platform for students undertaking the final year cell and molecular biotechnology units. This unit will provide hands on laboratory experience working with cells and will enhance skills in assessing, summarising and placing biomedical research in the context of health and disease.

View unit details online | View unit timetable

LQB488 Medical Physiology 2

Pre-requisites	LQB388
Credit Points	12

An appreciation of how the human body works is an important prerequisite to understanding the basis of health, disease, diagnostic technologies and treatment strategies. This unit deals specifically with the physiological systems that are responsible for the maintenance of health in humans. It therefore provides a useful frame of reference for students enrolled in biomedical

science, nutrition and dietetics, exercise science, medical engineering or any of the biological sciences. In the course of the semester you will investigate half the systems that constitute the human body with the remainder dealt with in the first semester unit Medical Physiology 1 (LQB388).

View unit details online | View unit timetable

LQB494 Pathogen Biology and Pathogenesis

Pre-requisites	LQB362
Credit Points	12

This unit is designed for students in biomedical sciences, to provide a strong grounding in microbiology and to contribute to the knowledge base of fundamental microbial processes that underpin the pathogenic potential of select species. This unit is a core unit in the infection and immunity strand, building on concepts introduced in Principles and Practice of Infectious Diseases (LQB362). Pathogen Biology and Pathogenesis (LQB494) continues the study of the host-microbe interaction with a focus on microbe-specific factors underpinning infectious disease progression, which is essential for future studies of more complicated or detailed molecular microbiology analyses. You will develop industry-relevant skills and use cutting-edge technology in laboratory classes, which will prepare you for a career in biomedical research, medical biotechnology and postgraduate studies in biomedical science.

View unit details online | View unit timetable

LQB681 Biomolecular Research Skills

Pre-requisites	LQB381 and LQB481
Equivalents	LSB607
Credit Points	12

While technical expertise is important for a successful career in biomedical science, high level interpersonal skills, such as effective communication, critical thinking, problem-solving and working effectively in a team are also valued highly by potential employers and research project leaders. This unit offers opportunities for you to independently design and work on a research project throughout the semester, which will assist you in developing both biomolecular research and interpersonal skills. This unit is a capstone biochemistry unit designed to prepare you as a prospective graduate for independent and team-based research.

View unit details online | View unit timetable

LSB111 Understanding Disease Concepts

Credit Points	12

This unit reinforces fundamental assumed knowledge of anatomy and physiology and introduces the study of human disease processes or pathophysiology. General concepts underlying human diseases as well as disorders relating to organ systems will be studied and the major diseases affecting Australians, in particular those identified as contributing significantly to disability and death in Australia by the National Health Priority Areas, will be addressed. The ability to understand and interpret the pathophysiology underpinning clinical contexts and to communicate this information using appropriate medical terminology are essential requirements for all students undertaking allied health courses and prepares them for professional practice.

View unit details online | View unit timetable

LSB142 Human Anatomy and Physiology

Credit Points	12

A strong background in human body structure (anatomy) and function (physiology) is essential for students in professional health courses. In this introductory unit you will be provided with opportunities to investigate both theoretical and practical aspects of gross, systematic and microscopic anatomy. You will also review general physiological principles such as homeostasis and investigate how all the organ systems of the body contribute to it. Knowledge and practical skills acquired in this foundational unit will allow you to engage with more advanced studies in regional anatomy, pathophysiology and imaging diagnostics.

View unit details online | View unit timetable

MGB200 Managing People

Equivalents	MGX200
Credit Points	12

Everyone in business, government and non-for-profit organisations works with other people, and organisational behaviour provides the knowledge and tools to interact with others effectively. No matter what career path you choose, you'll find that organisational behaviour concepts play an important part in performing your job and working more effectively within organisations. In this unit we will examine how individual differences impact upon what people think, feel, and do in the workplace, and how this understanding of people can help us build more fulfilling and successful workplaces. We focus on getting the best out of people at work, including ourselves, by promoting the sustainable and ethical integration of the business needs and the individual's needs. Not only is an understanding of human behaviour and organisations fascinating, it is also necessary to succeed in today's fast-paced environment, as it can help improve organisational, managerial and personal effectiveness.

View unit details online | View unit timetable

MGB225 Intercultural Communication and Negotiation Skills

Pre-requisites	48 credit points of completed studies
Equivalents	MGX225
Credit Points	12

Understanding and managing the ways culture impacts communication within a culturally diverse workforce and negotiation in a multi-cultural environment is essential for business professionals operating in national and international contexts. By understanding cultural influences, managers can then modify their communication style to communicate and negotiate effectively with culturally diverse colleagues, competitors and clients. The aim of this unit is to provide students with key knowledge and a range of practical skills in interpersonal and corporate communication and negotiation across various business contexts with particular emphasis on the influence of culture on communication and negotiation. This unit is fundamental to management and builds on prior core learning

in management, people and organisations to provide conceptual frameworks and interpersonal skills to enhance organisational and management capabilities at local, national and international business levels.

View unit details online | View unit timetable

MGB226 Innovation, Knowledge and Creativity

Pre-requisites	BSB105 or BSB115 or MGB200 or Completion of 96 Credit Points of Study
Anti-requisites	MGB355
Equivalents	MGX226
Credit Points	12

Innovation, knowledge and creativity are the key drivers of success for many of today's leading firms and are integral to an organisation's ability to survive and thrive in a competitive marketplace. This unit is based on the increasing emphasis on the role of innovation and knowledge within an organisation and how creativity and innovation can be facilitated and managed in a work setting. It also introduces you to the impact of innovation and knowledge in shaping the commercial and strategic agenda of the firm in the competitive environment. This unit will provide you with experiences that develop your knowledge of and skills in the processes involved in managing innovation from both macro and micro perspectives. You will study the meanings and role of creativity and knowledge and how they impact on managerial strategies and tactics for fostering innovation in organisations.

View unit details online | View unit timetable

MGB227 Entrepreneurship

Pre-requisites	BSB105 or BSB115 or Completion of 96 credit points of study
Anti-requisites	MGB223
Equivalents	MGX227
Credit Points	12

The ability to think and act entrepreneurially is increasingly important in modern society, regardless of future career aspirations. This action-oriented unit is designed specifically to enable students to walk in the shoes of an entrepreneur and to experience the excitement, challenge and unpredictable nature of identifying, developing and communicating new venture value creation strategies. Further, this unit provides students with the opportunity to develop potential solutions for real world problems, and to present those solutions to their peers. Students will be able to reconcile their actions and experience to various frameworks, like the Disciplined Entrepreneurship framework.

View unit details online | View unit timetable

MGB310 Managing Sustainable Change

Pre-requisites	MGB200 or BSB250
Equivalents	MGX310
Credit Points	12

Corporate sustainability has been widely acknowledged as fundamental to the performance and ongoing success of organisations. A sustainable organisation is recognised as one that manages its processes, products and people in an ecologically aware and socially responsible manner. Understanding the processes though which sustainability issues can be integrated into broader corporate strategy and practices is a key element for organisational success and the ability to plan and manage the change programs needed to make these shifts are integral management competencies. This unit focuses on key concepts and ideas of organisational sustainability including stakeholder engagement and the human dimensions of change. The unit will prepare you to make a significant contribution to the sustainable development of organisations and society through the development of your critical thinking and communication skills.

View unit details online | View unit timetable

MGB324 Managing Business Growth

Pre-requisites	MGB223 or MGB227
Equivalents	MGX324
Credit Points	12

This unit examines the venture growth processes for entrepreneurial managers. It focuses on the post start-up issues for the entrepreneurial venture and allows you to analyse exiting venture operations. The unit considers the rapid growth issues in business ventures and examines how to grow and manage in the post start-up phase. This unit is designed for those individuals interested in owning, or who currently own, their own venture and for those working in industries as employees or wishing to work in the growing organisations.

View unit details online | View unit timetable

MGB341 Managing Risk

Pre-requisites	MGB200 or MGB226
Credit Points	12

An understanding of risk management, in theory and practice, is essential for ensuring resilient and sustainable organisations. Effective risk management outcomes result from the analysis of uncertainties embedded in human knowledge, systems of management and processes in commerce, and from implementing mitigation strategies generated to address these factors. This unit seeks to introduce students to current Risk Management models and apply them in the context of current national and international risk standards.

View unit details online | View unit timetable

MXB100 Introductory Calculus and Algebra

Anti-requisites	MAB125,MZB125
Equivalents	MAB100,MAB120,MAB180
Credit Points	12

This unit builds on high school calculus by exploring derivatives, integrals and differential equations. It also introduces the basic theory of matrices, vectors and complex numbers. The ability to apply these concepts and techniques, and express real-world problems in mathematical language, is essential in quantitative fields such as science, business and technology. This is an introductory unit, which attempts to establish foundational skills that you will extend in subsequent discpine-specific units. This unit is particularly intended for students whose mathematics preparation does not include Queensland Senior Mathematics C

or an equivalent.

View unit details online | View unit timetable

MXB103 Introductory Computational Mathematics

Equivalents	MAB220
Credit Points	12

Many real world phenomena are modelled by mathematical models whose solutions cannot be found analytically. To solve these problems in practice, it is necessary to develop computational methods, algorithms and computer code. This unit will introduce you to numerical methods for addressing fundamental problems in computational mathematics such as solving nonlinear ordinary differential equations, finding roots of nonlinear functions, constructing interpolating polynomials of data sets, computing derivatives and integrals numerically and solving linear systems of equations. This is an introductory unit providing fundamental skills in computational mathematics and their practical implementation using relevant computational software. This unit will be essential throughout the remaining parts of your degree. MXB226 Computational Methods 1 builds on this unit by extending your computational and programming skills to more challenging problems and more sophisticated algorithms.

View unit details online | View unit timetable

MXB161 Computational Explorations

Pre-requisites	Admission to (MS01 or IX30 or SE20 or SE30 or SE40 or SE70 or ID28) or 48 credit points of study in current course
Credit Points	12

This unit introduces you to techniques of computation and simulation across a range of application areas in Science, Technology, Engineering and Mathematics (STEM). Computation and simulation are cornerstones of modern practice across STEM; practitioners skilled in these areas can explore behaviours of real-world systems that would be impractical or impossible to undertake using only theoretical or experimental means. In this introductory unit, you will develop your computation and simulation skills through individual and collaborative problem-solving activities. Further exploration is available through the faculty-wide second major or minor in Computational and Simulation Science.

View unit details online | View unit timetable

MXB261 Modelling and Simulation Science

Equivalents	INB360, MAB480
Credit Points	12

With the rapid development in both computing hardware and its application to advanced scientific problems that require computational solutions, there is a need for IT, Maths and Science students to have a practical understanding of Computational and Simulation Science. This unit aims to provide you with the knowledge to apply computational simulation techniques in a selection of application areas where the scientific problems are characterised by widely varying scales, both in space and time. You will use relevant programming softwares to develop and implement simulation algorithms together with analysis of resulting data using multi-dimensional visualisation techniques. You can further develop visualisation skills through units MXB262 Visualising Data and MXB362 Advanced Visualisation and Data Science, as well as extending your knowledge of computational science through the unit MXB361 Aspects of Computational Science.

View unit details online | View unit timetable

MXB262 Visualising Data

Pre-requisites	SEB113 or MXB107 or MXB161 or MXB261 or MZB126
Equivalents	MAB481
Credit Points	12

Our world has an unprecedented amount of available data - especially in STEM, where generating and working with data is core to our fields. The ability to visualise data is critical for exploring and communicating science and engineering findings. Modern visualisation theory and techniques allow us to efficiently explore and communicate with data. This unit introduces data visualisation concepts, theories, and techniques, along with practical experience exploring and dynamically visualising complex data. You will develop an understanding of the fundamental concepts in data visualisation through practical, real-world examples in contexts such as the environment, agriculture, industry, engineering, and healthcare. You will follow the visualisation pipeline from importing, to visualising, to communicating data. We focus on effective visual communication and high-quality, fit-for-purpose representations of 2D, multi-dimensional, network, and spatial data.

View unit details online | View unit timetable

MXB361 Aspects of Computational Science

Pre-requisites	MXB261 or MXB262
Credit Points	12

With the rapid development in computing hardware, algorithms, AI and their applications to advanced scientific problems that require computational solutions, there is a need for IT, Maths, Science and Engineering students to have a practical understanding of Computational Science. This unit aims to provide you with the knowledge to apply computational techniques for problem-solving in a variety of application areas you are likely to encounter in your early careers, whether in industry or in further study. This unit will equip you with an understanding of different application areas requiring modern computational solutions, particularly as they relate to complex systems; you will have the opportunity to implement such computational techniques and analyse and interpret the resulting data.

View unit details online | View unit timetable

MXB362 Advanced Visualisation and Data Science

Pre-requisites	MXB262
Equivalents	MAB681
Credit Points	12

Data visualisation is an essential element of modern

computational and data science. It provides powerful tools for investigating, understanding, and communicating the large amounts of data that can be generated by computational simulations, scientific instruments, remote sensing, or the Internet of Things. The aim of this unit is to explore the issues, theories, and techniques of advanced data visualisation. This unit develops theoretical and practical understandings of the major directions and issues that confront the field. A selected number of advanced data visualisation techniques will be examined in detail through specific examples. The practicals will reinforce lecture content and extend your applied skills and knowledge in data visualisation, including specific methods. A focus of the unit is the development of real world data visualisation skills and experience, based on a major data visualisation case study.

View unit details online | View unit timetable

MZB101 Modelling with Introductory Calculus

Equivalents	MAB105
Credit Points	12

This is an introductory unit covering the basic mathematical theory of functions and graphs, along with the foundational concepts and techniques of differential and integral calculus. The unit also explores a wide variety of calculus applications, and introduces the basic mathematical modeling skills relevant to a wide variety of scientific fields. The ability to express scientific problems in mathematical language, and to apply calculus techniques in the analysis of these problems, is essential to science students across all discplines. This introductory unit is particularly intended for students whose mathematical preparation does not include Queensland Senior Mathematics B or an equivalent. The mathematical foundation covered here will be developed further in SEB113.

View unit details online | View unit timetable

MZB125 Introductory Engineering Mathematics

Anti-requisites	EGD125, MXB100
Equivalents	MAB125, MAB100, MAB120
Credit Points	12

This unit provides an introduction to foundational mathematical concepts that enable mathematical and numerical problem solving in engineering disciplines. It prepares engineering students for their transition from high school to university, particularly those who have not studied Queensland Specialist Mathematics (formerly called Senior Mathematics C) or equivalent. Major topics covered are elementary functions, their derivatives and integrals, the algebra of complex numbers, vectors and matrices, and an introduction to programming using relevant software. Mathematical techniques and problem solving skills are employed in a range of mathematical exercises and contextualised problems, illustrating how these concepts and techniques are used in real-world engineering systems.

View unit details online | View unit timetable

PCB593 Digital Image Processing

Credit Points	12

This unit provides students in the Astrophysics minor with an opportunity to learn how to use image processing techniques. An understanding of digital image processing enables information to be extracted from images that is not otherwise accessible. This unit delivers an understanding of digital images and the skills required to manipulate images in order to enhance features and extract quantitative information. Specific areas of study include the structure of digital images; image display techniques; grey scale palettes and look-up tables; colour perception, colour models, image formats, Fourier transforms; convolutions; image processing hardware; image analysis, enhancement and restoration; spatial filtering; Fourier space filtering; methods of image reconstruction; 3D volume and surface rendering; applications of image processing in medicine, astronomy and remote sensing.

View unit details online | View unit timetable

PQB360 Global Energy Balance and Climate Change

Equivalents	PCB563
Credit Points	12

This unit is designed to offer science, engineering and other students an opportunity to understand global energy balance and climate change and its relationship to the environment and the expanding field of alternative energy technologies. It also provides students opportunities to explore global energy balance and climate change through an investigation of (i) Energy related environmental problems on local and global scale particularly the effect of atmospheric pollution from combustion of fossil fuels; (ii) Earth's climate, meteorology and transport of pollutants in the atmosphere; (iii) Working principles in selected conventional and alternative energy technologies to reduce energy related environmental consequences.

View unit details online | View unit timetable

PUB209 Health, Culture and Society

Equivalents	NSB017
Credit Points	12

In this unit we study social and cultural dimensions of the human body, mind, and health. The unit focuses on public health from sociological and anthropological perspectives, with a core emphasis on the ways in which social, cultural, political, and economic systems shape human health behaviours and outcomes. We examine the practical relevance of key social theories in relation to understanding complex phenomena, such as cultural safety, risk-taking behaviours, life-expectancies, and death. We examine links between ethnicity, class, gender, sexuality, geography, and health. The fundamental message is that identifying and addressing social and cultural factors that shape people's experiences of health, illness and health systems is integral to reducing health inequalities, delivering appropriate services and ultimately improving population health outcomes.This is a multidisciplinary and interprofessional unit and welcomes students from a wide range of range of courses.

View unit details online | View unit timetable

PUB215 Public Health Practice

Credit Points	12

This introductory unit provides you with foundation knowledge and skills about Public Health principles, scope and practice.

You will gain an insight into a range of multidisciplinary approaches which are necessary in addressing the health needs of communities and populations. The unit also provides you with an overview of the conceptual framework that underpins the Bachelor of Public Health (PU52) and its associated double degrees. You will get an understanding of how the core public health skills and principles are linked throughout the course. The other core units you do as part of the Bachelor of Public Health will build on the knowledge and skills gained in this introductory unit.

View unit details online | View unit timetable

PUB326 Introduction to Epidemiology

Anti-requisites	HLN710
Credit Points	12

The skills gained in this unit will help you to critically read and evaluate the health literature, develop your assessment and analysis skills and critically appraise health evidence - skills broadly applicable to all the areas of public health in which you might work, and a stepping stone to your further studies in PUB416 Research Methods. By applying the concepts learned in this unit to current public health problems and issues, students will contextualise the practice of epidemiology as it relates to real life and recognise its role in informing health promotion initiatives, public health programs and policies.PUB326 is a key core unit for the Bachelor of Public Health (PU52) and its associated double degrees. Building on your study of the Year 1 core units, PUB326 continues to develop your understanding of the conceptual framework underpinning PU52, and with PUB561 builds core skills in quantitative evidence and a critical understanding of epidemiological measures.

View unit details online | View unit timetable

PUB332 Sustainable Environments for Health

Anti-requisites	PUB107
Credit Points	12

There is increasing evidence that the integrity of the environments in which we live are under substantial pressure, particularly from the way we live. The end result of such pressure is that the basic and fundamental pre-requisites for human health are threatened. The practice of Environmental Health has always been concerned with the study of the human - environment interface and in particular the quest for developing sustainable environments for health. In recognition of the multi-disciplinary effort required to maintain and sustain such environments, this Unit is relevant to many discipline areas (e.g. public health, environmental science, education, social science, engineering and planning) and provides a valuable insight into the contributions that each discipline can make to establishing sustainable environments for health.

View unit details online | View unit timetable

PUB406 Health Promotion Practice

Pre-requisites	PUB215 or PUB530 or PUB251
Credit Points	12

This unit extends the fundamental health promotion knowledge learnt in PUB215 Public Health Practice, and PUB530, Health Education and Behaviour Change to enable the translation of knowledge into practice. The range of health promotion strategies available to practitioners working in health related fields, relative strengths and weaknesses for addressing specific health problems and practical considerations for effective implementation in contemporary health promotion practice provide an essential field of study for those who wish to work in a health promotion or related field. PUB406 provides essential learning for PUB875 Professional Practice.

View unit details online | View unit timetable

PUB461 Qualitative Inquiry in Public Health

Credit Points	12

Qualitative methods enable researchers to gain knowledge and understanding of people's lived experiences, the meanings they ascribe to them, and to the social context in which they take place. The nature and complexity of many public health problems require a mix of research methods and the contributions of qualitative inquiry are now well recognised. This unit is an integral component of the public health course because you will learn the skills and knowledge required to appreciate and apply qualitative research in your professional practice. This unit is placed at this point in the course because you acquired in PUB215 a sound knowledge and understanding of the fundamental and complex public health concepts so can now develop specific research knowledge and skills. PUB461 belongs to the suite of four research units available in PU52 and associated degrees.

View unit details online | View unit timetable

PUB545 Health Policy, Planning and Advocacy

Pre-requisites	Completion of 192cp
Anti-requisites	PUB511
Credit Points	12

Health policy, planning and advocacy are important processes that ensure health care systems are responsive to the changing burden of disease in communities. In preparation for a professional career in health, this unit consolidates knowledge of health policy formulation, planning, implementation, evaluation and advocacy. Contemporary Australian health policy challenges will be examined at local, state and national levels. The dynamic nature of the health sector requires professionals to be proficient in translating health policy into practice. This unit builds on your previous studies on contemporary public health practice and health culture and society. You will develop knowledge and skills in health policy development, analysis, planning and evaluation, and develop an understanding of the role and influence of advocacy on policy making.

View unit details online | View unit timetable

PVB101 Physics of the Very Large

Anti-requisites	EGB113, ENB130, PCB150
Credit Points	12

The fundamental concepts of physics seek to describe, predict and explain phenomena at all scales from the observable universe down to subatomic particles. They underpin all the sciences. This unit introduces you to those underlying physical processes that relate to the behaviour of the macroscopic world we observe in our daily lives: motion, forces, energy, gravity

–and not so familiar- special relativity, and see how they help us to also understand thermal interactions, fluid dynamics, global warming, optical instruments, space travel, the motions of the planets and to theorise about the nature, history and future of the universe itself. You will learn how to think about scientific concepts, and solve problems like a physicist. These theoretical concepts are grounded in experimental verification, and you will develop technical and reporting skills in laboratory experiments which investigate the relationships between measurable physical phenomena both individually and in teams.

View unit details online | View unit timetable

PVB102 Physics of the Very Small

Credit Points	12

The fundamental concepts of physics seek to describe, predict and explain phenomena at all scales from the observable universe down to subatomic particles. They underpin all the sciences. This unit introduces you to those underlying physical processes that relate to the behaviour of the microscopic world. By observing the behaviour of waves, electric and magnetic fields, we have come to a deeper understanding of the nature of sound and light, and found experimental evidence for the structure of atoms and their nuclei, eventually leading to the Standard Model of particle physics. These are the principles at the heart of developing new materials and technology. You will learn how to think about scientific concepts and solve problems like a physicist, and critically apply what you have learnt to practical exercises in laboratories progressively developing both your experimental and scientific report writing skills that will provide the foundation for all future studies in science.

View unit details online | View unit timetable

PVB200 Computational and Mathematical Physics

Pre-requisites	MXB100 or MZB125
Anti-requisites	MXB105
Credit Points	12

This is a foundational physics unit designing to provide strong mathematical knowledge and skills required by a physicist and demonstrate the application of computational methods to solve problems in physics. It builds on prior maths study in Maths C or equivalent and teaches tactics in MATLAB programming, numerical methods and the implementation. The strong computational skills are important attributes of any physicist, whether working in research or industry, experimental or theoretical. This is an introductory unit and the knowledge and skills developed in this unit are relevant to physics, chemistry or some engineering majors. PVB302 Classical and Quantum Physics needs the mathematical knowledge and computational skills from this unit to understand the complex quantum world.

View unit details online | View unit timetable

PVB202 Mathematical Methods in Physics

Pre-requisites	(PVB101 or EGB113) and (MXB100 or MZB125)
Credit Points	12

Strong mathematical skills are important attributes of any physicist, whether working in research or industry, experimental or theoretical. This unit is designed to provide the key mathematical methods to solve physical problems. It builds on MXB100 and first year.

View unit details online | View unit timetable

PVB203 Experimental Physics

Pre-requisites	PVB101 or EGB113
Equivalents	PQB451
Credit Points	12

This unit aims to develop your skills in experimental methods, from the design and execution of your work to data treatment, fitting, and statistical analysis of errors.It provides you with an opportunity to build, practice and provide evidence of your analysis and problem-solving skills for physics, as well as to build your scientific report writing skills and presentation of results. It also provides you with a working knowledge of instrument design and the principles of circuit theory and electronics that underlie instrumentation. This unit is in the developmental stage of your course and builds on the work of previous experimental units. This unit also links to further self-managed experimental and project work in your final year.

View unit details online | View unit timetable

PVB204 Electromagnetism

Pre-requisites	(PVB202 or PVB200 or MXB106) and (MXB100 or MZB125)
Credit Points	12

Electromagnetism is one of the fundamental forces in the universe and is present in almost all aspects of modern technology. In this unit you will develop theoretical knowledge and understanding of electromagnetism from electric charge to more advanced topics such as electrostatics, Maxwell's equations, electromagnetic waves and applications such as waveguides. It will extend your mathematical knowledge and techniques from earlier units to explore and analyse these advanced physics concepts.

View unit details online | View unit timetable

PVB210 Stellar Astrophysics

Equivalents	PQB460
Credit Points	12

Astrophysics is the application of physics to the study of the heavens from above the atmosphere to the furthest reaches of the universe. This unit is one of the units in the astrophysics minor and covers the essential aspects of stellar astrophysics and naturally follows on from PVB101, The physics of the very large. The unit covers the birth, life, death of stars and is a mix of theory and laboratory exercises. The laboratory exercises cover astrophysical topics relevant to everyday physics.

View unit details online | View unit timetable

PVB220 Cosmology

Equivalents	PQB660
Credit Points	12

Cosmology is the study of the origin and evolution of the universe, from the Big Bang to the present. Topics presented include special and general relativity, the physics and geometry of space-time, inflationary cosmology, cosmic microwave background, dark energy and dark matter, supermassive black holes, gravitational waves, and the status of Australian cosmology surveys.

View unit details online | View unit timetable

PVB301 Materials and Thermal Physics

Pre-requisites	PVB200 or MXB105 or PVB202
Credit Points	12

The aim of this unit is to introduce you and to the physical principles that describe the behaviour of solids and fluids at both the macroscopic level and at the atomic level. This is an advanced unit that builds upon conceptual physical and mathematical principles of earlier units. Through lectures, practical classes and simulations the unit will provide you with strong foundation in thermodynamics and statistical mechanics. You will gain knowledge in the fast growing area of solid state physics and learn some of the techniques used to study new materials. The development of new materials is pivotal for the technology advancements of our society, with outcomes in every aspect of human life, spanning from reducing our environmental impact, to improving communication and computing, to achieving a better healthcare.

View unit details online | View unit timetable

PVB302 Classical and Quantum Physics

Pre-requisites	PVB200 or PVB202 or PVB204
Credit Points	12

Build on your prior learning in analytical mathematical approaches to solve problems in classical mechanics. Extend your understanding of classical mechanics through comparison of the Newtonian, Lagrangian and Hamilton's methods and their connection to quantum theory. Historical development of quantum theory will be traced, introducing key counter-intuitive concepts such as wave-particle duality, its connection to the theory's probabilistic nature and the uncertainty principle. This understanding of quantum concepts will be applied in terms of modern wave mechanics via solutions to the Schrodinger equation to explain a range of observed electronic behaviours such as quantum tunneling which is the operating mechanism of many semiconductor devices prevalent in technology today. The quantum approaches developed will also be applied to determine the appropriate description and arrangement of electrons bound to atoms and to explain the features of their emission and absorption spectra.

View unit details online | View unit timetable

PVB303 Nuclear and Particle Physics

Pre-requisites	PVB302
Credit Points	12

This unit explores the microscopic universe from the nucleus down to the fundamental particles and forces from which matter is built. It will examine the development and the modern state of models of the nucleus, drawing on Quantum Mechanics (PVB302) to explain the stability and the properties of nuclei. Some of the current theories of particle physics and nuclear forces will be introduced. The second part of the unit will explore applications of nuclear physics, e.g. nuclear reactions, nuclear power and nuclear medicine. Lectures will be complemented by experimental laboratory work, enabling you to advance your experimental, communication and scientific writing skills.

View unit details online | View unit timetable

SEB104 Grand Challenges in Science

Anti-requisites	SEB101, SEB102
Credit Points	12

Grand Challenges in Science explores world events, problems or phenomena from a scientific perspective, discovering the many ways in which science is used and misused by practicing scientists and the public. You will understand the problems and challenges of modern scientific inquiry using a range of multidisciplinary perspectives and explore solutions focussed approaches.

View unit details online | View unit timetable

SEB113 Quantitative Methods in Science

Anti-requisites	MAB101
Credit Points	12

SEB113 is a foundational science unit for developing core quantitative skills of analysis, modelling and simulation that underpins all modern scientific practice. These quantitative skills are taught in the scientific context using R, a popular open source computing software, to prepare students for the practical aspects of designing, conducting and analysing experimental and other scientific study. Tools for analysing scientific phenomena include differential and integral calculus, which can model change in system behaviour, and linear modelling and regression, to estimate models while accounting for uncertainty. Such concepts and techniques, in addition to software skills relating to data handling and visualisation, are central to the scientific study of real world biological, environmental, physical and chemical systems. This unit thus serves as a foundation and prerequisite for many subsequent units in the science degree.

View unit details online | View unit timetable

SEB115 Experimental Science 1

Anti-requisites	SEB114
Credit Points	12

Science is the systematic study of the structure and behaviour of the physical and natural world through observation and experiment. To this end scientists employ a unique methodology termed the Scientific Method. Experimental Science 1 applies the principles of the Scientific Method as it relates to experiments in the fields of Chemistry and Physics. You will conduct experimental science, via inquiry-led practice, working both individually and collaboratively. Through classroom activities, workshops and laboratory experiences, you will focus on real-world applications. Activities will include recording and interpreting experimental data, experimental data analysis and modelling using appropriate quantitative methods, and the presentation of findings in written and graphical form. Together with the SEB113 Quantitative Methods and SEB116 Experimental Science 2, this unit provides the fundamental skills

required for scientific research in any discipline.

View unit details online | View unit timetable

SEB116 Experimental Science 2

Anti-requisites	SEB114
Credit Points	12

Science is concerned with developing testable, quantifiable models of the world around us for the purpose of creating a sustainable, safe future for humankind. To this end, scientists employ a unique methodology termed the Scientific Method. “Experimental Science 2” focuses on the applied principles and concepts embodied by the Scientific Method as it relates to the fields of biological, environmental and earth science. You will conduct experimental science, via inquiry-led practice, working both individually and collaboratively. Through field and/or laboratory experiences, you will focus on real-world applications.

View unit details online | View unit timetable

SEB200 Communicating Science and Mathematics to Diverse Audiences

Credit Points	12

This unit is designed to optimise your communication skills, so that you gain a range of language tools to articulate research and convey complex scientific and mathematical ideas. You will learn how to engage different audiences and gain awareness of responsible communication in these areas.

View unit details online | View unit timetable

SEB300 Science and Mathematics Education Capstone

Pre-requisites	(CRB040 or EUB012) and SEB200 and (CRB215 or CRB204 or EUB221 or EUB224)
Credit Points	12

This unit provides more challenging opportunities for students to put into practice their learning on effective communication of scientific and mathematical concepts to different audiences. You will gain insights into how to gauge the audience's response to your teaching approach and how to redirect your teaching strategy as needed to improve learning outcomes. You will appreciate the many applications of good science and mathematics communication outside of teaching and will have opportunities to produce quality educational materials for different audiences that could be adopted for future use by the relevant organisation, business, educational body or research scientist. The unit is taken as the final unit in the science education minor.

View unit details online | View unit timetable

SEB701 Work Integrated Learning 1

Equivalents	BEB701
Credit Points	12

This unit provides opportunities to learn from workplace experiences. It involves attendance, participation, observation, critical reflection, and report writing on workplace activities. The emphasis of your critical reflection and report writing will be on identifying and describing aspects of professional relevance incorporating: collaboration and teamwork; work place, health and safety; professional conduct; ethical responsibility; and other aspects of your work place experience. This unit may form part of your (compulsory) course core (as required by professional accrediting bodies e.g. Engineers Australia) or it may be one of several Work Integrated Learning (WIL) units (selected as part of a minor).

View unit details online | View unit timetable