How to complete a major in Chemistry

THE UNIVERSITY OF MELBOURNE

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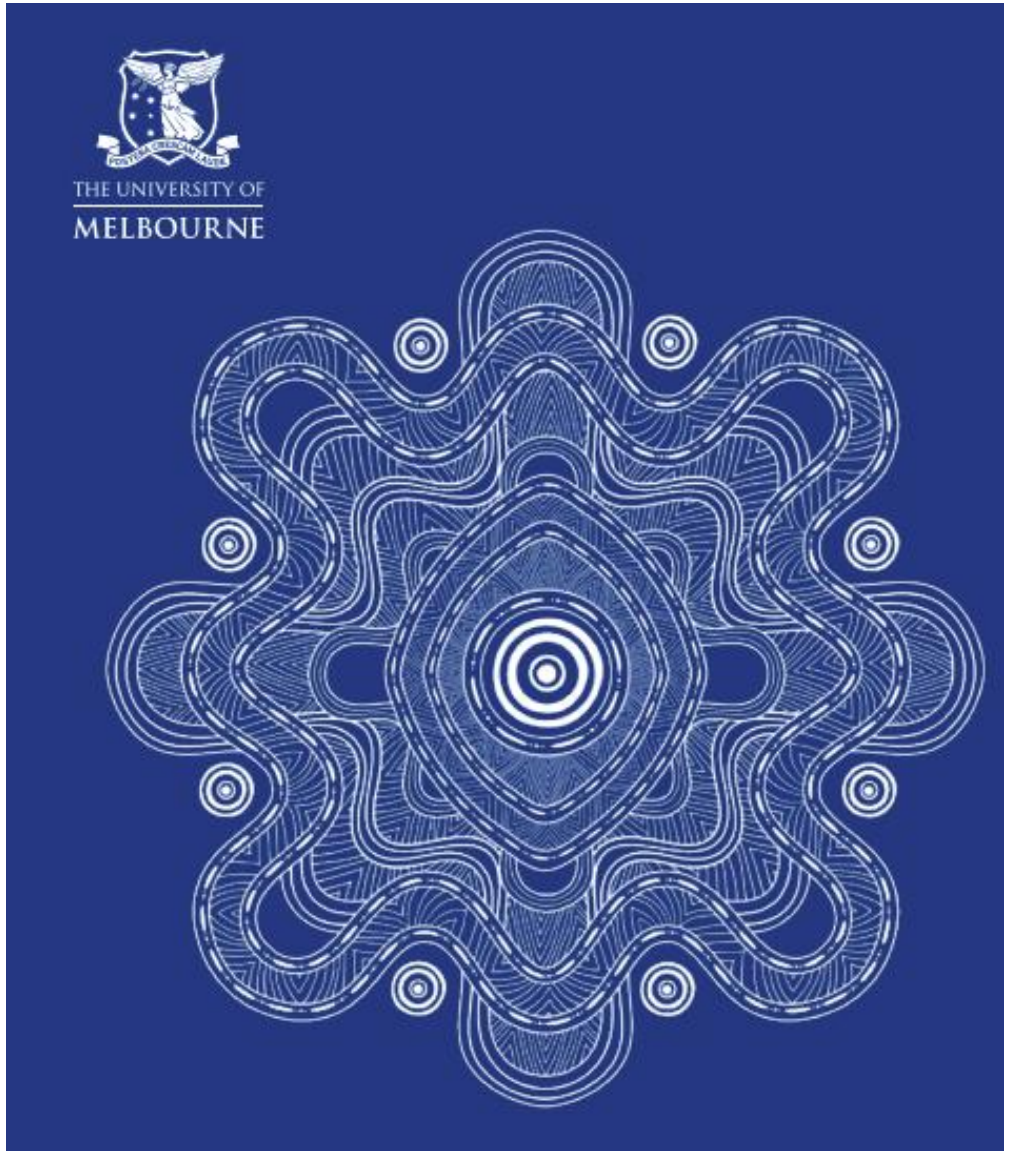
Acknowledgement of Country



I would like to acknowledge and pay my respects to the traditional owners of this unceded land on which we work, learn and live.

I would also like to pay my respect to the Elders, past, present and emerging.

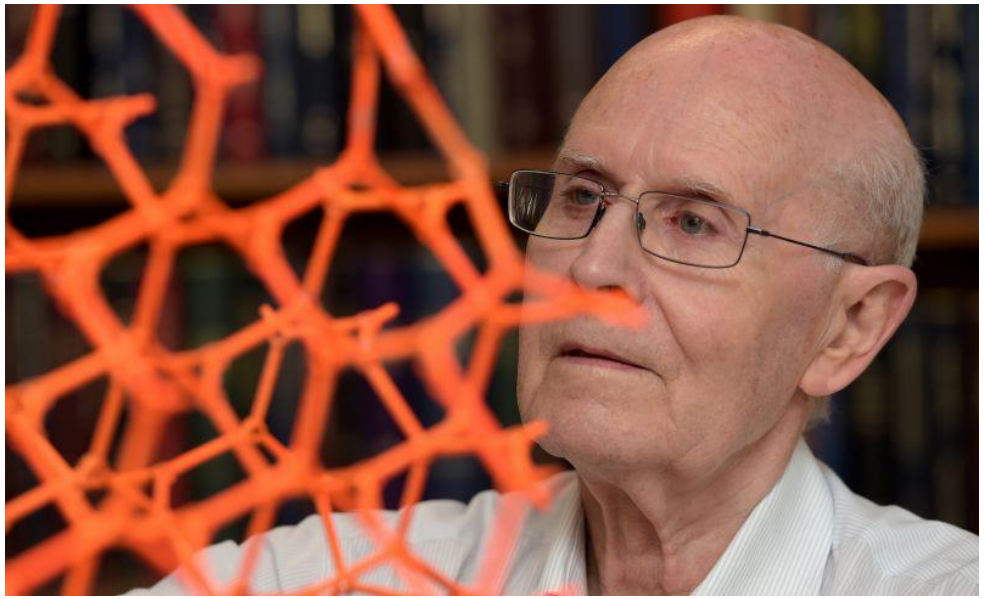
I also recognise the ongoing contribution of the Aboriginal and Torres Strait Islander peoples to acknowledge, teaching, and research in the sciences

Welcome

Head of School:
Professor Uta Wille

Deputy Head of School
Professor Megan Maher

NOBEL PRIZE WINNER!!!



Professor Richard Robson

2025 Nobel Prize in Chemistry.

- Development of metal-organic frameworks.
- Richard invented metal ligand networks, and in doing so, he laid the groundwork for an entire field of chemistry.
- His pioneering work has revolutionised the way chemistry is done in industry and in academic settings across the globe.
- The Nobel Prize is a testament to Richard's quiet dedication, perseverance and endless curiosity.
- His work has left an indelible mark on the field of chemistry and broader science community, and his legacy will continue to inspire generations of scientists to come.

Chemistry:
The Central Science

Biology
Microbiology
Physiology
Genetics

Biochemistry
Molecular
Immunology
Endocrinology

Physics
Atomic
Nuclear
spectroscopy

Geology

CHEMISTRY

Environmental Science
Ecology
Pollution

Astronomy

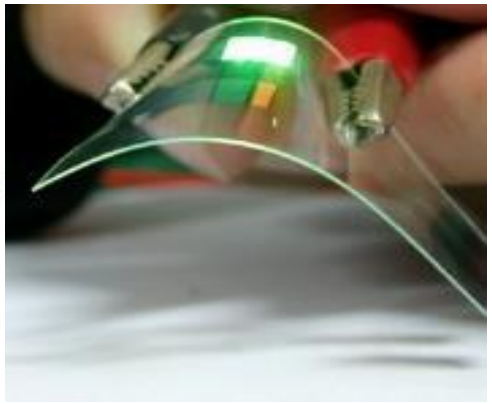
Medicine
Pharmacology
Clinical Medicine
Nutrition

Plant Science
Botany
Agriculture

Why is chemistry important?

What is chemistry all about?

- The better question is, what isn't chemistry all about?
- Whether it's harnessing renewable energy sources, next-gen nanotechnology, or new medical breakthroughs, chemistry is an ever-present and vital tool for shaping the technologies of tomorrow.



Major in Chemistry (BSc) Required Subjects

Subject Code	Subject Name	Semester	Prerequisites
First-Year			
CHEM10003	Chemistry 1	1 or 2	VCE 3/4 or equivalent
CHEM10004	Chemistry 2	2 or Sum	CHEM10003 or equivalent
Second-Year			
CHEM20018	Reactions and Synthesis (Coursework)	1	CHEM10004 or CHEM10006
CHEM20020	Structures and Properties (Coursework)	2	CHEM10004 or CHEM10006
CHEM20019	Practical Chemistry 2 (Practical)	2	CHEM20018 or CHEM20020
Third-Year			
CHEM30016	Reactivity and Mechanism (Coursework)	1	CHEM20018 and CHEM20020
CHEM30015	Advanced Practical Chemistry (Practical)	1	CHEM20019 and CHEM30016 (CHEM30016 can be taken concurrently)
Plus two of:			
CHEM30017	Specialised Topics in Chemistry A (Coursework)	2	CHEM20018 and CHEM20020 or CHEM30016 (CHEM30016 can be take concurrently)
CHEM30014	Specialised Topics in Chemistry B (Coursework)	1	CHEM30016
CHEM30012	Analytical and Environmental Chemistry	2	CHEM20011 or CHEM20019

Major in Chemistry (BSc)

First-Year	**Semester 1**	**CHEM10003** Chemistry 1		SCIE10005 Today's Science, Tomorrow's World	Breadth
	Semester 2	**CHEM10004** Chemistry 2			Breadth
Second-Year	**Semester 1**	**CHEM20018** Reactions and Synthesis	Science Elective Or Chemistry Elective	Science Elective Or Chemistry Elective	Breadth
	Semester 2	**CHEM20020** Structures and Properties	**CHEM20019** Practical Chemistry 2	Science Elective	Breadth
Third-Year	**Semester 1**	**CHEM30016** Reactivity and Mechanism	**CHEM30015** Advanced Practical Chemistry	Chemistry Core Elective* OR Science Elective	Breadth Or Science/Chemistry elective
	Semester 2	Chemistry Core Elective*	Chemistry Core Elective*	Science Elective Or Chemistry Elective	Breadth Or Science/Chemistry elective

*2 of : CHEM30017 Specialised Topics in Chemistry A (S1)

CHEM30014 Specialised Topics in Chemistry B (S2)

CHEM30012 Analytical and Environmental Chemistry (S2)

Major in Chemistry BSc - Electives

First-Year	**Semester 1**	**CHEM10003** Chemistry 1		SCIE10005 Today's Science, Tomorrow's World	Breadth
	Semester 2	**CHEM10004** Chemistry 2			Breadth
Second-Year	**Semester 1**	**CHEM20018** Reactions and Synthesis	Science Elective Or Chemistry Elective	Science Elective Or Chemistry Elective	Breadth
	Semester 2	**CHEM20020** Structures and Properties	**CHEM20019** Practical Chemistry 2	Science Elective	Breadth
Third-Year	**Semester 1**	**CHEM30016** Reactivity and Mechanism	**CHEM30015** Advanced Practical Chemistry	Chemistry Core Elective* OR Science Elective	Breadth Or Science/Chemistry elective
	Semester 2	Chemistry Core Elective*	Chemistry Core Elective*	Science Elective Or Chemistry Elective	Breadth Or Science/Chemistry elective

*2 of : CHEM30017 Specialised Topics in Chemistry A (S1)

CHEM30014 Specialised Topics in Chemistry B (S2)

CHEM30012 Analytical and Environmental Chemistry (S2)

Major in Chemistry BSc - Electives

Subject Code	Subject Name	Semester	Prerequisites
Second Year Electives			
CHEM20026	Principles of Chemical Biology	1	CHEM10004 or CHEM10006

NEW to 2026!!!

Subject Code	Subject Name	Semester	Prerequisites
Third Year Electives			
CHEM30018	Advances in Chemical Biology	1	CHEM20026

This subject explores cutting-edge developments in chemical biology, focusing on their application to therapeutic discovery, development, and use, as well as to probing and perturbing biological systems. Students will examine the interface between chemistry and biology through the lens of drug design, delivery, and efficacy, alongside broader applications of chemical tools to investigate and manipulate biological function. Topics include the molecular basis of drug action, strategies for targeted delivery and formulation, mechanisms of resistance, chemical approaches for studying biological processes, and analytical methods for monitoring therapeutic responses.

Chemistry – Research Project

Subject Code	Subject Name	Semester
Research Project		
CHEM30013	Chemistry Research Project	2 and Summer

(prerequisite is 50 pts of 3rd year Chemistry subjects)

You will carry out a short chemical investigation under the direction of a School of Chemistry staff member. You will be working in their research labs, together with Master's and PhD students, to experience what 'research' looks like.

What if I like Chemistry but have chosen a different Major?

Subject Code	Subject Name	Semester	Prerequisites
CHEM20011	Environmental Chemistry	1	CHEM10004 or CHEM10006
CHEM30012	Analytical and Environmental Chemistry	1	CHEM20011 or CHEM20019

Subject Code	Subject Name	Semester	Prerequisites
CHEM20026	Principles of Chemical Biology	1	CHEM10004 or CHEM10006
CHEM30018	Advances in Chemical Biology	1	CHEM20026

Strategic Sciences Program (SSP)

What is SSP?

The Strategic Sciences Program connects students to experiences and activities to develop the skills and knowledge essential for diverse STEM careers.

What will you get?

1. Emails on STEM-related events
2. A one-on-one career consultation in the second year of your study

Scan the QR code to join

Chemistry Major (Chemistry Specialisation)					
First Year	Semester 1	Chemistry 1 CHEM10003	Calculus 1 or Calculus 2 MAST10005 or MAST10006	Today's Science, Tomorrow's World (compulsory)	Breadth
	Semester 2	Chemistry 2 CHEM10004	Calculus 2 or Linear Algebra MAST10006 or MAST10007	Science Subject	Breadth
Second Year	Semester 1	Reactions and Synthesis CHEM20018	Environmental Chemistry CHEM20011	Principles of Chemical Biology CHEM20026	Breadth
	Semester 2	Structures and Properties CHEM20020	Practical Chemistry 2 CHEM20019	Science Subject	Breadth
Third Year	Semester 1	Reactivity and Mechanism CHEM30016	Advanced Practical Chemistry CHEM30015	Specialised Topics in Chemistry A CHEM30017	Breadth or Science Subject
	Semester 2	Specialised Topics in Chemistry B CHEM30014	Analytical and Environmental Chemistry CHEM30012	Chemistry Research Project CHEM30013	Science Subject

Core to Chemistry Major

Chemistry electives

Science electives

Breadth

Chemistry Major (Medicinal Chemistry Specialisation)					
First Year	Semester 1	Chemistry 1 CHEM10003	Calculus 1 or Calculus 2 MAST10005 or MAST10006	Today's Science, Tomorrow's World (compulsory)	Foundational Biology – Life's Machinery BIOL10008
	Semester 2	Chemistry 2 CHEM10004	Calculus 2 or Linear Algebra MAST10006 or MAST10007	Foundational Biology – Life's Complexity BIOL10010	Breadth
Second Year	Semester 1	Reactions and Synthesis CHEM20018	Principles of Chemical Biology CHEM20026	Breadth or Science subject	Breadth
	Semester 2	Structures and Properties CHEM20020	Practical Chemistry 2 CHEM20019	Pharmacology: How Drugs Work PHRM20001	Breadth
Third Year	Semester 1	Reactivity and Mechanism CHEM30016	Advanced Practical Chemistry CHEM30015	Specialised Topics in Chemistry A CHEM30017	Breadth
	Semester 2	Drugs: From Discovery to Market PHRM30008	Drugs in Biomedical Experiments PHRM30009	Specialised Topics in Chemistry B CHEM30014	Chemistry Research Project CHEM30013 or Science subject

Core to Chemistry Major – Medicinal Chemistry Specialisation

Electives for Chemistry Major – Medicinal Chemistry Specialisation

Science electives

Breadth

Chemistry Major (Chemistry Specialisation) with Biochemistry and Pharmacology					
First Year	Semester 1	Chemistry 1 CHEM10003	Calculus 1 or Calculus 2 MAST10005 or MAST10006	Foundational Biology: Life's Machinery BIOL10008	Today's Science, Tomorrow's World (compulsory)
	Semester 2	Chemistry 2 CHEM10004	Science elective	Science elective	Breadth
Second Year	Semester 1	Reactions and Synthesis CHEM20018	Principles of Chemical Biology CHEM20026	Biochemistry and Molecular Biology BCMB20002	Breadth
	Semester 2	Structures and Properties CHEM20020	Practical Chemistry 2 CHEM20019	Techniques in Molecular Science BCMB20005	Pharmacology: How Drugs Work PHRM20001 or Science elective
Third Year	Semester 1	Reactivity and Mechanism CHEM30016	Advanced Practical Chemistry CHEM30015	Specialised Topics in Chemistry A CHEM30017	Breadth
	Semester 2	Specialised Topics in Chemistry B CHEM30014	Current Advances in Molecular Science BCMB30012	Protein Structure and Function BCM30001*	Breadth

Core to Chemistry Major

Electives for Chemistry Major

Science electives

Breadth

*Students may alternatively choose: (i) Drugs: From Discovery to Market (PHRM30008) or (ii) Drugs in Biomedical Experiments PHRM30009.

Chemistry Major (Chemistry Specialisation) with Environmental Science					
First Year	Semester 1	Chemistry 1 CHEM10003	Calculus 1 or Calculus 2 MAST10005 or MAST10006	The Global Environment EVSC10001	Today's Science, Tomorrow's World (compulsory)
	Semester 2	Chemistry 2 CHEM10004	Foundational Biology: Life's Complexity BIOL10010	Science elective	Breadth
Second Year	Semester 1	Reactions and Synthesis CHEM20018	Environmental Chemistry CHEM20011	Analysis of Biological Data MAST20031	Landscapes and Environmental Change GEOG20002
	Semester 2	Structures and Properties CHEM20020	Practical Chemistry 2 CHEM20019	Breadth	Breadth
Third Year	Semester 1	Reactivity and Mechanism CHEM30016	Advanced Practical Chemistry CHEM30015	Specialised Topics in Chemistry A CHEM30017	Environmental Risk Assessment EVSC30003
	Semester 2	Specialised Topics in Chemistry B CHEM30014	Analytical and Environmental Chemistry CHEM30012	Breadth	Chemistry Research Project CHEM30013*

Core to Chemistry Major

Electives for Chemistry Major

Science electives

Breadth

* Students may alternatively choose Problem Solving in Environmental Science (EVSC30002)

Chemistry Major (Chemistry Specialisation) with Maths and Physics					
First Year	Semester 1	Chemistry 1 CHEM10003	Calculus 1 or Calculus 2 MAST10005 or MAST10006	Physics 1 PHYC10003	Today's Science, Tomorrow's World (compulsory)
	Semester 2	Chemistry 2 CHEM10004	Calculus 2 or Linear Algebra* MAST10006 or MAST10007	Physics 2: Physical Science and Technology PHYC10004	Breadth
Second Year	Semester 1	Reactions and Synthesis CHEM20018	Quantum and Thermal Physics PHYC20012	Vector Calculus MAST20009	Breadth
	Semester 2	Structures and Properties CHEM20020	Practical Chemistry 2 CHEM20019	Special Relativity and Electromagnetism PHYC20015	Theoretical Physics 2 PHYC20014
Third Year	Semester 1	Reactivity and Mechanism CHEM30016	Advanced Practical Chemistry CHEM30015	Specialised Topics in Chemistry A CHEM30017	Quantum Physics PHYC30018
	Semester 2	Specialised Topics in Chemistry B CHEM30014	Statistical Physics PHYC30017	Breadth	Breadth

Core to Chemistry Major

Electives for Chemistry Major

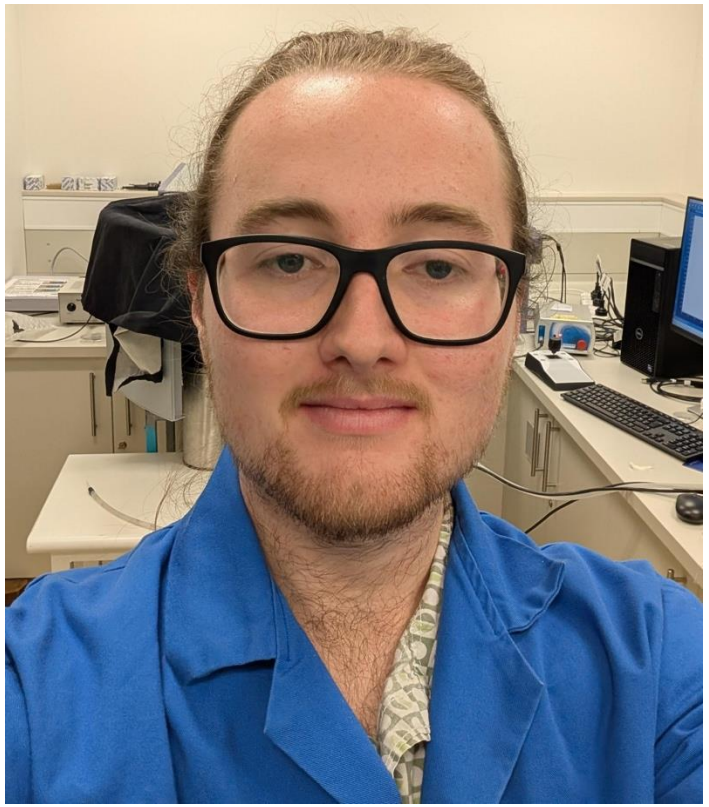
Science electives

Breadth

*Note that MAST10007 (Linear Algebra) is a prerequisite for MAST20009, PHYC20012, PHYC20014 and PHYC20015.

Current Students

Cassandra McLoughlin
3rd Year Chemistry Student



Riley Taylor
Honours Student

Lachlan Raftery
1st year MSc


Questions!