Welcome to the School of Chemical Sciences

Medicinal Chemists design and develop drugs for the treatment of disease. A degree in Medicinal Chemistry will provide you with a strong foundation in chemistry as well as biology and pharmacology.

Medicinal Chemistry is one of the most rapidly developing areas within the discipline of chemistry, both globally and locally. It is the study of the design, biochemical effects, regulatory and ethical aspects of drugs for the treatment of disease. The aim of this major is to produce graduates with an appropriate background in biology and pharmacology, built upon a strong chemistry foundation. The Medicinal Chemistry major at the University of Auckland is the only major of its kind in New Zealand.

While our School of Chemical Sciences also offers undergraduate qualifications in Chemistry and in Food Science and Nutrition, we also offer postgraduate qualifications in Chemistry, Food Science, Forensic Science, Medicinal Chemistry and Wine Science for those students who seek to continue their chemical education.

This handbook outlines the courses offered and provides information to assist you in planning your degree. We look forward to you joining us in this exciting field of research.

DISTINGUISHED PROFESSOR MARGARET BRIMBLE
Director of Medicinal Chemistry
Bachelor of Science in Medicinal Chemistry

The Medicinal Chemistry major provides students with training appropriate for entry into the pharmaceutical industry.

Preparation for school leavers
Preparatory chemistry online is designed to assist prospective first year chemistry students who have had some years away from formal study, or who do not have a strong background in chemistry.

www.chemistry.auckland.ac.nz/preparatory

Why study Medicinal Chemistry?
The BSc and BSc(Hons) in Medicinal Chemistry are the first of their kind to be offered in New Zealand. The primary objective of Medicinal Chemistry is to design and discover new compounds that are suitable for use as new drugs. Not only does this include designing and synthesising new drugs and medicines, but also teaches students to understand how a substance operates in the body and its suitability for use as a drug.
**BSc degree planner – Medicinal Chemistry**

### BSc

#### Year 1
- BIOSCI 101
- BIOSCI 106
- BIOSCI 107
- CHEM 110
- CHEM 120
- MEDSCI 142
- YEAR I ELECTIVE
- GEN ED

#### Year 2
- BIOSCI 201
- BIOSCI 203
- CHEM 230
- CHEM 240
- MEDSCI 204
- MEDSCI 205
- YEAR II ELECTIVE
- GEN ED

#### Year 3
- CHEM 330
- CHEM 390
- CHEM 392
- MEDSCI 303
- YEAR III ELECTIVE
- YEAR III ELECTIVE

- Any Stage

Year 1 Elective:
- COMPSCI 111,
- STATS 101,
- PHYSICS 120, 180

Year 2 Elective:
- BIOSCI 202, 204,
- CHEM 210, 220, 260,
- MEDSCI 202, 203

Year 3 Elective:
- CHEM 320, 340, 350, 360,
- BIOSCI 349, 350, 351, 353-356,
- MEDSCI 206, 305, 306

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1. Courses in a minimum of three subjects listed in the BSc Schedule.
2. At least 180 points (12 courses) must be above Stage I.
3. Up to 30 points (two courses) may be taken from outside the faculty.
4. 30 points (two courses) must be taken from the appropriate General Education Schedules for BSc students.
5. At least 75 points must be at Stage III, of which 60 points must be in the majoring subject.

To view regulations for majors, and course descriptions, see [www.calendar.auckland.ac.nz](http://www.calendar.auckland.ac.nz)

BSc degree requires: 360 points (24 x 15 point courses). Each box represents one 15 point course. We recommend that students enrol in eight courses each year.

Degree Planners for double majors can be found at [www.science.auckland.ac.nz/course-planning](http://www.science.auckland.ac.nz/course-planning)

It is the student’s responsibility to check that the final programme complies with University Regulations. The Faculty of Science is the final authority on all BSc regulations.
## Undergraduate Medicinal Chemistry Courses

### Stage I

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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</thead>
<tbody>
<tr>
<td>BIOSCI 101</td>
<td>Essential Biology: From Genomes to Organisms</td>
</tr>
<tr>
<td>BIOSCI 106</td>
<td>Foundations of Biochemistry</td>
</tr>
<tr>
<td>BIOSCI 107</td>
<td>Biology for Biomedical Science: Cellular Processes and Development</td>
</tr>
<tr>
<td>CHEM 110</td>
<td>Chemistry of the Living World</td>
</tr>
<tr>
<td>CHEM 120</td>
<td>Chemistry of the Material World</td>
</tr>
<tr>
<td>MEDSCI 142</td>
<td>Biology for Biomedical Science: Organ Systems</td>
</tr>
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</table>

**15 point elective:**

<table>
<thead>
<tr>
<th>Course Code</th>
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</thead>
<tbody>
<tr>
<td>COMPSCI 111</td>
<td>An Introduction to Practical Computing</td>
</tr>
<tr>
<td>STATS 101</td>
<td>Introduction to Statistics</td>
</tr>
<tr>
<td>PHYSICS 120</td>
<td>Advancing Physics 1</td>
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<tr>
<td>PHYSICS 160</td>
<td>Physics for the Life Sciences</td>
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### Stage II

<table>
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<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>BIOSCI 201</td>
<td>Cellular and Molecular Biology</td>
</tr>
<tr>
<td>BIOSCI 203</td>
<td>Biochemistry</td>
</tr>
<tr>
<td>CHEM 230</td>
<td>Molecules for Life: Synthesis and Reactivity</td>
</tr>
<tr>
<td>CHEM 240</td>
<td>Measurement and Analysis in Chemistry and Health Sciences</td>
</tr>
<tr>
<td>MEDSCI 204</td>
<td>Introduction to Pharmacology and Toxicology</td>
</tr>
<tr>
<td>MEDSCI 205</td>
<td>The Physiology of Human Organ Systems</td>
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</tbody>
</table>

**15 point elective:**

<table>
<thead>
<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>BIOSCI 202</td>
<td>Genetics</td>
</tr>
<tr>
<td>BIOSCI 204</td>
<td>Principles of Microbiology</td>
</tr>
<tr>
<td>CHEM 210</td>
<td>Physical and Materials Chemistry</td>
</tr>
<tr>
<td>CHEM 220</td>
<td>Inorganic Compounds: Structure, Bonding and Reactivity</td>
</tr>
<tr>
<td>CHEM 260</td>
<td>Introduction to Green Chemistry</td>
</tr>
<tr>
<td>MEDSCI 202</td>
<td>Microbiology and Immunology</td>
</tr>
<tr>
<td>MEDSCI 203</td>
<td>Mechanisms of Disease</td>
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</tbody>
</table>

### Stage III

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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</thead>
<tbody>
<tr>
<td>CHEM 330</td>
<td>Contemporary Organic Chemistry</td>
</tr>
<tr>
<td>CHEM 390</td>
<td>Medicinal Chemistry</td>
</tr>
<tr>
<td>CHEM 392</td>
<td>Issues in Drug Design and Development</td>
</tr>
<tr>
<td>MEDSCI 303</td>
<td>Principles of Pharmacology</td>
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</tbody>
</table>

**30 points electives:**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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</thead>
<tbody>
<tr>
<td>CHEM 320</td>
<td>Design and Reactivity of Inorganic Compounds</td>
</tr>
<tr>
<td>CHEM 340</td>
<td>Advanced Analytical Chemistry</td>
</tr>
<tr>
<td>CHEM 350</td>
<td>Topics in Chemistry</td>
</tr>
<tr>
<td>CHEM 360</td>
<td>Contemporary Green Chemistry</td>
</tr>
<tr>
<td>BIOSCI 349</td>
<td>Biomedical Microbiology</td>
</tr>
<tr>
<td>BIOSCI 350</td>
<td>Protein Structure and Function</td>
</tr>
<tr>
<td>BIOSCI 351</td>
<td>Molecular Genetics</td>
</tr>
<tr>
<td>BIOSCI 353</td>
<td>Molecular and Cellular Regulation</td>
</tr>
<tr>
<td>BIOSCI 354</td>
<td>Gene Expression and Gene Transfer</td>
</tr>
<tr>
<td>BIOSCI 356</td>
<td>Developmental Biology and Cancer</td>
</tr>
<tr>
<td>MEDSCI 206</td>
<td>Introduction to Neuroscience</td>
</tr>
<tr>
<td>MEDSCI 305</td>
<td>Systematic Pharmacology</td>
</tr>
<tr>
<td>MEDSCI 306</td>
<td>Principles of Toxicology</td>
</tr>
</tbody>
</table>

For course descriptions and prerequisite information: [www.chemistry.auckland.ac.nz/courses](http://www.chemistry.auckland.ac.nz/courses)

Thinking about postgraduate study options? [www.chemistry.auckland.ac.nz/pg](http://www.chemistry.auckland.ac.nz/pg)
Casey Park is studying toward a Bachelor of Science majoring in Medical Chemistry.

"I remember the exact moment when I decided to pursue Medicinal Chemistry. In year 12, I came to the University open day (Courses and Careers Day) and attended a lecture about Medicinal Chemistry by Distinguished Professor Margaret Brimble. She explained some of the amazing accomplishments she has made in the area, and how they have affected so many people's lives. I was deeply inspired by this and was determined to take Medicinal Chemistry. Also, I enjoyed both chemistry and biology at school, and Medicinal Chemistry is a combination of both. So, it was perfect for me!

"Medicinal Chemistry is about designing, synthesising and discovering drugs by using fundamental knowledge from chemistry as well as other fields in science. I have gained an unbelievable amount of knowledge about not only chemistry, but also areas such as physiology and immunology, which I have realised I have a very deep interest in.

"This major helps you to figure out what you are genuinely passionate about by letting you explore a variety of different papers. It is very challenging, but what you gain from it makes everything worth it.

"I would like to go into research. I have been taking an immunology paper, which I am absolutely in love with. I’d like to be involved in designing and synthesising drugs that could cure various immunological diseases! I would love to take part in making innovations in the field of medicine that will enhance quality of life."

Positions and roles:
Developing guidelines and reviewing new drug applications
Drug development, including drug formulation
Testing potential new bio-active compounds

Employment opportunities available at:
Biomedical and pharmaceutical companies
Crown Research Institutes
Government authorities and agencies
Hospitals
Private research institutions

Careers in Medicinal Chemistry

The three-year BSc major in Medicinal Chemistry and the one-year BSc(Hons) in Medicinal Chemistry are both designed to produce high quality graduates equipped with the multidisciplinary knowledge and skills relevant to a rapidly expanding pharmaceutical industry.
Helpful information

Academic dates
www.auckland.ac.nz/dates

Academic Integrity Course
www.auckland.ac.nz/academic-integrity

Accommodation
www.accommodation.auckland.ac.nz

Buy coursebooks
www.science.auckland.ac.nz/resource-centre

Career Development and Employment Services
www.auckland.ac.nz/careers

Course advice and degree planning in Science
www.science.auckland.ac.nz/student-centre

General education
www.auckland.ac.nz/generaleducation

How to apply
www.apply.auckland.ac.nz

How to enrol
www.auckland.ac.nz/enrolment

International students
www.international.auckland.ac.nz

Māori and Pacific students
www.science.auckland.ac.nz/tuakana

Need help?
www.askauckland.ac.nz

Rainbow Science Network for LGBTI students
www.science.auckland.ac.nz/rainbowscience

Scholarships and awards
www.scholarships.auckland.ac.nz

Support for students
www.science.auckland.ac.nz/support

APPLICATIONS CLOSE ON
8 DECEMBER

Questions about
Medicinal Chemistry?
m.brimble@auckland.ac.nz

Disclaimer
Although every reasonable effort is made to ensure accuracy, the information in this document is provided as a general guide only for students and is subject to alteration. All students enrolling at the University of Auckland must consult its official document, the University of Auckland Calendar, to ensure that they are aware of and comply with all regulations, requirements and policies.