

# School of Chemical and Physical Sciences

# POSTGRADUATE CHEMISTRY

>> 2026



## Contact

School of Chemical and Physical Sciences — *Te Wānanga Matū*

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[www.wgtn.ac.nz/chemistry](http://www.wgtn.ac.nz/chemistry)

## POSTGRADUATE STUDIES

| UNDERGRADUATE                                            |                                                                                        | POSTGRADUATE         |               |
|----------------------------------------------------------|----------------------------------------------------------------------------------------|----------------------|---------------|
| 100–300 LEVEL                                            | 400 LEVEL                                                                              | 500 LEVEL            | 600 LEVEL     |
| BSc (3 years)<br>BBmedSc (3 years)<br>GDipSc (1–2 years) | PGCertSc (1 trimester)<br>BSc (Hons) (1 year)<br>PGDip (1 year)<br>MSc Part I (1 year) | MSc Part II (1 year) | PhD (3 years) |

### Honours (Hons)

- A one-year programme
- Has a research project
- Requires a B+ grade average in related 300-level subjects for admission. An exemption may be granted with approval of the Head of School
- May allow direct admission to a PhD degree in New Zealand, or to MSc part II

### Postgraduate Certificate in Science (PGCertSc)

- One semester full-time or up to two years part-time
- Usually consists of all course work (60 points) at postgraduate level
- Usually requires a B grade average in related 300-level subjects for admission
- Endorsed in a subject offered for the MSc degree.
- May be converted to a PGDipSc programme with the addition of 60 further approved points

### Postgraduate Diploma in Science (PGDipSc)

- One year full-time or up to four years part-time
- Usually consists of course work and a research project (120 points total) at postgraduate (400) level
- Usually requires a B grade average in related 300-level subjects for admission
- Endorsed in a subject offered for the MSc degree
- May permit admission to an MSc by Thesis if achieved at a high academic level

### Master of Science (MSc)

- Two years full-time or up to four years part-time
- Consists of postgraduate course work in the first year and includes research preparation
- Admission to Part 2 based on academic performance in Part 1 or BSc(Hons)
- The second year involves research and submission of a thesis
- Requires a B+ grade average in related 300-level subjects for admission
- Awarded with Honours (two-year MSc) or distinction/merit (MSc by thesis only)

## WHO TO CONTACT

### **TĪTOKO—STUDENT SUCCESS TEAM, TE WĀHANGA PŪTAIAO**

Address: CO144, Ground floor, Cotton building,  
Gate 7, Kelburn Parade  
Kelburn campus

Phone: 0800 04 04 04

Email: [info@vuw.ac.nz](mailto:info@vuw.ac.nz)

Website: <https://www.wgtn.ac.nz/science/current-students>

Hours: 9 am–4 pm, Monday to Friday

|                          |                        |               |
|--------------------------|------------------------|---------------|
| Manager, Student Success | Greg Ambrose           | 0800 04 04 04 |
| Associate Dean, Students | Dr Sarah-Jane O'Connor | 0800 04 04 04 |

The Titoko—Centre for Student Success team offers a range of services that cover all student-related matters from applications and enrolment to graduation.

### **SCHOOL STAFF CONTACTS**

|                                   |                        |        |             |
|-----------------------------------|------------------------|--------|-------------|
| Head of School                    | A/Prof Rob Keyzers     | AM 208 | 04 463 5117 |
| Deputy Head of School (Chemistry) | A/Prof Joanne Harvey   | AM 207 | 04 463 5956 |
| Deputy Head of School (Physics)   | A/Prof Petrik Galvosas | LB 308 | 04 463 5911 |
| School Manager                    | Kara Eaton             | LB 406 | 04 463 5946 |
| General Enquiries (Chemistry)     | Shohana Swortzel       | LB 103 | 04 886 5328 |
| General Enquiries (Physics/Space) | Kate Davies            | LB 103 | 04 463 5335 |

### **CHEMISTRY ENQUIRIES**

|                          |                      |        |             |
|--------------------------|----------------------|--------|-------------|
| Programme Director       | A/Prof Mattie Timmer | LB 507 | 04 463 6529 |
| BSc(Hons) and MSc Part 1 | Dr Luke Liu          | AM 202 | 04 463 5591 |
| MSc Part 2 and PhD       | Prof Martyn Coles    | LB 506 | 04 463 6357 |

### **PHYSICS ENQUIRIES**

|                           |                    |        |             |
|---------------------------|--------------------|--------|-------------|
| Programme Director (PHYS) | Prof Franck Natali | LB 513 | 04 463 5804 |
| Programme Director (SPCE) | Dr Tulasi Parashar | LB 516 | 04 463 5804 |
| BSc(Hons) and MSc Part 1  | Dr Yvette Perrott  | LB 523 | 04 463 6543 |
| MSc Part 2 and PhD        | Prof Uli Zülicke   | LB 413 | 04 463 6851 |

## CHEMISTRY ACADEMICS

|                      |                                                                                                  |        |             |
|----------------------|--------------------------------------------------------------------------------------------------|--------|-------------|
| Dr Mat Anker         | Inorganic chemistry, catalysis, small molecule activation                                        | AM201  | 04 463 9712 |
| Prof Martyn Coles    | main group chemistry, hydrogen-bonded materials                                                  | LB 506 | 04 463 6357 |
| A/Prof Nate Davis    | Photophysics and solar energy, nanocrystals, organic chromophores, up and down conversion        | AM 206 | 04 463 7134 |
| A/Prof Robin Fulton  | Inorganic synthesis and mechanisms, environmental chemistry                                      | LB 514 | 04 463 9799 |
| Dr Alex Hamilton     | Chemistry Education                                                                              | AM 202 | 04 463 5962 |
| A/Prof Joanne Harvey | Total synthesis, design and synthesis of natural product analogues, organic reaction methodology | AM 207 | 04 463 5956 |
| Prof Patricia Hunt   | Theoretical and Computational Chemistry                                                          | LB 405 | 04 463 5954 |
| A/Prof Rob Keyzers   | Natural products, food and wine chemistry, NMR spectroscopy and mass spectrometry                | AM 208 | 04 463 5117 |
| Dr Luke Liu          | Synthesis of crystalline porous solids                                                           | AM 202 | 04 463 5591 |
| Dr Kim McKelvey      | Nanoscale electrochemistry for energy storage and conversion technologies                        | LB 504 | 04 463 5957 |
| Prof Bridget Stocker | Immunoglycomics, bio-organic, green chemistry                                                    | LB 508 | 04 463 6481 |
| A/Prof Mattie Timmer | Immunoglycomics, design and synthesis of glyconjugate probes                                     | LB 507 | 04 463 6529 |

## PHYSICS ACADEMICS

|                        |                                                                                                    |        |             |
|------------------------|----------------------------------------------------------------------------------------------------|--------|-------------|
| Dr Baptiste Augu       | Nano-optics and spectroscopy                                                                       | LB 522 | 04 463 5547 |
| Dr Morgan Cable        | Astrobiology                                                                                       | LB 503 |             |
| A/Prof Petrik Galvosas | NMR methodologies for molecular dynamics in soft matter and porous material, NMR instrumentation   | LB 308 | 04 463 5911 |
| Prof Michele Governale | Theoretical condensed-matter physics, quantum transport in nanoscale systems                       | LB 402 | 04 463 5951 |
| Prof Eric Le Ru        | Electromagnetism, fluorescence and Raman spectroscopy                                              | LB 205 | 04 463 7509 |
| Prof Franck Natali     | Novel materials for electronic and optoelectronic applications                                     | LB 513 | 04 463 5804 |
| Dr Tulasi Parashar     | Plasma physics                                                                                     | LB 516 | 04 463 5804 |
| Dr Yvette Perrott      | Astrophysics                                                                                       | LB 523 | 04 463 6543 |
| A/Prof Natalie Plank   | Electronic device properties of nanomaterials                                                      | LB 510 | 04 463 5031 |
| Prof Ben Ruck          | Experimental condensed matter physics                                                              | LB 406 | 04 463 5089 |
| Dr Kadin Thompson      | Physics education and condensed matter theory                                                      | LB 521 |             |
| Prof Uli Z  licke      | Theoretical condensed-matter physics, electronic transport and spin-electronic devices, cold atoms | LB 413 | 04 463 6851 |

## EMERITUS ACADEMICS

|                     |                                                                                           |        |             |
|---------------------|-------------------------------------------------------------------------------------------|--------|-------------|
| E/Prof John Lekner  | Electrodynamics, quantum theory, fluid mechanics. Theory of reflection of waves           | LB 519 | 04 463 5949 |
| E/Prof John Spencer | Inorganic/organometallic chemistry; synthesis and properties of transition metal hydrides | LB 403 | 04 463 5119 |
| E/Prof Joe Trodahl  | Ferromagnetic semiconductors for spintronics, ferroelectric oxides, heat flow in sea ice  | LB 516 | 04 463 5964 |

## HONOURS

The programme leading to an Honours degree in Chemistry is intended to provide candidates with a thorough understanding of the important principles and practices in the subject. The course work is rigorous and the experimental project work (carried out under the supervision and guidance of a member of the academic staff) is demanding.

A total of 120 points are required for Honours, with the standard option being CHEM421 – CHEM425 together with CHEM480 (Research Preparation) and CHEM489 (Research Project).

Flexibility is provided through CHEM441 (Directed Individual Study) which is a programme that can be tailored to the requirements of the individual student.

|                 |                  |                                          |               |          |
|-----------------|------------------|------------------------------------------|---------------|----------|
| <b>CHEM 421</b> | <b>CRN 13725</b> | <b>Organic and Bio-organic Chemistry</b> | <b>15 PTS</b> | <b>2</b> |
|-----------------|------------------|------------------------------------------|---------------|----------|

**Prerequisites:** 15 pts from CHEM308, 309 (or 301)

**Restrictions:** none

Advanced aspects of organic chemistry are discussed, including the mechanisms of reaction, stereochemistry and the experimental methods of elucidating structure, applications of spectroscopy to organic chemistry, and modern strategies for the synthesis of molecules, particularly those with asymmetric centres.

|                 |                  |                            |               |          |
|-----------------|------------------|----------------------------|---------------|----------|
| <b>CHEM 422</b> | <b>CRN 13726</b> | <b>Inorganic Chemistry</b> | <b>15 PTS</b> | <b>1</b> |
|-----------------|------------------|----------------------------|---------------|----------|

**Prerequisites:** CHEM310 (or 302)

**Restrictions:** none

Key areas of modern inorganic chemistry are discussed, including the mechanisms of reaction of transition metal compounds, the structure of inorganic and organometallic compounds and materials, methods of structure elucidation, aspects of organometallic chemistry and homogeneous catalysis.

|                 |                  |                           |               |          |
|-----------------|------------------|---------------------------|---------------|----------|
| <b>CHEM 423</b> | <b>CRN 13727</b> | <b>Physical Chemistry</b> | <b>15 PTS</b> | <b>1</b> |
|-----------------|------------------|---------------------------|---------------|----------|

**Prerequisites:** CHEM310 (or 303)

**Restrictions:** none

This course will discuss advanced aspects of physical chemistry and materials science, including statistical thermodynamics, the structure and properties of colloids, and the chemistry and applications of nanostructured materials.

|                 |                  |                                        |               |          |
|-----------------|------------------|----------------------------------------|---------------|----------|
| <b>CHEM 424</b> | <b>CRN 13728</b> | <b>Advanced Aspects of Chemistry A</b> | <b>15 PTS</b> | <b>1</b> |
|-----------------|------------------|----------------------------------------|---------------|----------|

**Prerequisites:** none

**Restrictions:** none

Students choose topics offered by staff from across the range of chemistry. Typical areas might include: the design and practice of total synthesis; advanced applications of NMR, electron transfer in chemistry and biology; atmospheric chemistry; scanning probe microscopy; homogeneous and heterogeneous catalysis; sigma-complexes and C-H activation; advanced materials.

|                 |                  |                                        |               |          |
|-----------------|------------------|----------------------------------------|---------------|----------|
| <b>CHEM 425</b> | <b>CRN 13729</b> | <b>Advanced Aspects of Chemistry B</b> | <b>15 PTS</b> | <b>2</b> |
|-----------------|------------------|----------------------------------------|---------------|----------|

**Prerequisites:** none

**Restrictions:** none

Students choose topics offered by staff from across the range of chemistry. Typical areas might include: manganese in biological systems; electron microscopy, multinuclear solid state NMR-theory and application; molecular modelling; advanced materials; structural analysis by single crystal X-ray diffraction.

|                 |                                                          |                                  |               |                                      |
|-----------------|----------------------------------------------------------|----------------------------------|---------------|--------------------------------------|
| <b>CHEM 440</b> | <b>CRN 10014</b><br><b>CRN 33469</b><br><b>CRN 35027</b> | <b>Directed Individual Study</b> | <b>30 PTS</b> | <b>1+2</b><br><b>3</b><br><b>2+3</b> |
|-----------------|----------------------------------------------------------|----------------------------------|---------------|--------------------------------------|

**Prerequisites:** permission of the head of school

**Restrictions:** none

A supervised programme of study approved by the Head of School.

|                 |                  |                                  |               |            |
|-----------------|------------------|----------------------------------|---------------|------------|
| <b>CHEM 441</b> | <b>CRN 13732</b> | <b>Directed Individual Study</b> | <b>15 PTS</b> | <b>1</b>   |
|                 | <b>CRN 13733</b> |                                  |               | <b>2</b>   |
|                 | <b>CRN 13734</b> |                                  |               | <b>3</b>   |
|                 | <b>CRN 19972</b> |                                  |               | <b>2+3</b> |

**Prerequisites:** permission of head of school

**Restrictions:** none

A supervised programme of study approved by the Head of School. This might include, where appropriate, following an approved course of study as prescribed for CHEM301, 302 or 303.

|                 |                  |                             |               |          |
|-----------------|------------------|-----------------------------|---------------|----------|
| <b>CHEM 480</b> | <b>CRN 13736</b> | <b>Research Preparation</b> | <b>15 PTS</b> | <b>2</b> |
|                 | <b>CRN 13735</b> |                             |               | <b>1</b> |
|                 | <b>CRN 28320</b> |                             |               | <b>3</b> |

**Prerequisites:** none

**Restrictions:** CHEM580

Training in advanced skills required to research and to communicate the results, including utilising the chemical literature, record keeping, writing reports and proposals, and techniques of oral communication.

|                 |                  |                         |              |            |
|-----------------|------------------|-------------------------|--------------|------------|
| <b>CHEM 489</b> | <b>CRN 735</b>   | <b>Research Project</b> | <b>0 PTS</b> | <b>1+2</b> |
|                 | <b>CRN 13723</b> |                         |              | <b>2+3</b> |
|                 | <b>CRN 13724</b> |                         |              | <b>3+1</b> |
|                 | <b>CRN 17303</b> |                         |              | <b>1+2</b> |

**Prerequisites:** none

**Restrictions:** none

## **MASTER OF SCIENCE IN CHEMISTRY**

The Master of Science (MSc) in Chemistry programme includes the same 400-level lecture courses as above for Honours, apart from CHEM480 and CHEM489 which are replaced by CHEM580. CHEM580 is a compulsory course for the MSc in chemistry and is worth 30 points. BSc(Hons) candidates are eligible to change to MSc Part 1 at any time prior to examination for the BSc(Hons) degree, with approval of the School.

The research project (CHEM591) forms Part 2 of the degree programme with a formal thesis submission. The time commitment for Part 2 is normally 12 months but not more than 18 months including write-up and submission. Candidates may register for Part 2 immediately after completion and assessment of the written courses, including CHEM580, on 1 December or at any time thereafter, but normally no later than the commencement of the next academic teaching year.

Other assessments for MSc include two oral presentations, a full research proposal, an introduction to the thesis and draft submissions of the final thesis. Final submission must be no later than 18 months after first registration for Part 2 as this is the maximum time allowable under the MSc regulations for full-time study.

Students who have reached a satisfactory standard in the BSc(Hons) degree, PGDipSc or their equivalent may obtain an MSc degree by thesis alone by enrolling for the MSc Part 2. In this case the assessment is by thesis only, Honours are not awarded. However, the MSc may be awarded with merit or with distinction.

## **PHD IN CHEMISTRY**

The PhD is the internationally-recognised research degree in the scientific community, and the School of Chemical and Physical Sciences has a long history of successful completions.

### **Requirements:**

- All students must give three presentations during their studies and prepare and defend a full research proposal.
- Students are encouraged to attend, and participate in, national and international conferences.
- Formal assessment of the Chemistry PhD degree is by means of a thesis and an oral examination, but there are progress reports and seminars required during the course.

### **Prerequisites:**

Students must have a BSc(Hons), MSc, or equivalent, to be admitted to the PhD programme. MSc candidates may be eligible to change to a PhD at any time prior to examination for the MSc degree, with approval of the School.

### **Note:**

- Part-time students may carry out some of their research at their place of work and distance supervision for full-time and part-time students is also possible.
- Students may visit other national or international laboratories to complete part of their studies.
- All students are enrolled on a provisional basis for a minimum of 12 months before gaining full registration based on successful completion and examination of a full research proposal and oral presentation.

