Undergraduate courses 2019
Chemical and Physical Sciences

School of Chemical and Physical Sciences
Te Wānanga Matū

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THE VICTORIA BACHELOR OF SCIENCE

Bachelor of Science Degree Requirements

- A total of 360 points
- 210 points above 100-level, of which 150 points must be Science
- 75 points at 300-level
- 90 points can be from outside science (some majors also permit an additional 30 outside points).
- At least one Major, and a second Major may be from science or from any other first degree with a maximum of 150 points permitted from outside science.

Science Major Requirements

- 60 points at 300-level
- 60–80 points at 200-level
- 45–60 points at 100-level.

Science Minor Requirements

- 60 points above 100-level specified in the major, of which
- 15 points must be at 300-level.

COMBINING CHEMISTRY AND PHYSICS

If you complete majors in both subjects you will have a very full programme that leaves little room for any other interest subjects. In order to make it possible to fit the requirements of both majors into a three year programme, at 200-level: CHEM 205 is waived from the chemistry major requirement, and the elective 200-level physics course (normally PHYS 217 or PHYS 209) is waived from the Physics major. This concession applies only to students **completing** majors in both Physics and Chemistry.

Alternatively you can complete a major in one subject and a minor in the other subject. This entails completion of all the required courses of the major subject and 60 points above 100-level, including at least 15 points at 300-level, in the minor.

PLEASE NOTE

Cancellation of courses
The courses offered by the University and listed in this prospectus may be cancelled by the University as a result of insufficient resources or student demand, or if other unforeseen circumstances arise.

Timetable changes
Check the timetable online for confirmation of course times.
http://www.victoria.ac.nz/students/study/timetables

HOW TO USE THIS GUIDE

Course code	Course reference number	Title	Points	Trimester
CHEM114	**CRN 17148**	**PRINCIPLES OF CHEMISTRY**	**15 PTS**	**1/3**

YOUR PROGRAMME

Use this template to plan your programme. Start by adding in the core papers for your degree.

Year 1							120 points
Year 2							120 points
Year 3							120 points

CHEMISTRY

Chemistry is everywhere. It is fundamental to all living beings, physical processes, materials and the environment. Chemistry underlies all the functions of the human body, our food, the consumer goods we use, the buildings we live and work in, the energy we generate and consume and the air we breathe. Understanding chemistry is the basis for understanding the function and structure of all of these, and also for developing new materials, pharmaceuticals, consumer products, technologies and processes to enhance our lives.

MAJOR REQUIREMENTS FOR CHEMISTRY

a. CHEM 114, 115; 15 100-level MATH or PHYS points; 15 points from (BIOL 111, BMSC 117, BTEC 101, ESCI 111, 112, GEOG 114)
b. CHEM 201, 202, 203, 205, 206
c. 60 points from (CHEM 301, 302, 303, 305, 306)

ENTRY TO 100-LEVEL CHEMISTRY COURSES

Advanced entry
If you have achieved 18 credits in Chemistry at NCEA Level 3 (which includes at least an achieved grade in all three external achievement standards), you may enter at CHEM 114 in Tri 1

Intermediate entry
If you have fewer than 18 credits in Chemistry at NCEA Level 3 you will start with CHEM 113. If you achieve A- or better, you may take both CHEM 114 and CHEM 115 in Tri 2.

Novice entry
If you have not studied Chemistry to at least NCEA Level 2 you are strongly advised to take CHEM 191 in the summer trimester (see page 4).

WHO TO CONTACT

First year enquiries: Dr Suzanne Boniface (**suzanne.boniface@vuw.ac.nz**).
Second and third year enquiries: Dr Matthias Lein (**matthias.lein@vuw.ac.nz**).

100-LEVEL COURSES

CHEM 191	**(SEE STREAMS)**	**INTRODUCTORY CHEMISTRY**	**15 PTS**	**3/3**
Restrictions:		CHEM 113, 114		
Streams:		Stream 1: CRN 7193 (19 Nov – 24 Feb 2019) Stream 2: CRN 23006 (7 Jan – 24 Feb 2019)		

This summer bridging course, taught mostly online, may be used either to provide the basic chemical concepts and laboratory skills desirable for the study of chemistry at university level or as a refresher course for those who have studied some chemistry in the past. It is highly recommended for BBmedSc students who do not have an adequate background in chemistry. While CHEM 191 is designed for students with little or no previous experience of chemistry, it may be taken for credit by any student who has not already passed a higher level chemistry course. We strongly recommend students who have not completed level 2 NCEA Chemistry take CHEM 191 over the summer.

Note: There will be two intakes for CHEM 191.The second intake must finish at the same time as the November intake meaning students will be expected to complete two modules per week.

CHEM 113	**CRN 17147**	**CONCEPTS OF CHEMISTRY**	**15 PTS**	**1/3**
Prerequisites:		We strongly recommend students who have not completed level 2 NCEA Chemistry take CHEM 191 over the summer		
Restrictions:		CHEM 114, 115		

This course covers the fundamental concepts of Chemistry—the electronic structure and properties of atoms, periodic trends, chemical bonding, the relationship between structure and reactivity, chemical equilibria and thermodynamics, acids and bases, redox reactions, organic nomenclature and isomerism, the identification and reactivity of a selection of organic functional groups.

CHEM 114	**CRN 17148** **CRN 17170**	**PRINCIPLES OF CHEMISTRY**	**15 PTS**	**1/3** **2/3**
Prerequisites:		CHEM 113 or 18 AS credits at NCEA Level 3 Chemistry including: AS91390, AS91391 and AS91392 or equivalent background in Chemistry		

Principles of atomic and molecular structure; thermodynamics and kinetics; an introduction to the systematic chemistry of the main group of elements and transition metals and applications; and to a mechanistic interpretation of organic reactivity.

CHEM 115	**CRN 17149**	**STRUCTURE AND SPECTROSCOPY**	**15 PTS**	**2/3**
Prerequisites:		CHEM 114 or (A- or better in CHEM 113 and concurrent enrolment in CHEM 114)		

This is a unifying chemistry course in which we use a skills-based approach to chemical structural elucidation using electromagnetic radiation (i.e. light). In particular electronic, vibrational and rotational excitations, electron spin alignment and complete ejection of an electron, i.e. UV-Vis, IR, Microwave, NMR spectroscopies and X-ray diffraction will be explored from fundamentals to practical. Mass spectrometry will also be introduced.

200-LEVEL COURSES

CHEM 201	**CRN 8607**	**ORGANIC CHEMISTRY**	**15 PTS**	**2/3**
Prerequisite:		(CHEM 114, 115) or equivalent background		

This programme builds on CHEM 114 and CHEM 115 with a molecular orbital approach to the mechanisms of fundamental organic chemical reactions, leading to a survey of the chemistry of conjugated systems, aromatic compounds and carbonyl chemistry.

CHEM 202	**CRN 8608**	**INORGANIC AND MATERIALS CHEMISTRY**	**15 PTS**	**1/3**
Prerequisite:		(CHEM 114, 115) or equivalent background		

The course addresses the principles and applications of the chemistry of the p-block and d-block elements, the symmetry and shape of molecules, organometallic chemistry and the principles and applications of solid state inorganic chemistry, including the chemistry of inorganic materials.

CHEM 203	**CRN 7598**	**PHYSICAL AND PROCESS CHEMISTRY**	**15 PTS**	**2/3**
Prerequisite:		(CHEM 114, 115) or equivalent background		

We will explore a number of different topics, all aimed at building up a framework in which we can describe chemical systems. Thermodynamics and kinetics enable us to determine not only whether a transformation (e.g. a reaction) will occur but at what rate the transformation occurs, and if there is a choice of outcomes from the process which one will predominate. Computational chemistry is a tool that helps us to understand how and why molecules exist in the forms that they do and to explain their reactivities. This theory is essential in our understanding of chemistry. In the course we will also introduce the foundations of optical spectroscopy, enabling us to understand how spectra such as IR and UV/Vis appear as they do.

CHEM 205	**CRN 8610**	**CHEMICAL SYNTHESIS - LABORATORY COMPONENT**	**15 PTS**	**2/3**
Prerequisite:		(CHEM 114, 115) or equivalent background		

Note: It is strongly recommended that CHEM 201 and CHEM 202 are taken at the same time as CHEM205, or have been passed previously.

CHEM 205 provides the opportunity to develop practical skills, competence and confidence in the chemistry laboratory with particular reference to the synthesis and purification of molecules and compounds; functional group transformations; physical, chemical and spectroscopic characterisation; and multi-step chemical syntheses. The programme provides an introduction to the nature of research involving organic and inorganic bench chemistry.

CHEM 206	**CRN 8611**	**CHEMICAL METHODS AND PROCESSES - LABORATORY COMPONENT**	**15 PTS**	**1/3**
Prerequisite:		(CHEM 114, 115) or equivalent background		

The laboratory programme provides the opportunity to develop laboratory skills, competence and confidence in the chemistry laboratory with particular reference to experimental methods and procedures in chemistry and materials science. This includes the measurement and characterisation of chemical phenomena, properties and systems and chemical processes and their emulation.

CHEM 225	CRN 6730	ANALYTICAL CHEMISTRY	15 PTS	1/3

Prerequisites: CHEM 114 or equivalent background

The major methods of chemical analysis used by analytical chemists are presented. The emphasis in the lecture and the practical component is on the analysis of real samples and the solving of practical and environmental problems.

300-LEVEL COURSES

CHEM 301	CRN 9058	ORGANIC CHEMISTRY	15 PTS	1/3

Prerequisite: CHEM 201

Advanced topics in organic chemistry such as biosynthesis of biologically important molecules, chemistry of reactive intermediates, pericyclic reactions, organometallic reactions in synthesis, retrosynthetic analysis and carbohydrate chemistry.

CHEM 302	CRN 7600	INORGANIC AND MATERIALS CHEMISTRY	15 PTS	2/3

Prerequisite: CHEM 202

Advanced topics in molecular and solid state inorganic chemistry including bio-inorganic, organometallic and materials chemistry, and techniques associated with the elucidation of chemical structure and reactivity.

CHEM 303	CRN 7602	PHYSICAL AND PROCESS CHEMISTRY	15 PTS	1/3

Prerequisite: CHEM 203

Advanced topics in physical and process chemistry including dynamic electrochemistry; photochemistry and photophysics; colloids, surface chemistry and rheology; quantum chemistry; process chemistry including chemical reactors and kinetics, unit operations, heat and mass balance; chemical process development with examples from the chemical and energy industries.

CHEM 305	CRN 9059	CHEMISTRY SYNTHESIS LABORATORY	15 PTS	1/3

Prerequisites: CHEM 201, 205

This course involves the synthesis, isolation and purification of organic compounds. The programme provides for the development of advanced laboratory skills and the use of sophisticated techniques, including working under inert atmospheres and the application of advanced 2D NMR spectroscopy. Research principles and methodology are illustrated with an emphasis on problem solving in organic chemistry.

CHEM 306	CRN 9060	CHEMISTRY MATERIALS AND METHODS LABORATORY	15 PTS	2/3

Prerequisites: CHEM 202, 203, 206

An introduction to advanced techniques and instrumentation used in modern inorganic chemistry, materials science and physical chemistry. The emphasis will be on synthetic methods and instrumental techniques for structure determination and material characterisation and the principles of measurement.

PHYSICS

Physics is about understanding nature at its most fundamental, from elementary particles to complex materials, from the kinetic energy of a speeding missile to the nuclear energy released in the core of a star. The basic concepts of physics - the effect of a force for example – apply to multitudes of different situations, in all imaginable contexts: mechanical, electrical, magnetic, astronomical, chemical, geological, biological … the list goes on forever. Physics is thus the foundation on which all other branches of science are built. An understanding of the principles of physics is essential to virtually all applied disciplines such as engineering, architecture, environmental studies, medicine and information technology.

MAJOR REQUIREMENTS FOR PHYSICS

a. MATH 142, 151, PHYS 114, 115
b. MATH 243; PHYS 221, 222, 223; 15 further points from (ECEN 201–204, PHYS 201–299)
c. PHYS 304, 305, 307, 309

MAJOR REQUIREMENTS FOR APPLIED PHYSICS

a. MATH 142, 151, PHYS 114, 115
b. 30 points from PHYS 201–299; 30 further points from (ECEN 201–204, MATH 243, 244, PHYS 201–299)
c. PHYS 343; 30 further points from (ECEN 301 or 303, PHYS 301–399); 15 further approved 300-level points in Physics or a related subject

ENTRY TO 100-LEVEL PHYSICS COURSES

- Automatic entry to PHYS 114 and PHYS 115 is available to students who have studied physics and maths with calculus to Year 13 and gained:
    - NCEA: 18 credits of Level 3 Physics including standards AS91524 (Mechanical systems) and AS91526 (Electrical systems) and either AS91523 (Wave systems) or AS91521 (Practical investigation); Maths with calculus standards AS91578 (Differentiation) and 91579 (Integration); or
    - A Level: Passes with grade C or better in Physics and Mathematics; or
    - International Baccalaureate: Diploma including both Physics and Mathematics at Higher Level
- If you have studied physics and maths at school, but you don't meet the requirements for automatic entry, or you have other qualifications (e.g. from overseas schooling, or other tertiary education institutions), then you may still qualify. Please contact the Programme Director as early as possible, giving full details of your qualifications.
- Intermediary level physics and maths courses, PHYS 131, MATH 132, MATH 141 provide alternative routes to PHYS 114 and PHYS 115.
- Students who have achieved excellent high school and/or scholarship results across a broad range of physics and mathematics topics may be eligible for acceleration to one or more 200 level physics courses in their first year of study. Students interested in exploring this option should contact the Programme Director in mid-February or as soon as their results become available.

WHO TO CONTACT

All enquiries about undergraduate physics courses should be directed to the Physics Programme Director, A/Prof Gillian Turner (**gillian.turner@vuw.ac.nz**).

PHYS 114 CRN 7534 PHYSICS 1A 15 PTS 1/3

Prerequisites: NCEA Level 3 or equivalent in physics and calculus (see page 7 for details)

PHYS 114 covers non-relativistic mechanics, wave motion and quantum mechanics using calculus-based mathematics. Topics include kinematics and dynamics, fundamental conservation laws, rotational motion and oscillations, mechanical waves and an introduction to quantum physics.

PHYS 115 CRN 7535 PHYSICS 1B 15 PTS 2/3

Prerequisites: NCEA Level 3 or equivalent in physics and calculus (see page 7 for details)

PHYS 115 builds on NCEA-level electromagnetism, electric circuits, geometric and physical optics, thermal properties of matter and thermodynamics, and their applications using calculus-based mathematics.

PHYS 131 CRN 1177 ENERGY AND ENVIRONMENTAL PHYSICS 15 PTS 1/3

PHYS 131 uses basic physical concepts to study energy, Earth's energy resources and the physical environment. The advantages, disadvantages and environmental impact of various renewable and non-renewable energy resources are investigated, with particular emphasis on the New Zealand situation. Other environmental topics covered include thermal radiation, the greenhouse effect and global warming, atmospheric circulation and climate patterns, properties of the ozone layer, noise pollution, the physics of earthquake and extreme weather hazards, and radiation.

PHYS 132 CRN 1179 INTRODUCTORY ASTRONOMY 15 PTS 2/3

An elementary introduction to astronomy and astrophysics. Topics include the solar system and orbits, astronomical observations and techniques, the physics of the sun, stars, compact objects (black holes & neutron stars), as well as extragalactic astronomy and elementary cosmology. The laboratory component of the course introduces concepts in modern astronomical research and data analysis and includes an optional visit to the Carter Planetarium and Observatory.

ENGR141 CRN 30094 ENGINEERING SCIENCE 15 PTS 1/3

Prerequisites: 16 credits at NCEA level 3 mathematics or equivalent

ENGR 141 provides students with an introduction to the key skills and concepts in physics and chemistry, which underpin electronic engineering and computer systems design. Through studying areas such as energy, the structure and properties of matter, heat, battery chemistry and even some introductory rocket science ENGR 141 highlights the close relationship between modern electronics and the physical sciences.

ENGR142 CRN 27045 ENGINEERING PHYSICS FOR ELECTRONICS AND COMPUTER SYSTEMS 15 PTS 2/3

Prerequisites: Either ENGR141 and (ENGR121 or MATH141) or approved levels of achievement in NCEA level 3 in each of Physics and Calculus or equivalent
Restrictions: PHYS 115

ENGR 142 introduces Newton's laws and the basic rules of kinematics before moving on to the physics of wave motion and ending with the basics of DC and AC circuit theory. Lectures, assignments and laboratory work will all focus on the application of physics to engineering situations.

PHYS 209	CRN 6732	PHYSICS OF THE EARTH AND PLANETS	15 PTS	2/3
Prerequisites:		MATH 142, PHYS 114		

An introduction to the physical properties of the Solar System, including planetary dynamics, the effects of differential gravitational forces, planetary atmospheres, surfaces and the internal structures of planetary bodies. The internal structure of Earth is studied in some detail, combining information from geodesy, seismology, geomagnetism and heat flow. The course provides a comprehensive background in planetary physics and geophysics for students interested in or intending to pursue astrophysics, astronomy, geophysics or geology.

PHYS 217	CRN 10023	APPLIED PHYSICS	15 PTS	1/3
Prerequisites:		PHYS 115 or ENGR 142 and one of (PHYS 114, 122, 131)		
Restrictions:		CSEN 201 in 2007-10, ECEN 201 in 2010-13		

PHYS 217 introduces students to a number of topics in applied physics, including the acquisition of experimental data, data analysis techniques and the oral and written presentation of research results.

Not Offered in 2019 – refer to PHYS 339

PHYS 221	CRN 18011	RELATIVITY AND QUANTUM PHYSICS	15 PTS	2/3
Prerequisites:		MATH 142, 151, PHYS 114		
Restrictions:		PHYS 214		

Provides students with an understanding of the theory of special relativity, the foundations of quantum mechanics and its application to atoms, nuclear physics, and an introduction to the key concepts of elementary particles, general relativity and astrophysics.

PHYS 222	CRN 18012	ELECTRONS AND PHOTONS	15 PTS	1/3
Prerequisites:		(MATH 142, 151) or ENGR 122; PHYS 114; (ENGR 142 or PHYS 115)		
Restrictions:		PHYS 214, 215		

PHYS 222 deals with a variety of topics related to electronic and optical properties of materials. These include AC and LRC circuit theory, electronic devices, geometrical and physical optics, optical spectra and lasers.

PHYS 223	CRN 18013	CLASSICAL PHYSICS	15 PTS	1/3
Prerequisites:		MATH 142, 151, PHYS 114, 115		
Restrictions:		PHYS 215		

An introduction to classical physics at an intermediate level, in particular classical mechanics and thermodynamics.

300-LEVEL COURSES

PHYS 304	**CRN 1198**	**ELECTROMAGNETISM**	**15 PTS**	**2/3**
Prerequisites:		MATH 243, PHYS 222, 223		

Electromagnetism using vector calculus methods. Topics covered include electrostatics, (including methods of solution for Laplace's equation), dielectrics, magnetostatics, magnetic materials, induction, electrodynamics, Maxwell's equations and plane electromagnetic waves.

PHYS 305	**CRN 1199**	**THERMAL PHYSICS**	**15 PTS**	**1/3**
Prerequisites:		MATH 243, PHYS 223		

A development of statistical mechanics, thermodynamics, and heat propagation. The Fermi-Dirac, Bose-Einstein, and classical distributions are derived and illustrated with examples taken from thermal radiation, solid state physics, astrophysics and chemical physics.

PHYS 307	**CRN 1201**	**QUANTUM PHYSICS**	**15 PTS**	**1/3**
Prerequisites:		MATH 243, PHYS 221, 222		

Quantum theory, including orbital and spin angular momentum. Quantum systems including the hydrogen atom, vibrational and rotational states of molecules, the deuteron.

PHYS 309	**CRN 7608**	**SOLID STATE AND NUCLEAR PHYSICS**	**15 PTS**	**2/3**
Prerequisites:		MATH 142, 151, PHYS 221		
Restrictions:		ECEN 330		

Topics to be covered will include the electronic properties of solid materials, the physics of electronic devices (diodes, transistors, field effect transistors) and nuclear physics with an emphasis on the development of basic theory and some applications to materials science, environmental science and medicine.

PHYS 339	**CRN 1207**	**EXPERIMENTAL TECHNIQUES**	**15 PTS**	**1/3**
Prerequisites:		One course from PHYS 217, 221, 222, 223		

A lecture and laboratory based course covering vacuum, optical, cryogenic, electrical and data analysis techniques for experimental physics, and their theoretical background.

From 2019 this course can be taken in lieu of PHYS 217

PHYS 343	**CRN 18317**	**TOPICS IN APPLIED PHYSICS**	**15 PTS**	**2/3**
Prerequisites:		30 200-level PHYS points		

Students will study four different topics in applied physics. Topics may include: heat and the global greenhouse; fluids; percolation and pollution management; medical imaging techniques; solar technology; wind and wave energy resources; weather systems and climate change; applications of opto-electronic devices; applications of nuclear physics; physics education.

WHO TO CONTACT

STUDENT AND ACADEMIC SERVICES—FACULTY OF SCIENCE

Te Wāhanga Pūtaiao
Address: Level 1, Cotton Building
Phone: 04-463 5101
Email: **science-faculty@vuw.ac.nz**
Website: **www.victoria.ac.nz/science**
Hours: 8.30am–4.00pm Monday, Wednesday, Thursday, Friday
9.30am–4.00pm Tuesday

At the Faculty of Science Student Administration Office, student advisers can help with admission requirements, degree planning, changing courses and transfer of credit from other tertiary institutions. They also deal with other aspects of student administration such as enrolment, exams organisation and the maintenance of student records.

Student Advisor	Email	Contact
Varsha Narasimhan	varsha.narasimhan@vuw**.ac.nz**	04-463 5983
Cristina Sebold	cristina.sebold@vuw**.ac.nz**	04-463 5981
Annemarie Thorby	annemarie.thorby@vuw**.ac.nz**	04-463 7473
Emma Thornbury	emma.thornbury@vuw**.ac.nz**	04-463 5799

Johan Barnard	Manager, Student and Academic Services	04-463 5980
Kevin Gould	Associate Dean (Academic Undergraduate)	04-463 6649 or 04-463 5101

SCHOOL STAFF CONTACTS

		Room	Contact
Head of School	A/Prof Martyn Coles (till end of 2019)	LB406a	463 6357
Deputy Head of School	A/Prof Ben Ruck	LB506	463 5089
School Manager	Kara Eaton	LB406	463 5946 027 564 5946
General Enquiries	Joyce Lan	LB103	463 5335
Chemistry Enquiries			
Undergraduate 100-level	Dr Suzanne Boniface	LB104	463 6485
Undergraduate 200 and 300-levels	Dr Matthias Lein	LB503	463 5334
BSc(Hons) and MSc Part 1	Prof John Spencer	LB403	463 5119
MSc Part 2 and PhD	A/Prof Mattie Timmer	LB505	463 6926
Physics Enquiries			
Programme Director	A/Prof Gillian Turner	LB521	463 6478
Deputy Programme Director	Prof Uli Zuelicke	LB413	463 6851
BSc(Hons) and MSc Part 1	Prof Michele Governale	402	463 5951
MSc Part 2 and PhD	A/Prof Petrik Galvosas	LB308	463 6062
Laboratory Operations Manager	Dr Gordon Heeley	LB108a	463 5955 021 130 1592

CHEMISTRY

Academic Staff	**Research Areas**	**Room**	**Contact**
Dr Suzanne Boniface	*Chemistry Education*	LB104	463 6485
A/Prof Martyn Coles	*Catalysis, main group chemistry, hydrogen-bonded materials*	LB406a	463 6357
Dr Nathanial Davis	*Photophysics and solar energy, nanocrystals, organic chromophores, up and down conversion, light harvesting antenna complexes*	AM206	463 5233 ext 7134
Dr J. Robin Fulton	*Inorganic synthesis and mechanisms, environmental chemistry*	LB514	463 9799
Dr Renee Goreham	*Bio-inspired nanoclusters and bio-derived nanoparticles*	AM202	463 5591
Dr Joanne Harvey	*Total synthesis, design and synthesis of natural product analogues, organic reaction methodology*	AM207	463 5956
A/Prof Justin Hodgkiss	*Ultrafast laser spectroscopy, conjugated polymers, organic solar cells*	LB409	463 6983
Prof James Johnston	*Applied chemistry; new materials, nano-structured and nano-hybrid materials, new products and technology development and commercialisation*	LB303	463 5334
Dr Rob Keyzers	*Natural products, food and wine chemistry, NMR spectroscopy and mass spectrometry*	AM208	463 5117
Dr Matthias Lein	*Computational and Theoretical chemistry*	LB505	463 6926
Prof Thomas Nann	*Physical chemistry, Nanomaterials for energy conversion and storage*	LB510	463 5804
Prof Emily Parker	*Enzyme-catalysed reactions*	LB312	463 9055
Prof John Spencer	*Organometallic chemistry*	LB403	463 5119
A/Prof Bridget Stocker	*Immunoglycomics, bio-organic, green chemistry*	LB508	463 6481
A/Prof Mattie Timmer	*Immunoglycomics, design and synthesis of glyconjugate probes*	LB507	463 6529
Emeritus Professors			
E/Prof Neil Curtis		LB405	463 6514
E/Prof Brian Halton		LB405	463 5954

PHYSICS

Academic Staff	Research Areas	Room	Contact
Dr Baptiste Auguie	*Nano-optics and spectroscopy*	LB522	463 5547
Dr Stephen Curran	*Astrophysics*	LB504	463 6109
A/Prof Petrik Galvosas	*NMR methodologies for molecular dynamics in soft matter and porous material, NMR instrumentation*	LB308	463 6062 /5911
Prof Michele Governale	*Theoretical condensed-matter physics, quantum transport in nanoscale systems*	LB402	463 5951
Dr Malcolm Ingham	*Environmental physics, geophysics*	LB515	463 5216
Prof Eric Le Ru	*Electromagnetism, fluorescence and Raman spectroscopy*	LB205	463 5233 ext. 7509
Dr Franck Natali	*Novel materials for electronic and optoelectronic applications*	LB516	463 5964
Dr Yvette Perrott	*Astrophysics*	LB523	tbc
Dr Natalie Plank	*Electronic device properties of nanomaterials*	LB503	463 5031
Dr Andrew Ross	*Physics Education*	LB204	463 5819
A/Prof Ben Ruck	*Experimental condensed matter physics*	LB506	463 5089
A/Prof Gillian Turner	*Geophysics, geomagnetism, palaeomagnetism*	LB521	463 6478
Prof Ulrich Zuelicke	*Theoretical condensed-matter physics, nano-electronic transport and spin-electronic devices, cold-atoms systems*	LB413	463 6851
Professorial Research Fellow			
Dr Grant Williams	*Superconductors, magnetic nanoparticles, spin transport electronics, radiation detection and imaging, and nonlinear optics*	LB502	463 5544
Emeritus Professors			
E/Prof Alan Kaiser	*Electronic properties of novel materials, esp. nanoscale materials*	LB511	463 5957
E/Prof John Lekner	*Electrodynamics, quantum theory, fluid mechanics. Theory of reflection of waves*	LB519	463 5949
E/Prof Joe Trodahl	*Ferromagnetic semiconductors for spintronics, ferroelectric oxides, heat flow in sea ice*	LB516	463 5964