2020

Postgraduate Course list

Geography, Environment and Earth Sciences

Te Kura Tātai Aro Whenua

Glacial Valley at Dusk: 2017 Mirjam Schindler

Location:	Administration Office: Cotton Building, Room 311
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STAFF CONTACTS

In most instances, staff can be reached at firstname.lastname@vuw.ac.nz

		ROOM	PHONE
Head of School:	Prof James Renwick	309	463 4719
Deputy Head of School:	Dr Monica Handler	417	463 5391
PROGRAMME DIRECTORS			
Geography (GEOG, PHYG, ENVI, ENSC, DEVE, GISC, CCSP)	Prof Rewi Newnham	200	463 5279
Earth Sciences - (ESCI, GEOL, GPHS, MET)	Dr Cliff Atkins	302c	463 6143
POSTGRADUATE COORDINATORS			
Environmental Studies	A/Prof Ralph Chapman	212	463 6153
Environmental Sciences	Dr Lynda Petherick	207	463 5844
Human Geography	Prof Sara Kindon	213	463 6194
Physical Geography	A/Prof Kevin Norton	202	463 6993
Development Studies	Prof John Overton	209	463 5281
Geographic Information Science	Dr Mairéad de Róiste	215	463 6431
Geophysics	Prof Martha Savage	529	463 5961
Meteorology	Dr Jim McGregor	530	463 5278
Climate Change Science & Policy	Dr Alex Lo	128	463 5058
Earth Sciences	Prof Colin Wilson	411	463 9510
SCHOOL ADMINISTRATORS			
School Manager	Monika Hanson	310	463 5345
Administrator - Operations	Emma Fisher	311	463 5346
Programme Administrator - ESCI	Steff Marinus	311	463 5337
Programme Administrator - GEOG	Lewis Munn	311	463 6158
Postgraduate Administrator	TBC	311	463 6108

ACADEMIC STAFF

Dr	Wokje	Abrahamse	*Environmental studies, human dimensions of environmental issues, behaviour change, urban sustainability*	203	463 5217
Dr	Cliff	Atkins	*Sedimentary processes and environments, Antarctic glacial geology*	302c	463 6143
A/Prof	Ralph	Chapman	*Environmental studies, climate change, energy, transport, housing, urban, design, environmental health*	212	463 6153
Prof	James	Crampton	*Biodiversity history, mollusc taxonomy, morphometrics, traditional and quantitative biostratigraphy, cretaceous stratigraphy, basin evolution and history of New Zealand*	214	463 8396
Dr	Mairéad	de Róiste	*Usability, GIS, transport, modelling, e-democracy*	215	463 6431
Dr	Shaun	Eaves	Lecturer in Physical Geography	521	463 5176
Dr	Monica	Handler	*Geochemistry, mantle processes, volcanic rocks, Earth formation*	417	463 5391
A/Prof	Michael	Hannah	*Biostratigraphy, marine biostratigraphy, dinoflagellates; cretaceous/tertiary*	306	463 5494
Dr	Huw	Horgan	*Glaciology; ice-sheet stability, ice-shelf mass balance. Active source seismology*	520	463 9592
Dr	Jamie	Howarth	*Proxy records of environmental change, hazards, storm frequency*	224	463 5071
A/Prof	Bethanna	Jackson	*Hydrology; ecosystem service modelling; predicting impacts of land management*	208	463 6116
Prof	Sara	Kindon	*Social and development geography, participatory research, visual methods, gender, refugee resettlement*	213	463 6194
A/Prof	Simon	Lamb	*Structural geology and tectonics*	525	463 6428
Dr	Jim	McGregor	*Meteorology*	530	463 5278
Prof	Warwick	Murray	*Social and economic geography of development, globalisation, Latin America, Oceania, Asia-Pacific*	211	463 5029
Prof	Rewi	Newnham	*Quaternary climate and environmental change, palynology and vegetation history*	200	463 5279
A/Prof	Kevin	Norton	*Geomorphology*	202	463 6993
Prof	David	O'Sullivan	*Urban geography, novel geographic methods, spatial analysis, GIS*	227	463 6492
Prof	John	Overton	*Development studies, theories of development, land tenure, rural transformations*	209	463 5281
Dr	Marcela	Palomino-Schalscha	*Social and cultural geography, post-development and postcolonial approaches, diverse and solidarity economies, tourism and its connections to development and environmental issues, political ecology, Latin America, Indigenous knowledge's and rights*	210	463 5899
Dr	Lynda	Petherick	*Quaternary climate and environmental change, palynology and vegetation history, sedimentology and aeolian processes*	207	463 5844
Dr	Andrew	Rees	*Paleoecology*	214	463 9396
Prof	James	Renwick	*Climate; climate variability, climate change, climate modelling, climate*	309	463 4719

			prediction, New Zealand climate, El Niño-Southern Oscillation (ENSO), teleconnections, atmospheric blocking, Antarctic sea ice, multivariate statistical analysis		
Prof	Martha	Savage	*Seismology and its relation to tectonics, volcanoes, earthquake hazards and geothermal energy*	529	463 5961
Dr	Mirjam	Schindler	*Urban geography, human-environment interactions, spatial analysis, urban modelling*	204	463 5645
Dr	Ian	Schipper	*Igneous Petrology and Volcanology*	415	463 8197
Prof	Terry	Seward	*Chemistry and geochemistry of aqueous fluids elevated temperatures and pressures at conditions relevant to those found in the earth's crust*	416	463 5814
Dr	Dan	Sinclair	*Environmental geochemistry, paleoclimatology, paleoceanography, rapid climate change during the last glacial, geochemistry of carbonates, speleothems and corals; biomineralization*	419	463 9755
Prof	Tim	Stern	*Exploration geophysics and tectonics, crust and mantle structure of the earth*	526	463 5112
Dr	Polly	Stupples	*Social and cultural geography, development studies, creative practice and the creative economy, sustainability*	221	463 6793
Prof	Rupert	Sutherland	*Global-scale tectonic process and crustal- scale tectonic processes*	527	463 6422
Dr	Amanda	Thomas	*democracy, environmental democracy, political ecology, gender, class and ethnicity*	201	463 6117
Prof	John	Townend	*Fault mechanics and tectonophysics*	309	463 5411
Dr	Julie	Vry	*Metamorphic petrology, geochemistry*	409	463 6432
Prof	Colin	Wilson	*Field, chemical and physical volcanology, super-volcanoes, pyroclastic deposits, volcano-tectonics, and geothermal geology*	411	463 9510

SENIOR TUTORS

Mr	Dene	Carroll	Senior Tutor - ESCI	302c	463 5932
Mr	Pascarn	Dickinson	Senior Tutor - GEOG	222	463 8030

ANTARCTIC RESEARCH CENTRE

Dr	Brian	Anderson	Senior Research Fellow	521	463 5176
Prof	Peter	Barrett	Emeritus Professor	515	463 5336
A/Prof	Nancy	Bertler	Antarctic Science Platform Director	519	463 6196
Dr	Ruzica	Dadic	Senior Research Fellow	510	463 6199
Dr	Warren	Dickinson	Senior Research Fellow	510	463 6199
Ms	Michelle	Dow	Centre Manager	512	463 6587

Dr	Gavin	Dunbar	Senior Lecturer	518	463 6123
Dr	Shaun	Eaves	Lecturer in Physical Geography	521	463 5176
A/Prof	Nick	Golledge	Senior Research Fellow	509	463 9592
Dr	Huw	Horgan	Senior Lecturer	520	463 6918
A/Prof	Richard	Levy	Associate Professor	519	463 6196
Mr	Darcy	Mandeno	Field and Operations Engineer	513	463 9662
Dr	Rob	McKay	Director	517	463 6836
Prof	Tim	Naish	Professor in Earth Sciences	508	463 6197

CLIMATE CHANGE RESEARCH INSTITUTE

Prof	Dave	Frame	Director	127	463 6790
Dr	Judy	Lawrence	Adjunct Research Associate	129	463 5474
Dr	Alex	Lo	Senior Lecturer in Climate Change	128	463 5058

EMERITUS PROFESSORS/ ADJUNCT STAFF

Dr	Kelli	Archie	*Adjunct Research Fellow*	Off campus	
E/Prof	Michael	Crozier	*Physical geography*	Off campus	
E/Prof	John	Gamble	*Igneous petrology, petrogenesis, volcanology*	421B	463 5253
E/Prof	Philip	Morrison	*Quantitative Geography*		
Prof	Diane	Seward	*Low temperature thermochronology, Fission- track analysis, (U-Th-Sm)/He analysis with applications in tectonics, structural geology, basin analysis, landscape evolution*	416	463 5814
E/Prof	Euan	Smith	*Seismology, earthquake occurrence, earthquake mechanics, earth deformation, seismic hazard*	Off campus	
E/Prof	Richard	Walcott	*Global tectonics, continental deformation*	Off campus	
Prof	Lionel	Carter	*Marine Geology*	507	463 6475

TECHNICAL STAFF

Mr	Kosta	Tashkoff	Manager Technical Services	307	463 6013
Dr	Luisa	Ashworth	Analytical Facilities Technician	414	463 6402

Mr	Aleksandr	Beliaev	Computing Systems Administrator	502	463 6470
Dr	Bruce	Charlier	Geochemistry Laboratory Manager	414	463 5865
Ms	Jane	Chewings	Senior Technical Officer - Sedimentology	319	463 6192
Mr	Andrew	Rae	Technician – GIS Support	502	463 6470
Mr	Dez	Tessler	Field Technical	318	463 6512
Ms	Cassandra	Trinh-Le	Technician – Geophysics	318	463 8036
Ms	Fiona	Tuckett	Technician – Petrology	319	463 9479
Ms	Ningsheng	Wang	Senior Technical Officer - Luminescence Lab Coordinator	414	463 6127

POSTGRADUATE PROGRAMMES

The diagram below represents the structure of postgraduate study in science.

3-year BSc/BA 1-2 year GDipSc

1-year Hons/PGDip/ Master's Part 1 Taught courses

1-year Master's Part 2 Thesis

3-4-year PhD

The following qualifications are available within the School's programmes:

- Bachelor of Arts with Honours (BA(Hons)) in Geography
- Bachelor of Science with Honours (BSc(Hons)) in Geography, Geology, Geophysics or Physical Geography
- Graduate Diploma in Science (GDipSc)
- Postgraduate Certificate in Science (PGCertSc)
- Postgraduate Diploma in Science (PGDipSc) in Geography, Geology, Geophysics, or Physical Geography
- Postgraduate Diploma in Arts (PGDipArts)
- Postgraduate Diploma in Development Studies (PGDipDevStud)
- Postgraduate Diploma in Environmental Studies (PGDipEnvStud)
- Postgraduate Diploma in Geographic Information Science (PGDipGIS)
- Postgraduate Diploma in Meteorology (PGDipMet)
- Master of Science (MSc) in Geography, Geology, Geophysics or Physical Geography (Parts 1 and 2)
- Master of Arts (MA) by thesis in Geography (Part 2 only)
- Master of Science (MSc) by thesis in Geography, Geology, Geophysics or Physical Geography (Part 2 only)
- Master of Climate Change Science and Policy (MCCSP)
- Master of Development Studies (MDevStud)
- Master of Environmental Science (MEnvSc)
- Master of Environmental Studies (MEnvStud)
- Master of Geographic Information Science (MGIS)
- Master of Meteorology (MMet)
- PhD in Development Studies, Environmental Studies, Geographic Information Science, Geography, Geology, Geophysics or Physical Geography

DOCTOR OF PHILOSOPHY

The PhD is the highest degree offered, and usually takes three to four years to complete. It is an internationally recognised research degree and opens rich and varied career opportunities. Students should contact the Faculty of Graduate Research (FGR) www.victoria.ac.nz/fgr to enrol.

Formal assessment of the PhD degree is by means of a thesis and an oral examination, but progress reports and seminars are also required during the course. Students must have a BSc(Hons), Masters, or equivalent degree, and must have the agreement of a supervisor to be admitted to the PhD programme.

CLIMATE CHANGE SCIENCE AND POLICY

Climate change is without a doubt the biggest environmental challenge our world is facing. Globally we are already encountering some of the negative consequences - an increase in extreme weather events, concerns about food security, species loss and threats to biodiversity, and the loss of habitable land.

The need to keep global warming well below a 2-degree threshold to prevent even more serious impacts is well-established. How we go about reducing our emissions, and how we adapt to changes that have already happened, requires scientists and policy-makers with a broad understanding of both the physical science and human systems that are involved.

The 180-point Master of Climate Change Science and Policy (MCCSP) responds to this need by providing a cross-disciplinary programme which combines taught courses with a research essay or placement into an external organisation, giving students the necessary combination of policy and science knowledge to address the real-world problem of climate change.

The MCCSP provides students with understanding about the physical nature of global climate change, the ethical, scientific and policy strengths and weaknesses of current and proposed strategies for tackling climate change, and the political forces working for – and against – addressing this challenge. Students gain insight into the economics, politics, communication, behavioural science and public engagement critical to developing strategies to mitigate and adapt to its impacts at local, national and global scales. Our proximity to— and close relationships with—relevant government bodies, research institutes and other key agencies in climate change science and policy, ensure students are exposed to a wide range of expertise from across the university and from visiting experts.

Who should apply?
The Master of Climate Chance Science and Policy is ideal for science graduates who are interested in working in policy, iwi development or NGO advocacy related to climate change, and graduates from other disciplines such as law, engineering or social science who want to gain the scientific knowledge of climate-change that will give them an edge in their career.
You will need to have a three-year degree in a relevant subject, with a B+ average at 300 level, from any New Zealand university. Students with equivalent international qualifications or extensive and relevant practical, professional or scholarly experience are encouraged to apply, although admission to the programme is at the discretion of the Associate Dean – Academic (Postgraduate).

Programme Structure
The MCCSP is a taught Master's degree that can be completed in one year of full-time study or up to three years of part-time study. The programme starts in Trimester One.

Part One
Part One is a flexible programme of taught courses. Students will complete four compulsory core courses (totaling 60 points) which will develop a broad understanding of the issues relating to climate change, and 3 – 4 elective courses (totaling 60 points) related to your area of focus.

Part Two
In Part Two you'll complete either:
CCSP 510 Research Essay: This major research project gives the student scope to investigate a climate related topic of interest, and centers on writing and presenting an extended research essay of up to 15,000 words. (60 points)
Or CCSP 511 Practicum Placement and Project: The placement is a period of work with an employer in the field of climate change science, policy or management including the completion of a short research project. (60 points)

400-LEVEL CLIMATE CHANGE SCIENCE AND POLICY COURSES

Course Code	Course Registration Number	Course Name	Points	Trimester Available

CCSP 401	**CRN 30159**	**PHYSICAL BASIS OF CLIMATE CHANGE**	**15 PTS**	**1/3**

Assessment: Internal assessment

Coordinator: Prof James Renwick

Learn about the physical climate science dimensions of climate change, including concepts of climate forcing, feedback and response, and the relationship between emissions and concentrations.

CCSP 402	**CRN 30160**	**CLIMATE CHANGE IMPACTS AND ADAPTATION**	**15 PTS**	**1/3**

Assessment: Internal assessment

Coordinator: Dr Alex Lo

Gain a high-level understanding of climate change impacts and adaptation at global, national and local scales. Climate prediction models will be used to examine social and biophysical vulnerabilities to environmental change, and explore policies and measures to minimise impacts, and the potential for adaptation at different scales.

CCSP 403	**CRN 30161**	**INTERNATIONAL CLIMATE CHANGE POLICY**	**15 PTS**	**2/3**

Assessment: Internal assessment

Coordinator: Prof Dave Frame

Consider international climate policy, drawing on policy-relevant physical climate change science, economics, game theory, ethics and international relations. Learn about the history, theory and prospects of landmark efforts to govern climate change, domestically and internationally.

CCSP 404	**CRN 30162**	**CLIMATE CHANGE MITIGATION**	**15 PTS**	**2/3**

Assessment: Internal assessment

Coordinator: A/Prof Ralph Chapman

Examine the domestic and international policy issues surround climate change mitigation, including why mitigation represents a challenging social and economic, and well as environmental, problem. Consider differing perspectives and their links to international policy, the role of relevant institutions, policy communication and behavior change.

Co-taught with ENVI528.

CCSP 510	**CRN 30163**	**RESEARCH ESSAY**	**60 PTS**	**3/3**

Assessment: Internal assessment
Coordinator: Dr Alex Lo

This major research project gives the student scope to investigate a climate related topic of interest, and centers on writing and presenting an extended research essay of up to 15,000 words.

CCSP 511	**CRN 30164**	**PRACTICUM**	**60 PTS**	**3/3**

Assessment: Internal assessment
Coordinator: Dr Alex Lo

Practicum Placement and Project: The placement is a period of work with an employer in the field of climate change science, policy or management including the completion of a short research project.

DEVELOPMENT STUDIES

Development Studies programmes examine the theories and practices associated with inequalities in world development, using multi-disciplinary approaches.

Attention is paid to the relationships between 'developed' and 'developing' societies, the roles played by various institutions within them and their effects on processes of social, political, economic and environmental transformation.

Our programmes are accessible to graduates from a wide range of disciplines and occupations. People with work experience in community and international development are strongly encouraged to apply, especially those with a background in the Asia Pacific region. Students are encouraged to spend some time overseas in a developing country as part of their postgraduate study and Master's students usually complete a research thesis based on work in a developing country.

POSTGRADUATE DIPLOMA IN DEVELOPMENT STUDIES

The Postgraduate Diploma in Development Studies (PGDipDevStud) is a full-time programme taken over the course of one year, without a thesis component. It is open to those already in the workforce who wish to augment or update their skill-base, or recent graduates wishing to broaden their undergraduate degree.

Entry requirements: The minimum entry qualification is a BA or BSc with an average grade of B or higher in relevant 300-level courses.

All students are urged to plan their course of study with the Director of Development Studies, Prof John Overton, before enrolment. Part time enrolment is possible.

The course of study for the PGDipDevStud consists of DEVE 511, 512, 513, 514 and 60 further points from approved 400- or 500-level courses as discussed with the Director.

MASTER OF DEVELOPMENT STUDIES

To complete the Master of Development Studies (MDevStud), a student must undertake 240 points of study over two years if studying full-time. Part 1 (the first year) comprises taught courses (DEVE 511-514, and 60 further approved points). Part 2 consists of a thesis (DEVE 592) worth 120 points.

Students begin their thesis following submission and acceptance of a full research proposal as part of their work for the DEVE 514 Development Research course in the second trimester of their Part 1 year.

All students are urged to plan their course of study with the Director of Development Studies before enrolment. Part time enrolment is possible.

The MDevStud course of study consists of: **Part 1:** DEVE 511, 512, 513, 514 and 60 further approved points from the approved courses as discussed with the Director.

Part 2: DEVE 592 (Thesis) **Requirements:** An average of B+ grades across Part 1 courses is expected. The thesis is a maximum of 40,000 words (120-150 pages) and must be completed by two years following the year of first enrolment.

PHD IN DEVELOPMENT STUDIES

The PhD in Development Studies usually takes three to four years to complete.

500-LEVEL DEVELOPMENT STUDIES COURSES

Course Code	Course Registration Number	Course Name	Points	Trimester Available
DEVE 503	**CRN 17050 CRN 17304 CRN 9236**	**PRACTICUM**	**30 PTS**	**2+3/3 3+1/3 1+2/3**

Assessment: Internal assessment

Coordinator: Prof John Overton

The practicum consists of supervised practice in a field of development management focusing attention on the interface between policy and practice. The student selects a workplace where development practices can be assessed. The student submits a proposal of the intended workplace to the course coordinator and keeps an account of the hours spent on practical work with that organisation. At the end of the practicum, the student writes a research essay, which places the practical experience in the light of relevant development theories. Opportunities can be explored through Volunteer Wellington, through the Council for International Development or other NGOs and suitable development agencies.

DEVE 511	**CRN 15920**	**DEVELOPMENT THEORY**	**15 PTS**	**1/3**

Coordinator: Prof John Overton

This course aims to introduce students to the wide range of theories about development that have appeared over the past 60 years and more. It involves an examination of 'development' and its various interpretations as well as its theoretical and ideological underpinnings. The course will cover the evolution of ideas about development and span a broad range of thinking about development and related concepts such as poverty, underdevelopment and inequality.

Topics covered include Western and non-Western perspectives and the historical context of development, market-based development theories, radical theories of dependency and world systems, alternative development including participation, gender and sustainability, and post development theories. Throughout, the links between development theory and policy will be explored.

DEVE 512	**CRN 15921**	**DEVELOPMENT PRACTICE**	**15 PTS**	**2/3**

Coordinator: Prof John Overton

DEVE 512 has two main aims. Firstly, it aims to construct a framework of critical issues for practice. Acknowledging the intimate connections between material and discursive processes in development, this course explores issues of ethics, power relations, and underlying assumptions and values that influence the practice of development, also introducing students to the 'institutional landscape' of development. Secondly, the course aims to lead students through the main elements of project cycle management and the principle issues and techniques used in managing development projects. Here topics and techniques such as project proposals, analysis, planning, implementation, monitoring and evaluation are covered.

DEVE 513	CRN 15922	DEVELOPMENT POLICY	15 PTS	1/3

Coordinator: Prof John Overton

This course aims to cover the basic elements of development policy formulation using a 'hands-on' approach and practical work in policy development. The emphasis in this course is on developing an example of policy formulation, involving policy documents, role play negotiations, and group work. Although a fictitious country will be used as the context for study, real documents will be used, and practical work will result in a draft policy statement for the country. In this course students will be expected to work in groups and participate fully in discussions, role plays and writing exercises. There is an emphasis on oral presentation skills alongside written work. Topics covered include poverty reduction strategy papers (PRSPs), international policy frameworks (e.g. MDGs), donor agency policies, multi-donor harmonisation and alignment, domestic policy frameworks of government departments, local governments and NGOs, and issues of disbursement and monitoring.

DEVE 514	CRN 15923	DEVELOPMENT RESEARCH	15 PTS	2/3

Coordinator: Dr Marcela Palomino-Schalscha

This course aims to prepare students for thesis research. It covers some of the generic issues and skills involved in research, such as choosing a topic, research design, data collection and analysis, communication and report writing. It also examines some of the issues and techniques that are particularly relevant to development research such as fieldwork, field methods, research ethics and relationships with participants.

By the end of the course, students should:

- understand the nature and value of research
- understand the research process in terms of its main stages of planning, preparation; field research, data analysis, writing and presentation
- be aware of the importance of preliminaries - developing proposals, securing funding and mapping out (and later managing) budgets
- have a basic knowledge of epistemologies and methodologies, and the place of quantitative and qualitative research methods
- be aware of a range of appropriate field methods in working with different groups of human participants

Competence in the above will be demonstrated through the preparation of research plans, budgets and a detailed research proposal that will form the basis of Master's thesis research. DEVE 514 is co-taught with ENVI 521 and GEOG 580.

DEVE 540	CRN 17449 CRN 27291 CRN 17308 CRN 19973	DIRECTED INDIVIDUAL STUDY	15 PTS	1/3 1+2/3 2/3 3/3

Coordinator: Prof John Overton

This course provides students with the option of following a directed individual study, with the approval of the Head of School, and under the supervision of an academic staff member with appropriate expertise.

DEVE 560	**CRN 13963** **CRN 10252** **CRN 11346** **CRN 23174**	**SPECIAL TOPIC**	**30 PTS**	**1/3** **1+2** **2/3** **2+3**

Coordinator: Prof John Overton

This course provides the opportunity for a student to examine a particular aspect of development in more depth according to their own needs and interests. The student negotiates the topic with the Director of Development Studies or designated supervisor and together they devise a course of study and related assessment. In some cases, DEVE 560 may also be used to take a modified version of one of the undergraduate courses.

DEVE 561	**CRN 18784** **CRN 18697**	**SPECIAL TOPIC**	**30 PTS**	**2/3** **2+3**

DEVE 589	**CRN 6340**	**THESIS**	**120 PTS**	**F/Y**

DEVE 592	**CRN 11761**	**THESIS**	**120 PTS**	**F/Y**

Coordinator: Prof John Overton

This research-based thesis provides experience in research design, planning, implementation, analysis and representation with the assistance of an academic supervisor.

The thesis requires students to compile a bibliography of readings appropriate to their chosen topic, then integrate their knowledge of development ideas with practical field experience.

Each student is encouraged to consider their topic of interest and discuss it with the Director during the first year of their enrolment. A formal proposal is required to be submitted as part of the DEVE 514 coursework. The proposal will be considered by Development Studies staff before approval is given to proceed and supervision finalised. The proposal is also necessary so that the student can forward that proposal both for funding consideration and for ethics approval.

The final thesis produced should be between 120 and 150 pages in length (maximum of 40,000 words).

DEVE 690	**CRN 8293**	**Development Studies for PhD**		**F/Y**

ENVIRONMENTAL SCIENCE

Risks posed by climate change, sea level rise, and stresses on our natural resources highlight the need for environmental scientists and advisers.

Environmental Science is about understanding how humans connect with and change the natural environment and is taught through a range of scientific disciplines such as biology, chemistry, geography, mathematics, and physics.

Learn to assess environmental problems and protect and preserve our natural taonga through your choice of a postgraduate programme in Environmental Science.

Many of New Zealand's primary industries have an undeniable impact on the environment—agriculture, mining, forestry and fisheries all leave their mark on the planet we live on. Introduced predators pose threats to native wildlife and ecosystems.

As a Master of Environmental Science student, you'll spend time on the ground, doing fieldwork like monitoring the quality of waterways, soil or air. Gain an understanding of the tools and techniques that can help mitigate the human impact on the environment. And learn to analyse complex data sets, draw conclusions, and communicate scientific results to effect policy and regulatory change.

MAKE VALUABLE CONNECTIONS AND GAIN AN EDGE IN YOUR CAREER

Wellington is the ideal place for students to see environmental science in action, being surrounded by a diverse natural environment while also being the home of government. The Master of Environmental Science programme involves close interaction with city and regional councils as well as Zealandia eco-sanctuary, MetService, GNS Science, NIWA and many other organisations.

Environmental Science is an area of strategic opportunity for New Zealand. There is an increasing need for scientifically trained graduates able to influence environmental decision-making, and to facilitate the science–policy–practice nexus throughout government, private and community sectors.

Entry Requirements: Bachelor's degree with at least a B average in a relevant subject.

POSTGRADUATE CERTIFICATE AND DIPLOMA

If you complete Part 1 of the Master of Environmental Science and don't continue to Part 2, you'll be awarded a Postgraduate Diploma in Science (Environmental Science).

If you complete two core courses and one further course, you can be awarded a Postgraduate Certificate in Science (Environmental Science).

MASTER OF SCIENCE IN ENVIRONMENTAL SCIENCE BY COURSEWORK AND THESIS

The Master of Science in Environmental Science is a 240-point, two-year programme which includes more in-depth research in the form of a thesis.

Part 1 of the MSc in Environmental Science is very similar to Part 1 of the MEnvSc, with the addition of ESCI 580, a research preparation course.

If you complete Part 1 of the MEnvSc and then find you would prefer to pursue in-depth research, you can transfer to the MSc. And likewise, if you complete Part 1 of the MSc and find you'd prefer to undertake the research project or placement, you can transfer to the MEnvSc.

Programme requirements:

Complete 180 points
Include the following courses in Part 1:
Advanced Topic in Environmental Science (ENSC 401)

Perspectives in Environmental Science in Aotearoa New Zealand (ENSC 402)
Environmental Science Research Essay (ENSC 485)

Further 60 points from: BIOL401-431, CCSP401, CCSP402, CHEM421-423, ENSC410-421, ENVI520, ESCI403-416, GPHS 441-448, PHYG413-423, PHYS415-447, STAT431-452

Include Environmental Science Research Project (ENSC 510) or Environmental Science Placement and Project (ENSC 511) in Part 2

ENSC401	**CRN 31068**	**Advanced Environmental Science**	**30 points**	**1**

Course Coordinator: Dr Andrew Rees

This course develops field and lab skills, with a strong focus on environmental monitoring at Zealandia. Students will assess methodologies from published literature and apply relevant techniques to collected data, developing scientific, analytical and mathematical skills that can be extrapolated to key environmental problems.

ENSC402	**CRN 31068**	**Perspectives in Environmental Science in Aotearoa New Zealand**	**15 Points**	**1**

Course Coordinator: Dr Lynda Petherick

The Earth is facing escalating pressures on the environment. In this interdisciplinary science course, students will explore contemporary and controversial environmental issues facing New Zealand. The course will be lecture-and seminar- based, with external guest-speakers offering their perspectives on the state of the environment in New Zealand. Students will gain experience and skills of engagement with various stakeholders.

ENSC410	**CRN 31070**	**Environmental Science Internship**	**15 points**	**2**

Course Coordinator: Dr Lynda Petherick

This course enables students to gain professional work experience in environmental science. Each student is supervised by a host organisation involved in environmental science research or applications in the public or private sectors. The placement allows students to further develop teamwork and communication skills, with production of a report and presentation.

ENSC485	**CRN 31073**	**Environmental Science Research Essay**	**15 points**	**2**

Course Coordinator: Dr Lynda Petherick

This course develops skills in research and writing in Environmental Science. A review essay will be written on a relevant topic in environmental science, with the supervision of a Victoria academic or an expert from a collaborative institute. The review is expected to meet the conventions of a scholarly outlet. The review findings will be summarised in a blog, suitable for non-experts.

ENSC510	**CRN 31074**	**Environmental Science Research Project**	**60 points**	**3**

Course Coordinator: Dr Lynda Petherick

This major research project gives the student scope to investigate an environment-related topic of particular interest, and centres on writing and presenting an extended research essay of up to 15,000 words. The investigation will relate to an independent research question concerning an aspect of environmental science. It will consist of a review of the literature, some primary research and analysis, and the leading of a seminar to share understanding of the project's outcomes with fellow students.

ENSC511	**CRN 30175**	**Environmental Science Placement and Project**	**60 points**	**3**

Course Coordinator: Dr Lynda Petherick

This course provides both professional development and research training. It has three components: a placement, an applied research project, and presentation of a seminar. The placement is a period of work with an employer in the field of environmental science. The project aims to research a particular aspect of the work undertaken to enrich the student's knowledge of the organisation's work. The seminar aims to share understanding among fellow students of the role of the organisation.

ENSC591	**CRN 31140**	**Thesis in Environmental Science**	**120 points**	**F/Y**

Course Coordinator: Dr Lynda Petherick

ENVIRONMENTAL STUDIES

Environmental Studies tackles challenging issues such as what motivates people to act in an environmentally friendly way and how policy changes can best protect our environment. Placed alongside Geography and Development Studies, Environmental Studies connects naturally to Public Policy, Law and Management, and is suitable for students with an interest in the environment, whether from a science, commerce or arts background.

Our capital city location facilitates work with government departments such as the Ministry for the Environment, as well as international agencies, industries, regional and local government, Iwi and environmental organisations. The School has particularly strong links to environmental policy agencies based in Wellington and, within the university, the Environmental Studies programme maintains close links with the New Zealand Climate Change Research Institute.

POSTGRADUATE DIPLOMA IN ENVIRONMENTAL STUDIES

The Postgraduate Diploma in Environmental Studies (PGDipEnvStud) is a full-time programme taken over two trimesters (1 and 2), without a thesis. This qualification requires the completion of 120 points of coursework including two 15-point core courses (ENVI 520 and 521) and 90 points from ENVI 522-530. Up to 30 of these points may be replaced by approved 400 or 500-level courses as discussed with the Director.

Entry requirements: BA or BSc with an average grade of B or higher in relevant 300-level courses. All students are urged to plan their course of study with the Director of Environment Studies, A/Prof Ralph Chapman, before enrolment. Applications for the PGDipEnvStud must be received by 31 January for the year of study. Part time enrolment is possible.

MASTER OF ENVIRONMENTAL STUDIES

The Master of Environmental Studies (MEnvStud) is open to those already in the workforce who wish to augment or update their skill-base, or recent graduates wishing to broaden their undergraduate degree. Part 1 ensures you have a grounding in the basics. In Part 2 you will undertake a one-year full-time (or two-year part-time) thesis in an area of environmental or resource management expertise that will prepare you for your chosen career path.

The MEnvStud course of study formally consists of:
Part 1: as with the Postgraduate Diploma course of study set out above
Part 2: ENVI 591 (120-point thesis), OR ENVI 593 (90-point thesis), combined with ENVI 512 Practicum or, for those with relevant work experience, a 30-point course chosen from the courses listed for Part 1 above.

Note:

- Enrolment in ENVI 593 or ENVI 591 will be for 12 months from the date of enrolment, or 24 months if part-time. Practical work is carried out in approved organisations under the personal supervision of practitioners approved by the Programme Director.
- Entry to Part 2 requires the acceptance of a thesis proposal by the Postgraduate Programme Director in Environmental Studies and either a B+ average from Part 1 courses or special permission from the Director. You are strongly advised to tailor your research proposal to the interests and expertise of staff in the programme.

PHD IN ENVIRONMENTAL STUDIES

The PhD in Environmental Studies usually takes three years to complete.

500-LEVEL ENVIRONMENTAL STUDIES COURSES

Course Code	Course Registration Number	Course Name	Points	Trimester Available
ENVI 512	**CRN 2074 CRN 17086 CRN 17087**	**PRACTICUM**	**30 PTS**	**1+2/3 2+3/3 3+1/3**

Coordinator: A/Prof Ralph Chapman

This is a supervised placement in a specialised field of environmental or resource management, focusing on practice in a particular organisation or agency. The placement is negotiated in consultation with the Director and organisation. The placement requires 200 hours of work, often unpaid (except in exceptional circumstances), and can be carried out over an extended period during the trimester or in more concentrated blocks during the non-teaching breaks. ENVI 512 includes seminars as needed for students to report back on key learning and to share with other students. All the course requirements must be completed by the end of February in the year following enrolment in order to obtain a pass grade.

ENVI 520	**CRN 15675**	**ENVIRONMENTAL MANAGEMENT**	**15 PTS**	**1/3**

Coordinator: A/Prof Ralph Chapman

This course explores frameworks and issues in resource and environmental management, providing a broad overview of the field and underpinning further study in the other courses. Students are encouraged to take a critical view and to develop an understanding of relevant conceptual frameworks and how they are applied in practical environmental management. Environmental policy analysis and communications are considered. In addition to issues in current international environmental management, New Zealand frameworks for environmental management are explored. Readings are set for each class meeting and students are expected to contribute to the discussions through oral participation.

ENVI 521	**CRN 15676**	**RESEARCH METHODS FOR ENVIRONMENTAL STUDIES**	**15 PTS**	**2/3**

Coordinator: Dr Wokje Abrahamse

This course prepares students for thesis research. It covers some of the generic issues and skills involved in research, such as choosing a topic, research design, data collection and analysis, ethics, communication and report writing. It also examines some of the issues and techniques that are particularly relevant to environmental research such as fieldwork, field methods, research ethics and relationships with participants.

By the end of the course, students should:

- understand the nature and value of research
- understand the research process in terms of its main stages of planning, preparation; field research, data analysis, writing and presentation
- be aware of the importance of preliminaries - developing proposals, securing funding and mapping out (and later managing) budgets
- have a basic knowledge of epistemologies and methodologies, and the place of quantitative and qualitative research methods

- be aware of a range of appropriate field methods in working with different groups of human participants

Competence in the above will be demonstrated through the preparation of research plans, budgets and a detailed research proposal that will form the basis of Master's thesis research.
ENVI 521 is co-taught with DEVE 514 and GEOG 580.

ENVI 522	**CRN 17362**	**ENVIRONMENTAL AND PLANNING LAW**	**15 PTS**	**1/3**

Coordinator: Tom Bennion

This course offers a practical survey of the law, theories of law as they affect environmental management, the bearing of international law on New Zealand law, and how planning and environmental regulation happens under environmental law in New Zealand, especially the Resource Management Act 1991.

ENVI 524	**CRN 26075**	**ENVIRONMENTAL ECONOMICS FOR PUBLIC POLICY**	**15 PTS**	**1/3**

Coordinator: A/Prof Ralph Chapman

Introduces ecological economics, the environment as 'natural capital', and the economy vis-a-vis society/environment. Covers the mechanics and limitations of the market and government, private/collective choices and their impacts on the environment. Policy-oriented, with focus on relevant core microeconomic theory (market/non-market); heterodox/orthodox approaches; behavioral, institutional and ecological economics.

ENVI 525	**CRN 25034**	**MĀORI ENVIRONMENTAL AND RESOURCE MANAGEMENT**	**15 PTS**	

NOT RUNNING 2020

The course aims to build an understanding of Māori perspectives of the environment through an in- depth look at the complex interplay between social, political, environmental and cultural factors that impact on Aotearoa New Zealand's built and natural environments. The course considers the role Māori environmental perspectives could, and do, play in the creation of uniquely Aotearoa New Zealand places by drawing on case studies across Aotearoa New Zealand. Strategies and methods for ensuring the adequate consideration of these perspectives are evaluated.

ENVI 526	**CRN 17359**	**POLITICAL ECOLOGY OF CONSERVATION**	**15 PTS**	**1/3**

Coordinator: Dr Amanda Thomas

This course will explore the socio-political dimensions of conservation by critically considering the histories, knowledge, and broader political economies that shaped and shape conservation policies and practices. Particular focus will be placed on 1) unpacking assumptions we commonly have about conservation; and 2) examining how uneven relationships of power play out through different approaches to conservation.

ENVI 528	CRN 17358	CLIMATE CHANGE ISSUES	15 PTS	2/3

Coordinator: A/Prof Ralph Chapman

This course provides an examination of the domestic and international policy issues surrounding climate change mitigation, including why mitigation represents a challenging social and economic as well as environmental problem; differing perspectives on policy solutions to the mitigation challenge; linkages with international policy; policies and behaviour change; the roles of relevant institutions; sectoral considerations and policy measures; policy communication, and the politics of mitigation strategies.

Co-coded as CCSP404.

ENVI 529	CRN 17357	SPECIAL TOPIC: CONTEMPORARY URBAN ISSUES	15 PTS	1/3

NOT RUNNING 2020

This course focuses on how we might understand and respond to urban issues and problems. It takes a multi-disciplinary approach focusing on contemporary issues such as urbanisation, suburbanisation, urban sustainability, culture and space, gender and space and neighbourhood and community dynamics from both Aotearoa New Zealand and global perspectives.

ENVI 530	CRN 26076	SPECIAL TOPIC: DRIVERS OF HUMAN BEHAVIOUS	15 PTS	2/3

Coordinator: Dr Wokje Abrahamse

This course examines human behaviour in relation to environmental challenges. We will focus on individual drivers of behaviour, as well as understanding the ways in which (un)sustainable practices are situated within existing social, natural, technological and policy contexts. Through the analysis of case studies, students will gain a better understanding of how individuals can be encouraged to engage in environmentally friendly practices, and how behaviour change principles may be used to inform environmental policy and practice.

ENVI 591	CRN 23008	THESIS	120 PTS	F/Y

The ENVI 591 thesis provides an opportunity for students to further develop and demonstrate skills in a sustained piece of research. The 120-point thesis is a more research-intensive 'academic' option than the standard (ENVI 593) option combining a thesis and placement. The optimal thesis length is 30-40,000 words. The thesis topic is developed in consultation with an academic supervisor based on the development and acceptance of a research proposal through ENVI 521 in the preceding year. The thesis is due in one year (full time) from the date of enrolment in ENVI 591. Students are expected to participate in the academic life of the School including attending the Geography, Environment and Development (GED) Seminar Series.

ENVI 593	CRN 2077	THESIS	90 PTS	F/Y

The ENVI 593 thesis provides an opportunity for students to develop and demonstrate skills in a research project. The 90-point thesis represents around eight to nine months' full-time work and sits alongside the ENVI 512 Practicum (placement) course. The optimal thesis length is 20–25,000 words, with anything over 30,000 very strongly discouraged. The thesis topic is developed in consultation with an academic supervisor based on the development and acceptance of a research proposal in ENVI 521 in the preceding year. The thesis is due in one year (full time) from enrolment in ENVI 593. Students are expected to participate in the academic life of the School including attending the Geography, Environment and Development Seminar (GED) Series.

GEOGRAPHIC INFORMATION SCIENCE

The Postgraduate Certificate (PGCertGIS), Postgraduate Diploma (PGDipGIS), Master in Geographic Information Science (MGIS), and Master of Science in GIS (MScGIS) programmes are nationally and internationally recognised qualifications, and graduates with these qualifications are highly sought after. As well as having excellent research capability in GIS, VUW has excellent links with local GIS organisations such as Land Information New Zealand (LINZ), New Zealand Transport Agency (NZTA), and the Department of Conservation.

POSTGRADUATE CERTIFICATE IN GEOGRAPHIC NFORMATION SCIENCE

The PGCertGIS is a 60-point course that provides an interdisciplinary approach to Geographic Information Science. The programme is expected to be completed part time and as such is often attractive to those already in the spatial industry. The programme involves core and elective courses that cover the GIS foundations, theory, research methodology, data collection and processing analysis, and presentations. The programme commences with a three-day field course in Trimester 1 (GISC 421).

The PGDipGIS course of study consists of 120 points made up of:

- GISC 421 and STAT 483
- Two courses from GISC 422-424

POSTGRADUATE DIPLOMA IN GEOGRAPHIC NFORMATION SCIENCE

The PGDipGIS is a 120-point course that provides an interdisciplinary approach to Geographic Information Science. The programme involves core and elective courses that cover the GIS foundations, theory, research methodology, data collection and processing analysis, and presentations. The programme commences with a three-day field course in Trimester 1 (GISC 421).

The PGDipGIS course of study consists of 120 points made up of:

- GISC 421 and STAT 483
- At least two courses from GISC 422-424
- At least two further courses from GISC 422-429, GEOG 580
- Further points from the MGIS list of approved courses by the Programme Director.

The Programme Director may approve a substitution for up to 30 points to be taken as electives/approved courses.

Entry requirements: A Bachelor's degree with an average grade of B or higher in relevant 300-level courses, two undergraduate GIS courses, and acceptance by the Programme Director.

MASTER OF GEOGRAPHIC INFORMATION SCIENCE

The MGIS comprises 180 points of study and provides an interdisciplinary approach to Geographic Information Science, which includes taught courses and supervised research.

The first part of the programme consists of compulsory and elective courses which cover the GIS foundations, theory, research methodology, data collection and processing analysis, and presentations.

The second part involves the completion of a 60-point research project or research placement. The MGIS should normally be completed within 1 year of enrolling if the student commences in Trimester 1 or 18 months if the student commences in Trimester 2 or up to 4 years if a student is studying part time.

Part 1: The course of study for MGIS consists of courses worth at least 120 points, including:

- GISC 421, STAT 483 and GEOG 580
- At least two courses from GISC 422-424
- At least one further course from GISC 422-429
- Further points from the MGIS list of approved courses by the Programme Director

The Programme Director may approve a substitution for up to 30 points to be taken as electives/approved courses.

Part 2: A research project (GISC 511) or research placement (GISC512)

Entry to Part 2 requires the acceptance of a thesis proposal by the Joint Board of Studies and either a B+ average from Part 1 courses or special permission from the Director of the Joint Board of Studies.

PHD IN GEOGRAPHIC INFORMATION SCIENCE
The PhD is the highest degree offered by the School of Geography, Environment and Earth Sciences and usually takes three to four years to complete.

400-LEVEL GEOGRAPHIC INFORMATION SCIENCE COURSES

Course Code	Course Registration Number	Course Name	Points	Trimester Available
GISC 421	**CRN 31076**	**GEOGRAPHIC INFORMATION SCIENCE: APPLICATIONS AND IMPACT**	**15 PTS**	**1/3**

Prerequisite: Enrolment in GIS Postgraduate Programme
Coordinator: Prof David O'Sullivan

This course provides an overview of Geographic Information Science in New Zealand and internationally. Through field teaching, individual and group work, and guest lectures from industry professionals, students will gain a strong understanding of the dimensions of the geospatial industry from data collection, storage analysis and dissemination. Specific attention will be given to exploring Maori communities and organisations' use of and impact on GIS; ethics; and GIS fit within organisations, the economy, communities and impact on their decision making.

GISC 422	**CRN 31077**	**SPATIAL ANALYSIS AND MODELLING**	**15 PTS**	**1/3**

Prerequisite: GEOG215 and 315 or permission of Programme Director
Coordinator: Prof David O'Sullivan

Advances in data collection, such as crowdsourcing and the unique nature of geographic information require an understanding of the complexities of spatial data. Students on this course will learn to apply statistical techniques to the analysis of geographic data. Students will also explore relationships between spatial structures and processes using simulation models.

GISC 423	**CRN 31078**	**CARTOGRAPHY AND GEOVISUALISATION**	**15 PTS**	**2/3**

Prerequisite: GEOG 215 and 315 or permission of Programme Director
Coordinator: Dr Mairead de Roiste

This course provides a theoretical grounding in the various ways geographic information can be visualised. Beyond the conventional map display, alternate representations, interfaces to geographic data, visual

exploration of datasets and cartographic generalisation will be covered. The course introduces the concepts, principles, theories and applied components of Cartography and Geovisualisation.

GISC 424	CRN 31079	REMOTE SENSING	15 PTS	1/3

Prerequisite: GEOG 215 and 315 or permission of Programme Director

Coordinator: Andrew McMillan

A practical introduction to interpretation and analysis of satellite, aerial and radar imagery for earth observation. This course covers the basics of the electromagnetic spectrum and explores its interpretation and use in the analysis of remotely sensed data, specifically covering classification and image manipulation techniques for both active and passive sensors.

GISC 425	CRN 31080	SPECIAL TOPIC: GEOGRAPHIC COMPUTING	15 PTS	1/3

Prerequisite: GEOG 215 and GEOG 315 or permission of Programme Director

Coordinator: Prof David O'Sullivan

Advanced work in geographical information science is conducted by scripting and programming. This course introduces principles of computer programming in the context of popular libraries for the handling of geographic data. Basic programming skills in python are introduced to equip students for modern geospatial analysis environments.

GISC 429	CRN 31084 CRN 32017	INTERNSHIP	15 PTS	1/3 2/3

Prerequisite: Enrolment in GIS postgraduate programme and 60 points from the MGIS Schedule

Coordinator: Dr Mairead de Roiste

This course allows students to apply knowledge gained from the PGDipGIS/MGIS postgraduate courses within business, government and non-profit organisations while gaining career-related work experience, achieving a greater clarity regarding their career goals, and developing 'work ready' skills.

GISC 511	CRN 31085 CRN 31185	RESEARCH PROJECT	15 PTS	2/3 3/3

Prerequisite: Completion of Part 1 of the MGIS with a B+ average, and permission of the Programme Director

Coordinator: Dr Mairead de Roiste

This major research project gives the student scope to investigate a GIS related topic of particular interest, and centres on writing and presenting an extended research essay. It will consist of a research question, review of the literature, some primary research and analysis, and the leading of a seminar to share understanding of the project's outcomes with fellow students.

GISC 512	CRN 31086	PLACEMENT AND APPLIED RESEARCH PROJECT	15 PTS	3/3

Prerequisite	Completion of Part 1 of the MGIS with a B+ average and permission of the Programme Director
Coordinator	Dr Mairead de Roiste

This course comprises of a placement, a presentation, and a research project. The placement is a period of work with a GIS employer. The short research project aims to research a particular aspect of the work undertaken, or the host organization itself, to enrich the student's understanding of the organisation's work. A seminar aims to share understanding among fellow students of the role of the host organisation.

GISC 591	CRN 23161	THESIS	120 PTS	F/Y

Prerequisite:	PGDipGIS or MGIS with B+ average and permission of Programme Director
Coordinator:	Dr Mairead de Roiste

Master's thesis in GIS.

GEOGRAPHY

Geography at Victoria is concerned with spatial politics and practices of people at various scales, as well as the people's identities and relationships with places, resources and environments. We have key strengths in applied and action-oriented research which is oriented to social and environmental justice.

The postgraduate programme in Geography provides an opportunity for students to advance their understanding of key concepts and research applications pertaining to:

- Urban health and wellbeing (GEOG 410 (not offered in 2020); SCIE 401)
- Geographies of difference (GEOG 404 (not offered in 2020); GEOG 408; GEOG 411)

We also offer training in Geographic Information Science (GEOG 415) and knowledge pertinent to climate change mitigation (GEOG 407).

Geography can be studied at Certificate, Diploma, Honours and Masters levels under the supervision of expert staff. Students can choose a range of courses to create a coherent programme of study with approval from the Postgraduate Coordinator Geography. The majority of these courses will come from within the School of Geography, Environment and Earth Sciences (i.e., from Geography, Physical Geography, Environmental Studies, Development Studies, Geographic Information Science, Environmental Science or Geology), but may also include some from related fields of study such as Anthropology, Sociology, Psychology, Social Policy, Political Science, Asian Studies, Māori Studies, Pacific Studies, Media Studies, or Health Science depending on a student's previous majors and/or the permission of course coordinators. The specific combination of courses may coalesce within one of the key areas above or relate to a student's own specific focus such as development geography, environment and society, Indigenous knowledges, or migration.

Many of our courses are informed by relationships with, and contributions from, members of national, regional and local government agencies, non-governmental organisations or consulting companies. Frequently, students carry out research of direct relevance to these organisations, contributing useful and timely knowledge and helping their career prospects. Others go overseas to carry out research in Asia, the Pacific or Latin America supported by our strong staff networks in those regions.

Alongside courses, postgraduate students in Geography participate in regular Geography, Environment and Development (GED) Seminar Series, and Social Theory & Spatial Praxis Research Group sessions.

POSTGRADUATE CERTIFICATE IN SCIENCE IN GEOGRAPHY

The PGCertSc requires 60 points of postgraduate study and can be completed in one trimester or part time over two years. The Certificate can be converted into a Postgraduate Diploma in Science with a further 60 points of 400-level approved courses.

POSTGRADUATE DIPLOMA IN ARTS IN GEOGRAPHY

The Postgraduate Diploma in Arts (PGDipArts) offered by the Faculty of Humanities and Social Sciences is intended primarily for students who are interested in doing advanced study in Geography but are not intending to complete the GEOG 489 Research Project.

Entry requirements: A Bachelor's degree with a major in Geography, including GEOG 324 and GEOG 325 plus 40 points of approved courses. The diploma normally requires at least two trimesters of study and should be completed within four years of first enrolling.

POSTGRADUATE DIPLOMA IN SCIENCE IN GEOGRAPHY

The Postgraduate Diploma in Science (PGDipSc) in Geography is made up of 120 points at from GEOG 401-489, 580, PHYG 413-489, and does not require a research project.

Entry requirements: An undergraduate degree with an average grade of B or higher in relevant 300-level courses.
The PGDipSc can be completed in two trimesters or part-time over four years. Good academic grades in the PGDipSc may allow direct entry into and MSc Part 2 (thesis).

BA OR BSC WITH HONOURS IN GEOGRAPHY

Entry requirement: A Bachelor's degree with a major in Geography including GEOG 324 and GEOG 325 plus 40 points of approved courses from GEOG 312-323, ideally with an average grade of B+ or higher in these courses. Entry into Geography Honours from another undergraduate major may be granted with permission.

Students wishing to enrol in Honours in Geography must contact the Geography Postgraduate Coordinator (Prof Sara Kindon) by 10th December prior to the year of intended enrolment stating their desire to enroll and the names of academic staff members approached regarding supervision of potential research projects. Early application is recommended although approval to enrol in Honours may be granted until 10 January of the year of study.

The courses of study for a BSc(Hons) or BA (Hons) in Geography consists of:

- GEOG 489
- 90 points from GEOG 404-440, PHYG 413-489.

***Note**: Up to 60 points of these 90 points can be from other disciplines with approval from the Geography Postgraduate Coordinator. Some prerequisites may be required.

You are advised to select the courses you wish to take early and begin reading over the summer prior to enrolment. For GEOG 489 (Research Project), you should identify a possible topic as soon as possible and begin background reading, thinking or fieldwork as advised by a member of staff.

MASTER OF SCIENCE IN GEOGRAPHY

A MSc in Geography consists of two parts: Part 1 involves coursework and a research preparation course. Part 2 is a full-time research project, leading to a thesis. Full time enrolment is usually two years. Part time study may be undertaken with permission from the Geography Postgraduate Coordinator.

Entry requirements: Completion of an undergraduate degree or relevant graduate or postgraduate diploma, including 60 points from GEOG 301-399.
Study in Part 1 consists of GEOG 580 (Research Preparation and at least 105 points from the BSc(Hons)) or other schedules. Study in Part 2 is entirely by thesis research.

Entry requirements into Part 2: B+ in your Part 1 courses. You may also enter Part 2 with an Honours degree or postgraduate diploma.

The MSc may be awarded with Honours if both Parts 1 and 2 of the degree are completed within two and a half years of first enrolling for the degree. A candidate who enrols in Part 2 of the Master's programme, after completing a relevant Honours or Postgraduate diploma may have their Master's awarded with distinction or merit.

MASTER OF ARTS BY THESIS IN GEOGRAPHY

To enrol in a Master of Arts (MA) in Geography you must have a BA(Hons) degree with a First or Second Class Honours in Geography, or related subject (with permission of the Associate Dean). Prospective students must also obtain a recommendation by a potential thesis supervisor before enrolment.

The course of study for an MA in Geography is GEOG 591 (thesis).

PHD IN GEOGRAPHY

The PhD in Geography usually takes three to four years to complete.

400/500-LEVEL GEOGRAPHY COURSES

Course Code	Course Registration Number	Course Name	Points	Trimester Available
GEOG 404	**CRN 1679**	**GEOGRAPHY OF DEVELOPMENT STUDIES: YOUNG PEOPLE AND PARTICIPATORY DEVELOPMENT**	**30 PTS**	**1/3**

NOT RUNNING 2020

Participation is one of the current buzzwords of development, but what is it? How do we achieve it? And does it really result in more equitable benefits for those involved? In this course, we explore the various uses of the term participation and its impacts over the last 50 years within development discourse and geographic research. Specifically, we focus our engagement through the lens of refugee-background young people for it is with and through them that some of the challenging issues of participatory research and development become most acute.

The orientation and content of the course is informed by epistemologies infusing participatory action research and appreciative inquiry: critical pragmatism and feminism. It involves training in research design, analysis, facilitation and cross-cultural communication through experience in a 'real-world' project. It also involves assessments that reflect the importance of contextual research, methodological preparation, group work and reflective learning.

GEOG 407	**CRN 29107**	**SPECIAL TOPIC: CLIMATE POLICY**	**15 PTS**	**2/3**

Coordinator: Dr Alex Lo

This course provides an introduction to the policy and institutional dimensions of carbon pricing. Putting a price on carbon creates incentives for reducing greenhouse gas emissions. This market-based approach has important implications for climate change mitigation. The lectures will cover major international, national, and private-sector initiatives that involve carbon pricing, with a focus on those linked with an emission trading system. Cases from the UNFCCC, European Union, China, Australia, New Zealand, and other parts of the world will be presented and discussed.

GEOG 408	CRN 29108	GEOGRAPHY OF PLACE, POWER AND IDENTITY	15 PTS	2/3

Coordinator: Dr Marcela Palomino-Schalscha

This course provides an introduction to advanced debates within social and cultural geography, in particular around the theorisation of place, power and identity. The course will deal with a range of issues and grounded examples while introducing relational, postcolonial and feminist geographies.

GEOG 410	CRN 1691	GEOGRAPHIES OF WELLBEING	30 PTS	1/3

NOT RUNNING 2020

The course is designed to introduce students to the concepts of happiness, wellbeing and their relationship to place. The study of wellbeing at all levels is one of the fastest growing subfields in social science. This course draws on 'positive psychology', 'happiness economics' and human geography research and covers the following topics: subjective wellbeing and the city, global variations in wellbeing, the paradox of affluence, measuring and estimating wellbeing, socio-economic influences on wellbeing. The course also covers geographies of wellbeing, urban size and neighbourhood effects on wellbeing and quality of life indicators.

GEOG 411	CRN 1693	SPECIAL TOPIC: REFUGEE SPACES	30 PTS	1/3

Coordinator: Professor Sara Kindon

This course takes an emotional geographies' perspective to explore the material and digital spaces of 'refugeeness': from forced migration around the world to long-term settlement in Aotearoa New Zealand, we question interrelationships of power, place, identity and belonging through a focus on bodies, borders and boundaries.

GEOG 415	CRN 25033	INTRODUCTION TO GEOGRAPHIC INFORMATION SCIENCE AND ITS APPLICATIONS	15 PTS	2/3

Restrictions: GEOG 215, GEOG315, PHYG 415 (to 2012)

Coordinator: Dr Mairead de Roiste

Geographic Information Systems (GIS) can be used to answer a number of spatial questions. GIS is currently used in a variety of areas, such as criminal profiling, biology, geography, disaster management, marketing, access to health care, conservation monitoring and archaeology. This course will introduce students to the principles of GIS including thinking about spatial problems, appropriate data, types of analysis and how best to present results. The course runs a number of concurrent practical sessions, which allows students to build experience of a particular GIS software program (ArcGIS).

SCIE 401	**CRN 10763**	**SPECIAL TOPIC: URBAN GEOGRAPHY AND URBAN HEALTH**	**15 PTS**	**1/3**

Coordinator: Dr Mirjam Schindler

This course will provide students with skills to argue which characteristics a healthy city would have to be a city which provides a context for urban health. Students will be equipped to use geographical tools and concepts to analyse various intra-urban processes and their effects on urban health. The course will explore how characteristics of urban (notably residential) environments might promote or hinder urban health, how such effects can be analysed, and which measures urban planning can offer. Students will be exposed to contemporary urban geography debates about urban health in national and international contexts.

GEOG 440	**CRN 10015 CRN 17425 CRN 11841 CRN 17337**	**DIRECTED INDIVIDUAL STUDY**	**30 PTS**	**1/3 1+2/3 2/3 3/3**

Prerequisite: Permission of the Geography Postgraduate Coordinator

A supervised programme of study designed by the student with the support of an academic supervisor and approved by the Geography Postgraduate Coordinator. For more information please contact Professor Sara Kindon (T1) or Dr Mirjam Schindler (T2).

GEOG 489	**CRN 10020**	**RESEARCH PROJECT (HONS)**	**30 PTS**	**1+2/3**

Coordinator: Professor Sara Kindon (T1) Dr Mirjam Schindler (T2)

GEOG 489 offers BA or BSc with Honours students in Geography the opportunity to design and carry out a modest independent research project on a topic of your choice under the guidance of a supervisor. It involves training support in research design, approach and methods through one-on-one sessions with a supervisor, the weekly GED (Geography, Environment and Development) Research seminars, and through attendance at, and presentation within, the GEOG 324 course in T1. In July or August, there is usually a dedicated seminar where students receive feedback on their preliminary analysis from other students and staff. You are also able to sit in on classes associated with GEOG 580 in T2.

GEOG 580	**CRN 7766**	**RESEARCH PREPARATION**	**15 PTS**	**2/3**

Coordinator: Dr Marcela Palomino-Schalscha

This course introduces postgraduate students to the fundamentals of conducting research. It introduces the research process, explores research concepts, provides basic research skills, and develops ways of communicating research findings. The course prepares students going on to do a masters thesis but also provides material for non-Masters students which will prove valuable in a range of employment contexts.

GEOG 591	CRN 1721	Geography Thesis	120 PTS	F/Y

Coordinator: Professor Sara Kindon (T1) Dr Mirjam Schindler (T2)

GEOG 591 involves students in independent research under the guidance of an academic supervisor, with administrative support from the Geography Postgraduate Coordinator. The Master's thesis is normally carried out over one academic year of full-time study and should demonstrate the student's mastery of their discipline. It involves the preparation and approval of a research proposal, first-hand research and analysis, then the preparation of a thesis for examination. A Master's thesis is 40,000 words in length and examined by one VUW staff member and one NZ examiner.

GEOG 690	CRN 1725	Geography for PhD	360 PTS	3 Years

Coordinator: Professor Sara Kindon (T1) Dr Mirjam Schindler (T2)

GEOG 690 involves students in independent research under the guidance of two academic supervisors, with administrative support from the Geography Postgraduate Coordinator. The PhD thesis is expected to take three years of full-time study and to demonstrate an original contribution to the student's discipline. It involves the preparation and approval of a research proposal, first-hand research and analysis, then the preparation of a thesis for examination. A PhD thesis is 80,000-100,000 words in length and is usually examined by one VUW, one NZ and one international examiner.

PHYSICAL GEOGRAPHY

Physical Geography is the branch of natural science that deals with understanding the processes and patterns in the physical environment. At the heart of this discipline is the concept of Earth Systems Science, in which the Earth is made up of the inter-connected realms of the atmosphere, biosphere and geosphere.

The core areas within Physical Geography at Victoria University are geomorphology, climatology, hydrology, glaciology and Quaternary environmental change, and these are linked both with scientific disciplines such as Geology, Geophysics, Biology, Physics, Chemistry, as well as with the Social Sciences, to inform current and future generations of the critical importance of human-environment relations to life on Earth. We emphasise interdisciplinary learning, research and the development of key skills in careful field observation, data measurement and computer modelling. Such skills are increasingly being utilised by physical science practitioners in research, education and in the private sector.

POSTGRADUATE CERTIFICATE IN SCIENCE IN PHYSICAL GEOGRAPHY

The Postgraduate Certificate in Science (PGCertSc) may appeal to students wanting to undertake postgraduate study by a programme of course-work that does not involve a research project.

The PGCertSc also provides an opportunity for those students who are not able to meet the entry requirements for the BSc(Hons) or MSc Part 1. The PGCertSc requires 60 points of postgraduate study and can be completed in one trimester or part time over two years. It can be converted into a Postgraduate Diploma in Science with a further 60 points of 400-level approved courses.

The PGCertSc course of study for Physical Geography consists of 60 points from PHYG 413-440.

POSTGRADUATE DIPLOMA IN SCIENCE IN PHYSICAL GEOGRAPHY

The Postgraduate Diploma in Science (PGDipSc) is made up of 120 points at 400 and 500-level and does not require a research project. **Entry requirement**: An undergraduate degree with an average grade of B or higher in relevant 300- level courses.

Good academic grades in the PGDipSc may allow direct entry into MSc Part 2 (thesis).
The PGDipSc course of study for Physical Geography consists of 120 points from PHYG 413–440.

BSC WITH HONOURS IN PHYSICAL GEOGRAPHY

Entry requirements: BA or BSc degree including GEOG 324 and GEOG 325 plus 40 points of approved courses, ideally with an average grade of B+ or higher in these courses. Entry into Physical Geography Honours from another undergraduate major may be granted with permission of the Associate Dean.

Students wishing to enrol in a BSc(Hons) in Physical Geography should write to the Physical Geography Graduate Coordinator (A/Prof Kevin Norton) by 20 December stating both their desire to enrol in Honours and the names of academic staff members approached regarding supervision of potential research projects. Early application is recommended although approval to enrol in Honours may be granted until 10 January of the year of study.

The BSc(Hons) in Physical Geography course of study consists of:

- PHYG 489
- 90 points in an approved combination from PHYG 404–440 or other approved courses; at least 30 points shall be from PHYG 413–440.

MASTER OF SCIENCE IN PHYSICAL GEOGRAPHY (MSc)

A MSc in Physical Geography consists of two parts: Part 1 involves coursework and a research preparation course. Part 2 is a full-time research project, leading to a thesis. Full time enrolment is usually two years. Part time study may be undertaken with permission from the Head of School.

Entry requirements: Completion of an undergraduate degree or relevant graduate or postgraduate diploma with average grades of B+ or above, including 80 points from GEOG 301–399. Study in Part 1 consists of at least 120 points from the BSc(Hons) or other schedules. Study in Part 2 is entirely by thesis research.

Entry requirements for Part 2: A grade average of B+ in your Part 1 courses. You may also enter Part 2 with an Honours degree or postgraduate diploma.

The MSc may be awarded with Honours if both Parts 1 and 2 of the degree are completed within two and a half years of first enrolling for the degree. A candidate who enrols in Part 2 of the Master's programme, after completing a relevant Honours or Postgraduate diploma may have their Master's awarded with distinction or merit. To be eligible, a full-time candidate shall complete all work for Part 2 within 18 months from the date of first enrolment in Part 2.

The course of study for an MSc in Physical Geography is:

- **Part 1**: ESCI 580; 105 further points from PHYG 413–440, of which up to 30 points may be replaced by other approved courses
- **Part 2**: PHYG 591 (thesis).

PHD IN PHYSICAL GEOGRAPHY

The PhD in Physical Geography consists of full-time research. It usually takes three to four years to complete.

400/500-LEVEL PHYSICAL GEOGRAPHY COURSES

Course Code	Course Registration Number	Course Name	Points	Trimester Available
PHYG 413	**CRN 27050**	**CLIMATE DYNAMICS**	**15 PTS**	**2/3**

Prerequisites GEOG220 or 321
Coordinator Prof James Renwick

Provides and overview of the circulation of the global atmosphere, the basic drivers of the climate system, including the global radiation balance, and how climate varies seasonally and from year to year.

PHYG 414	**CRN 15669**	**CLIMATE CHANGE: LESSONS FROM THE PAST**	**15 PTS**	**1/3**

Coordinator Prof Rewi Newnham

The course investigates the physical dimension of natural hazards and risks by studying the occurrence of global trends in natural hazards and risks, and by understanding their nature and identifying the risk they represent in a global context. The human dimension is considered by studying the assessment and management of human vulnerability in the face of those identified natural hazards and risks.

PHYG 418	CRN 15671	GEOMORPHOLOGY AND ITS APPLICATION	15 PTS	1/3

Coordinator: Dr Claire Lukens

This course explores the application of geomorphology to understanding landscape change. The focus is on landscapes as dynamic entities in which tectonic and erosive forces combine to create, shape and ultimately destroy topography. These dynamic processes act constantly to drive changes in landforms either towards or away from quasi-stable states. Understanding Earth's surface requires knowing how landforms have developed, which processes are currently acting on these surfaces, and how they might respond to future change. To this end, geomorphology is presented as an interdisciplinary subject, drawing on concepts and tools from across the physical sciences in an effort to disentangle the often-combined effects of geologic, climatic, and anthropogenic forces. A small number of specific topics and methods will be examined with reference to the modern geomorphic literature.

PHYG 419	CRN 15672	NATURAL HAZARDS AND RISK: PROCESSES AND IMPACTS	15 PTS	2/3

Coordinator: Dr Jamie Howarth

This course provides an understanding of the nature, distribution and frequency of natural hazards both within New Zealand and globally. It analyses the causes of natural hazards, the processes driving them, the methodologies used in their analysis and their impacts both within New Zealand and globally.

PHYG 420	CRN 17257	WATER RESOURCES	15 PTS	2/3

Coordinator: A/Prof Bethanna Jackson

This course aims to provide an understanding of the dominant components of the water cycle at local and global scales and to provide the skills necessary to undertake an analysis of the water resources of a region or catchment. It covers three broad areas. 1) The processes governing surface, subsurface and atmospheric movement of water are introduced. Global water and energy cycles, soil water flow processes, evapotranspiration, groundwater and catchment scale rainfall runoff and solute transport processes are covered. 2) It focuses on the assessment, measurement, and quantification of surface and subsurface water resources, together with the methods and requirements of data acquisition, as well as issues relating to the assessment, quantification, and monitoring of water quality. 3) The course briefly summarises the effects, both physical and social, of manipulating water resources and the mechanisms available for resolving conflicting usage requirements.

PHYG 423	CRN 15673	FIELD GEOMORPHOLOGY	15 PTS	1/3

Coordinator: A/Prof Kevin Norton

Through a field examination of the landform systems of New Zealand, this course analyses contemporary and past landform evolution, and its impacts on society. The course is focused around an intensive fieldwork programme conducted on the South Island, whereby geomorphic systems from the high alps to coastal plain are investigated and the linkages between them discussed. Issues such as climate change and glacial processes, hillslope instability, coastal erosion and landform evolution are covered in the context of the spectacular environment of the active New Zealand landscape.

PHYG 440	CRN 10017 CRN 26238	DIRECTED INDIVIDUAL STUDY	15 PTS	1+2/3 1/3

Prerequisites: Permission of Programme Director
Coordinator: TBC

For more information please contact the Postgraduate Coordinator (A/Prof Kevin Norton)

PHYG 489	CRN 1150	RESEARCH PROJECT (HONS)	30 PTS	1+2/3

Coordinator: A/Prof Kevin Norton

This course involves the formulation and execution of a research project of your own choice under the guidance of a staff member. It is compulsory for all those enrolled for BSc(Hons) in Physical Geography. If you are considering taking an Honours degree in Physical Geography make an appointment to see the Postgraduate Coordinator, A/Prof Kevin Norton, who will offer guidance, discuss resources, and point you to potential supervisors. It is important that you discuss possible research topics with appropriate staff *before* the academic year commences.

PHYG 489 provides you with the opportunity and forum to design and carry out an independent research project on a topic of your choice. It involves training support in research design, approach and methods through one-on-one sessions with a supervisor, the weekly Geography, Environment and Development (GED) Seminar Series, and through participation in the ESCI 580 Research Preparation course in trimester 2.

You will need to discuss a possible topic with a staff member prior to applying for admission to Honours to the Postgraduate Coordinator A/Prof Kevin Norton in December preceding the year of study. Once you have identified a topic, an interim supervisor will be allocated to you, and you should work with this person to develop your research proposal so that you are ready to begin your research in earnest upon enrolment. The sooner you can narrow down your focus the better it will be for your work throughout the year. Do not wait to enrol before starting to do some exploratory research and drafting your proposal. Once enrolled, your proposal will be reviewed by the Postgraduate Coordinator and your interim supervisor. You will receive feedback so that you can develop your project. Once your proposal and topic are approved, you will be allocated to a permanent supervisor with whom you will work throughout the year.

Throughout the year, you will also be expected to:

- submit a topic statement (March)
- submit a research proposal (March)
- provide a written progress report (May)
- give a short presentation on your approach and findings (August)
- submit a draft version of your research paper (September)
- submit the final version of your research paper (October).

ESCI 580	CRN 28445	RESEARCH PREPARATION	15 PTS	2/3

Coordinator: A/Prof Michael Hannah

The course aims to provide the skills and techniques required for successful scientific research in Earth Sciences including: philosophy of science; bibliographic database searches; writing, reviewing and revision of proposals, abstracts and journal papers; strategies for poster and oral presentations. Students will work with their intended MSc thesis project supervisor to develop and submit for grading a research proposal for their project. This is due at the end of the course as part of the assessment, along with an oral presentation of the research proposal.

PHYG 591	**CRN 1159**	**Thesis**	**120 PTS**	**1+2/3**

Prerequisites: Permission of Programme Director
Coordinator: TBC

For more information please contact the Postgraduate Coordinator (A/Prof Kevin Norton).

GEOLOGY

Geology is the study of the dynamic history and processes of the Earth. Topics that we cover under these areas include the Earth's internal structure, plate tectonics, earthquakes, mountain building, volcanic eruptions, the origin and evolution of life, extinction events, the formation of sedimentary basins, climate and sea-level changes, glaciation and landscape evolution, and the origin and conservation of the Earth's natural resources, including minerals, fossil fuels, soils and water.

Understanding geological processes is becoming increasingly important for those concerned with the extraction and/or preservation of the Earth's natural resources, the evaluation of natural hazards, anticipating and mitigating the social and environmental effects of global changes, and undertaking environmental and resource planning and monitoring.

POSTGRADUATE CERTIFICATE IN SCIENCE IN GEOLOGY

The PGCertSc may appeal to students seeking a postgraduate qualification that does not involve a research project, or for those who are not able to meet the entry requirements for the BSc(Hons) or MSc Part 1. The PGCertSc in Geology requires 60 points of postgraduate study and can be completed in one trimester or part time (up to two years). It can be converted into a Postgraduate Diploma in Science with a further 60 points of 400-level approved courses.

POSTGRADUATE DIPLOMA IN SCIENCE IN GEOLOGY

The PGDipSc in Geology is made up of 120 points at 400 and 500-level and does not require a research project, although a project may be included where appropriate. The minimum entry qualification is an undergraduate degree with an average grade of B or higher in relevant 300-level courses. The PGDipSc can be completed in two trimesters or part time (up to four years). Good academic grades in the PGDipSc may allow direct entry into an MSc Part 2 (thesis).

With the approval of the Postgraduate Coordinator up to 30 points of appropriate 400-level courses from elsewhere in the School or Science Faculty can be included in the programme of study for the PGDipSc (e.g. BIOL, CHEM, ENSC, GPHYS, MATH, PHYG or PHYS).

BSC WITH HONOURS IN GEOLOGY

An Honours degree follows an undergraduate degree and provides students with depth in a specialised field. It could also follow on from a Graduate Diploma in Science (GDipSc) if necessary requirements have been met. A Bachelor of Science with Honours (BSc(Hons)), is a one-year full-time programme consisting of 90 points of coursework and a research project (GEOL 489). It may also be undertaken part-time with approval. It can also lead directly to PhD study.

Entry requirement: A BSc in an appropriate field with an average grade of B+ or higher in relevant 300-level courses.

If you are intending to undertake a research project, you should identify a topic and supervisor as soon as possible and begin background reading, thinking or fieldwork as advised by the relevant member of staff.

If you wish to enrol in a BSc with Honours in Geology, please contact the Earth Sciences Postgraduate Coordinator, Prof Colin Wilson, stating your desire to enrol in Honours and the names of School staff you have approached regarding potential research projects before the end of Trimester 2, prior to the year you wish to study.

The course of study for BSc Honours in Geology consists of:

- GEOL 489
- ESCI 451, 452, 453
- 45 further points from ESCI 401 - 488

With the approval of the Postgraduate Coordinator up to 30 points of appropriate 400-level courses from elsewhere in the School or Science Faculty can be included in the programme of study for the BSc (Hons) (e.g. BIOL, CHEM, ENSC, GPHYS, MATH, PHYG or PHYS).

Code	Title	Trimester
ESCI 404	ST: Topics in Earth Sciences (not offered in 2020)	1 or 2 or 3
ESCI 407	Global Tectonics	2
ESCI 408	Special Topic: Frontiers in Palaeobiology	2
ESCI 411	Advanced Exploration Geophysics (not offered in 2020)	2
ESCI 412	Paleoclimatology	1
ESCI 413	Geochemical Forensics of Earth's Origins, History and Future	2
ESCI 414	Physics and Chemistry of Volcanoes	1
ESCI 440	Directed Individual Study (30 points)	F or 1 or 2+3
ESCI 441	Directed Individual Study (15 points)	1 or 2 or 3
ESCI 451	Active Earth	1
ESCI 452	Earth History	1
ESCI 453	Earth Materials and Resources	2
ESCI 449	Earth Sciences – International Field Course (not offered in 2020)	3
GEOL 489	Research Project (Honours)	F

MASTER OF SCIENCE IN GEOLOGY

A MSc consists of two parts, Part 1 (the first year) involves coursework and a research preparation course. Part 2 (the second year) is a full-time research project, leading to a thesis. Full-time enrolment is usually two years. Part-time study may be undertaken with permission from the Head of School.

Entry requirements: Completion of an undergraduate degree or relevant graduate diploma, including 80 points from ESCI 301–349 (including ESCI 341 and 342) or their equivalent at another University. An average grade of B+ is normally required for entry to Part 1. Applicants who do not meet this level may enroll for the first year in the PGDipSc and transfer to Part 2 subject to attainment of suitable grades and having a project and supervisor(s) arranged.

Study in Part 1 consists of 120 points from the BSc(Hons) or other schedules (see previous section). Four of the courses (ESCI 451, ESCI 452, ESCI 453, ESCI 580) are compulsory and the remaining 60 points are chosen by the student, normally from the courses tabled above. With the approval of the Graduate

Coordinator, however, up to 30 points of appropriate 400-level courses from elsewhere in the School or Science Faculty can be included in the programme of study in Part 1 (e.g. BIOL, CHEM, ENSC, GPHYS, MATH, PHYG or PHYS).
Study in Part 2 is entirely by thesis research and will require a grade average of B+ in your Part 1 courses and agreement from an academic to act as your supervisor. You may also enter Part 2 with an Honours degree or Postgraduate Diploma in Science in an appropriate area of study.
The MSc may be awarded with Honours if both Parts 1 and 2 of the degree are completed within two and a half years of first enrolling for the degree. A candidate who enrols in Part 2 of the Master's programme, after completing a relevant Honours or Postgraduate diploma may have their Master's awarded with distinction or merit. To be eligible, a full-time candidate shall complete all work for Part 2 within 18 months from the date of first enrolment in Part 2.

The course of study for an MSc in Geology is as follows:

- **Part 1**: ESCI 451, 452, 453, 580; 60 further points in courses from ESCI 401-488 or other approved courses (see above).
- **Part 2**: GEOL 591 (thesis).

PHD IN GEOLOGY

The PhD in Geology usually takes three to four years to complete.

400/500-LEVEL GEOLOGY COURSES

Course Code	Course Registration Number	Course Name	Points	Trimester Available
ESCI 404	**CRN 15246** **CRN 18009**	**ST: TOPICS IN EARTH SCIENCES**	**15 PTS**	**1+2/3** **2/3**

NOT RUNNING 2020

Prerequisites: 40 300-level points
Coordinator: Dr Warren Dickinson

This course consists of a selection of two to five topics offered each year. Students must take TWO of the topics to complete the course. The topics are chosen at the start of the year, and the offering varies from year to year depending on staff availability and student interest. Most of the topics are offered in trimester 2, but depending on time tables, some topics may be offered in trimester 1. Recent topics included: glacial geology, paleomagnetism, sedimentary petrology, oceanography, paleoclimatology, cosmochemistry, geochemical methods, isotope geochemistry, and evolution.

ESCI 407	**CRN 15248**	**GLOBAL TECTONICS**	**15 PTS**	**2/3**

Prerequisites: ESCI 302
Coordinator: A/Prof Simon Lamb

This course studies tectonics of global plate boundary settings and general principles in geodynamics and geotectonics. In odd years the focus is usually on the NZ plate boundary zone and in even years (i.e. in 2020) the focus is more generally on the mechanics and kinematics of faulting in the continental crust.

ESCI 408	CRN 17081	SPECIAL TOPIC: FRONTIERS OF PALAEOBIOLOGY	15 PTS	2/3

Prerequisites: 20 300-level ESCI points

Coordinator: Prof James Crampton

This course will review some of the latest results in the field of palaeobiology. Using research papers published over the last twelve months, we will choose the most exciting and extraordinary topics available. Depending on what's published in that period, topics may include discussions on mass extinctions, processes and patterns in the fossil record, human evolution and any particularly spectacular fossils that are newly reported. Participants will be encouraged to suggest study topics in any area of palaeobiology that interests them.

ESCI 411	CRN 1524	ADVANCED EXPLORATION GEOPHYSICS	15 PTS	2/3

NOT RUNNING 2020

Prerequisites: ESCI 305

Coordinator: Dr Calum Chamberlain

This course covers geophysical topics relevant to Earth science research in New Zealand and elsewhere including: seismic exploration, anisotropy in rocks, seismic wave attenuation and amplitude behaviour, gravity studies, geodesy, geophysics and geothermal studies, palaeomagnetism and ground-penetrating radar. The course also covers reflection seismic processing.

ESCI 412	CRN 15255	PALEOCLIMATOLOGY	15 PTS	1/3

Prerequisites: ESCI 301

Coordinator: Dr Gavin Dunbar

ESCI 412 is a study of contemporary research papers in paleoclimate science. We concentrate on environmental proxy indicators, dating methods and climate dynamics. The course examines prominent Quaternary records from New Zealand as well as high profile records from elsewhere (for example, polar ice and sediment cores and tropical climate records from speleothems). We also develop an understanding of how the atmosphere, ocean and cryosphere influence climatic change as recorded in the geological record. This includes a discussion of orbital forcing (Milankovitch cycles) as well as sub- orbital features such as Dansgaard-Oeschger events and ENSO.

ESCI 413	CRN 15257	GEOCHEMICAL FORENSICS OF EARTH'S ORIGINS, HISTORY AND FUTURE	15 PTS	2/3

Prerequisites: ESCI 303

Coordinator: Dr Monica Handler

ESCI 413 is an advanced course presenting petrologic/geochemical techniques and concepts used for reconstructing Earth processes. Topics include trace element and isotope geochemistry, mantle processes and magmatism, and marine and paleoenvironmental geochemistry.

ESCI 414	**CRN 15181**	**PHYSICS AND CHEMISTRY OF VOLCANOES**	**15 PTS**	**1/3**

Coordinator: Prof Colin Wilson

ESCI 414 is an advanced course covering how volcanoes work and how they can be studied from the products of past eruptions, as well as from present-day information. The course is focused around case studies prepared by the lecturers, or their colleagues, and is also designed to prepare students to tackle the challenges involved in research presentation. As part of the course, each student will present 3 x 15-minute seminars on topics based around those covered in the lectures, and each student will be allocated a topic from which to prepare a detailed essay as a final report.

ESCI 440	**CRN 15260** **CRN 26245** **CRN 28392**	**DIRECTED INDIVIDUAL STUDY**	**30 PTS**	**F** **1/3** **2+3/3**

Prerequisites: Permission of the Head of School

ESCI 441	**CRN 15261** **CRN 17049** **CRN 26249**	**DIRECTED INDIVIDUAL STUDY**	**15 PTS**	**1/3** **2/3** **3/3**

Prerequisites: Permission of the Head of School

ESCI 449	**CRN 23187**	**EARTH SCIENCES – INTERNATIONAL FIELD COURSE**	**15 PTS**	**3/3**

NOT RUNNING 2020

Prerequisites: 60 300-Level points from ESCI, GEOG including one of ESCI 341-344 or GEOG 323

Coordinator: Dr Warren Dickinson

This international field course in earth sciences aims to examine key geographical, geological and/ or geophysical localities. The course will offer a variable but unique insight, understanding and experience of earth science in the field beyond that which already exists in New Zealand. This course is offered in alternate years, with the next run in the USA from November 2021 to December 2021 (dates TBC). Numbers are limited, apply by 1 April 2020. An extra fee beyond that for the course, covering travel and subsistence costs, applies and is to be met by the student.

ESCI 451	**CRN 32176**	**ACTIVE EARTH**	**15 PTS**	**1/3**

Prerequisites: Permission of Earth Sciences Postgraduate Coordinator

Restrictions: ESCI 402, PGEO 401

Coordinator: Prof Colin Wilson

The physical and chemical phenomena governing tectonism, magmatism, and active margin processes in general interact on a wide variety of timescales. This course explores the observations on which modern understanding of active earth processes is based, the interaction between those processes, and the implications they have for hazard. Using global and New Zealand examples, this course explores how we make and evaluate geoscientific observations and effectively communicate our findings. The topics addressed include theoretical and empirical models of plate boundary processes, including subduction, magmatism, faulting, and fluid migration.

ESCI 452	CRN 32177	EARTH HISTORY	15 PTS	1/3

Prerequisites: Permission of Earth Sciences Postgraduate Coordinator

Restrictions: ESCI 403

Coordinator: A/Prof Rob McKay

This course will examine stratigraphic principles and approaches used to reconstruct past depositional environments, to then interpret major tectonic and/or climatic events in Earth's history. Geochemical and paleontological proxies will be used to identify changes in Earth's environment and climate over last 100 million years. An emphasis will be placed on an integrated stratigraphic dataset to interpret the history of NZ's sedimentary basins.

ESCI 453	CRN 32178	EARTH MATERIALS AND RESOURCES	15 PTS	2/3

Prerequisites: Permission of Earth Sciences Postgraduate Coordinator

Restrictions: ESCI 416

Coordinators: Dr Monica Handler and Prof Rupert Sutherland

Knowledge of Earth materials and resources and their impact on the Earth system is essential for responsible resource extraction and sustainable development. This course will explore the origin, extraction, uses and sustainability of a range of Earth resources. Topics include conventional energy resources such as hydrocarbons, our transition to `green' resources, and the metals and other resources required for modern construction, energy production, and energy storage.

GEOL 489	CRN 1773	RESEARCH PROJECT (HONS)	30 PTS	F

Coordinator: Prof Colin Wilson

This course involves the formulation and execution of a research project of your own choice under the guidance of a staff member. It is compulsory for all those enrolled for BSc(Hons) in Geology.

If you are considering taking an Honours degree in Geology make an appointment to see the Earth Sciences Postgraduate Coordinator (Prof Colin Wilson) who will offer guidance, discuss resources, and point you to potential supervisors. It is important that you discuss possible research topics with appropriate staff *well before* the academic year commences.

ESCI 580	CRN 28445	RESEARCH PREPARATION	15 PTS	2/3

Coordinator: A/Prof Michael Hannah

The course aims to provide the skills and techniques required for successful scientific research in Earth Sciences including: philosophy of science; bibliographic database searches; writing, reviewing and revision of proposals, abstracts and journal papers; strategies for poster and oral presentations. Students will work with their intended MSc thesis project supervisor to develop and submit for grading a research proposal for their project. This is due at the end of the course as part of the assessment, along with an oral presentation of the research proposal.

GEOPHYSICS

Geophysics is the study of the structure, properties and processes of the Earth using tools from physics and mathematics.

Geophysics at Victoria is grouped into two themes—Solid Earth Geophysics and Meteorology. Students interested in the Geophysics programme at Victoria should select a research topic in consultation with the staff member who will supervise the project.

Geophysics research interests include meteorology and forecasting methodologies, geomagnetism, magnetotellurics and palaeomagnetism, earthquake seismology and earthquake recurrence, fault mechanics and the state of stress in the Earth, active source seismology and tectonics, volcano geophysics, anisotropy of the crust and mantle and lithospheric structure, glacial geophysics and geodesy.

STUDY OPTIONS

Prerequisites: A BSc degree including 60 points of approved courses from (ESCI, MATH, PHYS 300 Level) or their equivalent at another University, generally with a B+ or better average in relevant coursework. A suitable level of preparation in mathematics is essential.

BSC WITH HONOURS IN GEOPHYSICS

An Honours degree follows an undergraduate degree such as a BSc and is designed to provide students with depth in a specialised field.

A BSc(Hons) in Geophysics is a stand-alone one-year full-time programme involving 90 points of coursework and a research project (GPHS 489). Part-time enrolment may be possible with permission from the Head of School.

Entry requirements: The minimum entry requirement is a BSc in an appropriate field with an average grade of B+ or higher in relevant 300-level courses. A research project is an important part of the year's work and provides practical training in research methods, evaluation of published research and experience of the scientific process.

If you wish to enrol in GPHS Honours, please contact the Earth Sciences Graduate Coordinator stating both your desire to enrol in Honours and the names of School staff you have approached regarding potential research projects before the end of trimester 2 prior to the year you wish to study. You are advised to select the courses you wish to take early in consultation with your supervisor and begin reading over the summer prior to enrolment.

The course of study for a BSc(Hons) in Geophysics consists of:

- GPHS 489
- 90 points from ESCI 407, 411, 451, GPHS 401-488, MATH 461.

POSTGRADUATE CERTIFICATE IN SCIENCE IN GEOPHYSICS (PGCertSc)

The PGCertSc is offered in all MSc subjects. It may appeal to students seeking a postgraduate coursework qualification that does not involve a research project. The PGCertSc also provides an opportunity for those students who are not able to meet the entry requirements for the BSc(Hons) or MSc Part 1.

The PGCertSc requires 60 points of postgraduate study and can be completed in one trimester or part time over two years. It can be converted into a Postgraduate Diploma in Science with a further 60 points of 400-level approved courses.

The PGCertSc course of study for Geophysics consists of 60 points from ESCI 407, 451, 580, GPHS 401–489, MATH 461.

POSTGRADUATE DIPLOMA IN SCIENCE IN GEOPHYSICS (PGDipSc)

The PGDipSc is made up of 120 points at 400 and 500-level and does not require a research project, although a project may be included where appropriate. The minimum entry qualification is an undergraduate degree with an average grade of B or higher in relevant 300-level courses. The PGDipSc can be completed in two trimesters or part time over four years. Good academic grades in the PGDipSc may allow direct entry into and MSc Part 2 (thesis).

The PGDipSc course of study for Geophysics consists of 120 points from ESCI 407, 451, 580, GPHS 401-489, MATH 461.

POSTGRADUATE DIPLOMA IN METEOROLOGY

The course of study consists of courses worth a total of 120 points. This includes six courses worth 90 points from GPHS 420-431, GPHS 589.

MASTER OF METEOROLOGY

The course of study for the MMet consists of courses worth a total of 180 points, including a project (30 points). Prerequisites may apply for some courses.

- Six courses worth 90 points from GPHS 420-431
- Three courses worth 90 points from GPHS 520-589

MASTER OF SCIENCE (MSc) IN GEOPHYSICS

A MSc consists of two parts: Part 1 involves coursework of 120 points from the BSc(Hons) or other schedules, and a research preparation course (ESCI 580). Part 2 is a full-time research project, leading to a thesis. Full time enrolment is usually two years. Part time study may be undertaken with permission from the Head of School.

Entry into the MSc for Geophysics requires completion of an undergraduate degree or relevant graduate or postgraduate diploma, including 60 points of approved courses from 300-level ESCI, MATH or PHYS. A grade of B+ or better is advised.

Requirements: Students must receive a grade average of B+ in your Part 1 courses to continue to complete Part 2. You may also enter Part 2 with suitable grades in an Honours degree or postgraduate diploma.

The MSc may be awarded with Honours if grades are high and if both Parts 1 and 2 of the degree are completed within two and a half years of first enrolling for the degree. A candidate who enrols in Part 2 of the Master's programme, after completing a relevant Honours or Postgraduate diploma may have their Master's awarded with distinction or merit.

Recommended course combinations for areas of focus within Part 1 of the MSc Geophysics:

Solid Earth: ESCI 580, GPHS 441, 445 and 447, and 60 approved points from (400-level GPHS, and ESCI courses). With the approval of the Postgraduate Coordinator these may include appropriate MATH/PHYS or GEOG 400-level courses.

Meteorology: ESCI 580, three courses from GPHS 420–426 plus 60 approved points from (400-level GPHS, PHYG and ESCI courses,). With the approval of the Postgraduate Coordinator these may include appropriate MATH/PHYS 400-level courses.

PHD IN GEOPHYSICS

The PhD in Geophysics usually takes three to four years to complete. It consists of a research project.

400/500-LEVEL GEOPHYSICS COURSES

Course Code	Course Registration Number	Course Name	Points	Trimester Available
GPHS 420	**CRN 8156**	**INTRODUCTION TO DYNAMICAL METEOROLOGY**	**15 PTS**	**1/3**

Prerequisites: MATH 323

Coordinator: Dr Jim McGregor

This course introduces students to the fundamental concepts of dynamical meteorology and develops skills in problem solving.

GPHS 421	**CRN 8157**	**MID-LATITUDE WEATHER SYSTEMS**	**15 PTS**	**1/3**

Coordinator: Dr Jim McGregor

This course extends the knowledge gained in GPHS 420 to the development of an understanding of weather systems in middle latitudes. Conceptual and mathematical models are investigated to provide insights into the physical processes that occur during development, including diagnosis of vertical motion. Special emphasis is paid to weather systems in New Zealand and the Tasman Sea region.

GPHS 422	**CRN 8158**	**RADIATION AND THERMODYNAMICS FOR METEOROLOGY**	**15 PTS**	**1/3**

Coordinator: Dr Jim McGregor

Students are introduced to the concepts of radiation and thermodynamics that are relevant to applications in meteorology and atmospheric physics. Students who are intending to enrol for GPHS 426 Climatology and Remote Sensing should complete this course first.

GPHS 423	CRN 8159	CLOUD PHYSICS AND BOUNDARY LAYER METEOROLOGY	15 PTS	2/3

NOT RUNNING 2020

Coordinator: Dr Jim McGregor

This course investigates the microphysical properties of clouds. The meteorology of the lower boundary layer of the Earth's atmosphere is also examined. This course is offered in alternate years.

GPHS 424	CRN 8160	SATELLITE METEOROLOGY	15 PTS	2/3

Coordinator: Dr Jim McGregor

This course examines the orbital characteristics and instrumentation of meteorological satellites. It Discusses the impact of satellites on the development of modern meteorology.

Note that only <u>one</u> of GPHS 424 or GPHS 426 will run, depending on demand.

GPHS 425	CRN 11096	NUMERICAL WEATHER PREDICTION	15 PTS	2/3

NOT RUNNING 2020

Coordinator: Dr Jim McGregor

Numerical Weather Prediction (NWP) is examined within the context of modern weather forecasting. It includes material on the historical development of NWP, wave properties of the governing mathematical equations, numerical methods, model physics, statistical methods in post-processing, ensemble forecasting, and applications of global and limited-area NWP in modern weather forecasting operations.

GPHS 426	CRN 27049	CLIMATOLOGY AND REMOTE SENSING	15 PTS	2/3

Restrictions: GPHS 430 in 2014, PHYG 413

Coordinator: Dr Jim McGregor

This course takes a mathematical approach to understanding climate dynamics, based on the equations of atmospheric motion and energy transport in the large-scale circulation. The second half of the course derives and uses the equation of radiative transfer as a basis for investigating remote sensing of the atmosphere.

Note that only <u>one</u> of GPHS 424 or GPHS 426 will run, depending on demand.

GPHS 441	CRN 9063	SOLID EARTH GEOPHYSICS	15 PTS	1/3

Restrictions: PHYS 406, 441

Coordinator: Dr Gillian Turner

A survey of the internal processes and properties of the Earth including Seismology, Geomagnetism, Gravity Geodynamics, Geothermal Processes and Geochronology. Also taught as PHYS441.

GPHS 445	CRN 9067	OBSERVATIONAL EARTHQUAKE SEISMOLOGY	15 PTS	1/3

Prerequisites: MATH 323

Restrictions: GPHS 409

Coordinator: Dr Calum Chamberlain

This course provides an introduction to observational earthquake seismology and its contribution to the development of Earth models. Students will learn the fundamental concepts and processes of seismic wave generation, propagation, recording and analysis in idealised media and in the real Earth.

GPHS 446	CRN 9068	ADVANCED SEISMOLOGY	15 PTS	2/3

Prerequisites: MATH 323

Restrictions: GPHS 409

Coordinator: Prof Martha Savage

This course provides an introduction to theoretical seismology and the quantitative analysis of Earth structure and earthquake source physics. Topics covered include the mathematical analysis of seismic wave generation and propagation, and the and the construction and analysis of synthetic seismograms. The second half of the course may include some or all of the following: relative earthquake location, seismotectonics, seismic anisotropy, surface wave tomography.

GPHS 447	CRN 9605	GEOMAGNETISM	15 PTS	2/3

Restrictions: PHYS 406, 442, 447

Coordinator: Dr Malcolm Ingham

GPHS 447 covers physical and mathematical description of the geomagnetic field, spectrum of time variations, secular variation, reversals and sea-floor anomalies, origin of the geomagnetic field, introduction to palaeomagnetism, and electromagnetic induction in the Earth. Also taught as PHYS 447.

GPHS 448	CRN 9606	ADVANCED TOPICS IN GEOMAGNETISM	15 PTS	2/3

Restrictions: GPHS 408, GPHS 443, GPHS 444

Coordinator: Dr Malcolm Ingham

GPHS 448 covers a selection of topics from (but not limited to) rock magnetism, palaeomagnetism, electrical/electromagnetic geophysics and satellite geomagnetism.

GPHS 489	CRN 1891	PROJECT	30 PTS	1+2/3

Coordinator: Prof Martha Savage

A research project on a topic approved by the Head of School.

GPHS 520	CRN 27121	PROFESSIONAL WEATHER OBSERVING, ANALYSIS AND SYNOPTIC DIAGNOSIS	30 PTS	1/3

NOT RUNNING 2020

Prerequisites: Permission of Head of School

Restrictions: GPHS 521

Coordinator: Dr Jim McGregor

This course, together with GPHS 521, forms an integrated study of forecasting practice and supporting meteorological theory. Emphasis is placed on the theoretical principles of weather observation, analysis, and diagnosis that underpin weather prediction. Students will actively apply the principles learnt through a variety of simulated exercises.

GPHS 521	CRN 27211	PROFESSIONAL WEATHER DIAGNOSIS AND FORECASTING	30 PTS	1/3

NOT RUNNING 2020

Prerequisites: Permission from Programme Director

Coordinator: Dr Jim McGregor

This course, together with GPHS520, forms an integrated study of forecasting practice and supporting meteorological theory. Emphasis is placed on the theoretical principles of weather diagnostics at synoptic and meso-scales that underpin weather prediction. Students will apply the principles learnt through advanced simulated exercises.

GPHS 589	CRN 27123	RESEARCH PROJECT	30 PTS	1+2+3

Prerequisites: Permission of Head of School

Coordinator: Dr Jim McGregor

This project will be based on a ‘real world’ meteorological research objective selected from a list of research topics arising from meteorological operations at MetService. Students will be encouraged to demonstrate their independence, critical thinking and scientific rigour in their project work. MetService will provide all meteorological data required for the project. Supervision will be by MetService and/or Victoria University staff. Overall guidance and assessment will be by Victoria University staff.

WHO TO CONTACT

Student Services provides a range of services to all students to help you make the most of your time at university. If you have an issue, need guidance to get through your studies, help is available.
www.victoria.ac.nz/students/support

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
Web:	www.victoria.ac.nz/science
Hours:	8.30 am–4.00pm Monday, Wednesday, Thursday, Friday
	9.30 am–4.00pm Tuesday
	(At busy times of the year the office may close at 3.00pm)

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.

Patricia Stein manages all postgraduate students: patricia.stein@vuw.ac.nz	04-463 5982
Johan Barnard, Manager, Student and Academic Services	04-463 5980
A/Prof Gillian Turner, Associate Dean - Academic (Postgraduate)	04-463 6478

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Te Rōpū Āwhina is the on-campus whānau for Māori and Pacific students within the Faculties of Science, Engineering, and Architecture and Design. Āwhina is about people and collective success. The kaupapa of Āwhina is to produce Māori and Pacific science, engineering, architecture and design professionals to contribute to Māori and Pacific community and leadership development.