

## PG Diploma and Masters Water Resource Management (WRM)

### Course Selection for Part 1 (first year)

Both of these degrees can be taken through either Lincoln or Canterbury University, but you will choose your courses differently, depending on the university you have enrolled through. To complete the PG Diploma WRM or Masters WRM Part I programme, you will need a total of at least **120 points** (at UC you can get dispensation to graduate with 115 points if you end up slightly short, but not at LU). Normally the degrees are constructed as described below. Details of these key courses are on page 2. If you wish to do something different, you will need to seek approval from the Waterways Centre.

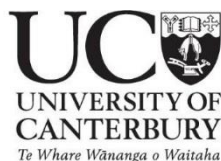


**Lincoln University**  
*Te Whare Wānaka o Aoraki*

**Compulsory core courses:** WATR 601, WATR 602, WATR 603 (all 20 pts each)

**Plus:** At least 30 points from; WATR 605, LWST 602, MAST 603, ERST 621, ERST 630, ERST 632, ECON 606 (all 20 pts each), or you may choose to cross credit one of the following U Canterbury courses: GEOG 404 (30 pts) or ENVR 410 (15 pts). ***It is highly recommended that you take WATR 605 (20 pts) if you have not previously undertaken research and are considering doing a Masters thesis.***

**Plus:** Another course (if needed) from 600-level courses at Lincoln University, to form a coherent programme of water management-relevant study (see page 3 on).



**Compulsory core courses:** WATR 401, WATR 402, WATR 403 (all 15 pts each)

**Plus:** At least 30 points from WATR 405, GEOG 404 (30 pts) and ENVR 410 (15 pts). You may also choose to cross credit one of the Lincoln university courses: LWST 602, MAST 603, ERST 621, ERST 630, ERST 632, ECON 606 (all 20 pts each). ***It is highly recommended that you take WATR 405 (15 pts) if you have not previously undertaken research and are considering doing a Masters thesis.***

**Plus:** Other courses (if needed) from 400-level courses at University Canterbury to form a coherent programme of water management-relevant study (see page 3 on).

## COMPULSORY (CORE) WATR COURSES

| Course Code  | Course Name                           | Semester | Points |
|--------------|---------------------------------------|----------|--------|
| WATR 401/601 | Advanced Water Resources              | One      | 15/20  |
| WATR 402/602 | Water Quality and Quantity Assessment | Two      | 15/20  |
| WATR 403/603 | Water Management, Policy and Planning | Two      | 15/20  |

## 30pts ELECTIVE COURSES LIST

### LU:

| Course Code | Course Name  | Semester | Points |
|-------------|--|----------|--------|
| LWST 602    | Advanced Resource Management and Planning Law                    | Two      | 20     |
| MAST 603    | Mana Kaitiaki (Maori Resource Management)                        | Two      | 20     |
| ERST 621    | Principles of Environmental Impact Assessment                    | Two      | 20     |
| ERST 630    | Environmental Policy and Planning                                | One      | 20     |
| ERST 632    | Economics in Environmental Policy                                | One      | 20     |
| ECON 606    | Natural Resource and Energy Economics <i>not offered in 2019</i> | One      | 20     |
| WATR 605    | Research Methods and Communication                               | One      | 20     |

### UC:

| Course Code | Course Name  | Semester | Points |
|-------------|--|----------|--------|
| GEOG 404    | Resource & Environmental Management in New Zealand | Two      | 30     |
| ENVR 410    | Concepts and Principles of Environmental Science   | One      | 15     |
| WATR 405    | Research Methods and Communication                 | One      | 15     |

## Other Water Management-Relevant Courses at UC and LU

Current for Feb 2018

In order to make up the 120 pts for Part 1, you may choose further postgraduate courses at either the University of Canterbury, or Lincoln University. A list relevant **courses** that may be considered, grouped according to the general discipline in which a student has previously graduated (science, management/commerce or engineering) so given below. Final course selection will be contingent upon you having the required prerequisites for these courses. This list is not exhaustive; there may be new courses of relevance that we are not currently aware of ... if so, please let us know as we will update the list. Your final course selection will be approved by the Director of Waterways Centre as part of your enrolment process, but please feel free to discuss course selection with the Centre's senior tutor prior to enrolment.

**NB. We try to keep this list up to date each year, but courses can be cancelled at short notice. Please check the website of the respective University to confirm a course is being offered.**

### SPECIAL TOPICS

The term “**Special Topic**” covers a variety of courses in which the content/course structure is not fixed from year to year, or even from student to student. There are typically three different types:

- Covers a particular subject which is not publicised and you need to see the course coordinator to find out what this is.
- A one-off topic which is offered because a visiting expert or new lecturer is available to teach in a novel and/or topic area of learning.
- An individually prescribed course of study, often resulting in a dissertation or other type of report. These e courses involve a period of self-directed, supervised research, which can be particularly beneficial for students unable to find what they need within the formal course structure. They are also popular with PG Diploma students who wish to undertake a research project, but are not intending to enrol in a Masters thesis in the near future, and with students studying remotely from outside the Canterbury region.

Enrolment in special topic courses should be discussed with the Director or Senior Tutor of the Waterways Centre in the first instance. In most cases, you will not be able to enrol in a special topic unless you have their approval to do so.

**UC:**

| Course Code | Course Name   | Semester   | Points |
|-------------|---|------------|--------|
| WATR 404    | Special Topic – Integrated Data to Support Water Modelling <i>not offered in 2019</i>         | S1         | 15     |
| ENVR 480    | Research Project  | Whole year | 30     |
| ENCN 499    | Special Topic in Engineering (Hydraulics & Quality of Groundwater) <i>not offered in 2019</i> | S2         | 15     |

|          |                                  |    |    |
|----------|----------------------------------|----|----|
| WATR 404 | Special Topic – Research Project | S2 | 15 |
|----------|----------------------------------|----|----|

LU:

| Course Code | Course Name   | Semester | Points |
|-------------|---|----------|--------|
| WATR 604    | Special Topic – Integrated Data to Support Water Modelling <i>not offered in 2019</i> | S1       | 20     |
| WATR 699    | Special Topic – Research Project  | S1 or S2 | 20     |

## DISCIPLINE COURSES (in alphabetical order)

### ENGINEERING:

UC:

| Course Code | Course Name  | Semester | Points |
|-------------|--|----------|--------|
| ENCI 445    | Environmental Fluid Mechanics <i>not offered in 2019</i> | One      | 15     |
| ENCI 475    | Independent Course of Study                              | Flexible | 15     |
| ENCI 634    | Engineering Chemistry for Water Systems                  | One      | 15     |
| ENCI 638    | Environmental Fluid Dynamics <i>not offered in 2019</i>  | Two      | 15     |
| ENCN 401    | Engineering in Developing Communities                    | One      | 15     |
| ENCN 444    | Water Infrastructure and Design                          | Two      | 15     |
| ENCN 481    | Environmental Engineering Design                         | One      | 15     |
| ENGE 414    | Applied Hydrogeology                                     | One      | 15     |
| ENNR 405    | Ecological and Bioresources Engineering                  | One      | 15     |
| ENNR 422    | Water Resource and Irrigation Engineering *              | Two      | 15     |

*\*please talk to us first if you plan to enrol in ENNR422*

### ENVIRONMENTAL MANAGEMENT, GOVERNANCE, POLICY & LAW:

UC:

| Course Code | Course Name   | Semester   | Points |
|-------------|---|------------|--------|
| GEOG 402    | Resilient Cities  | One        | 30     |
| BCNR 691    | Co-governance Research Project                              | Two        | 60     |
| LAWS 629    | Natural Resource Law  | Whole year | 30+    |
| LAWS 644    | Law and the Environment                                     | Whole year | 30+    |
| POLS 440    | Principles and Practice of Policy and Governance            | One        | 30     |
| POLS 442    | Policy and Governance in Small States of NZ and the Pacific | Two        | 30     |
| POLS 443    | Science, Technology and Environmental Policy                | One        | 30     |

LU:

| Course Code | Course Name                         | Semester | Points |
|-------------|-------------------------------------|----------|--------|
| ERST 601    | Advanced Theory in Resource Studies | One      | 20     |

|          |   |         |    |
|----------|---|---------|----|
| ERST 604 | Advanced Urban, Regional and Resource Planning                            | One     | 20 |
| ERST 620 | Advanced Environmental Management Systems                                 | One     | 20 |
| ERST 622 | Comparative Environmental Policy <i>not offered in 2019</i>               | One/two | 20 |
| ERST 631 | Environmental Sciences in Environmental Policy <i>not offered in 2019</i> | One     | 20 |
| ERST 633 | Integrated Environmental Management <i>not offered in 2019</i>            | Two     | 20 |
| ERST 634 | Applied Policy Analysis   | Two     | 20 |
| ERST 636 | Aspects of Sustainability: An International Perspective                   | Two     | 20 |
| ERST 671 | Environmental Impact Assessment <i>not offered in 2019</i>                | Two     | 20 |
| ERST 672 | Sustainability and Organisations <i>not offered in 2019</i>               | Two     | 20 |

## FORESTRY:

### UC:

| Course Code | Course Name  | Semester | Points |
|-------------|--|----------|--------|
| FORE 444    | Sustaining Biodiversity on Private Land <i>not offered in 2019</i> | Two      | 15     |
| FORE 447    | Environmental Forestry <i>not offered in 2019</i>                  | Two      | 15     |
| FORE 616    | Restoration Ecology  | One      | 30     |
| FORE 633    | Resource Assessment <i>not offered in 2019</i>                     | Two      | 15     |

### LU:

| Course Code | Course Name  | Semester | Points |
|-------------|--|----------|--------|
| FORS 601    | Biophysical relationships in Agroforestry <i>not offered in 2019</i> | TBC      | 20     |

## SOCIAL SCIENCE & ECONOMICS:

### UC:

| Course Code | Course Name   | Semester | Points |
|-------------|---|----------|--------|
| ECON 655    | Environmental Economics   | One      | 15     |
| GEOG 401    | Well-being, Community and Place   | Two      | 30     |
| MAOR 401    | Te Matakahi: Indigenous Critical Theory                                   | One      | 30     |
| MAOR 422    | Topics in Ethnicity, Migration and Nationalism <i>not offered in 2019</i> | One      | 30     |
| MAOR 431    | Comparative Indigenous Models and Theories of Development                 | Two      | 30     |
| POLS 444    | International Human Rights and Development                                | Two      | 30     |

### LU:

| Course Code | Course Name   | Semester | Points |
|-------------|---|----------|--------|
| LASC 615    | Advanced Landscape Planning and Policy                      | One      | 20     |
| SOCI 608    | Advanced International Rural Development                    | Two      | 20     |
| SOCI 641    | Advanced Society and Environment <i>not offered in 2019</i> | Two      | 20     |
| SOCI 626    | Special Topic - Society and Climate Change                  | Two      | 20     |
| IRDV 601    | Development Policy, Theory and Issues                       | Summer   | 20     |
| PSYC 602    | Advanced Social Psychology of Wellbeing                     | Two      | 20     |
| RECN 626    | Natural Resource Recreation and Tourism                     | Two      | 20     |

## RESEARCH METHODS:

Note that you would not normally need to take these, if you are already taking WATR 405/605, unless they cover specific research methods you will need for your proposed thesis topic.

### UC

| Course Code | Course Name  | Semester | Points |
|-------------|--|----------|--------|
| SOCI 402    | Methods and Strategies in Research                                       | One      | 30     |
| GEOG 401    | Well-being, Community and Place  | Two      | 30     |
| MAOR 404    | Rangahau Taketake – Research Methodologies: Indigenising the Disciplines | One      | 30     |

### LU

| Course Code | Course Name                                    | Semester | Points |
|-------------|--|----------|--------|
| ECOL 608    | Research Methods in Ecology                    | One      | 20     |
| SOCI 601    | Social Science research Methods (Quantitative) | One      | 20     |
| SOCI 602    | Social Science research Methods (Qualitative)  | Two      | 20     |

## SCIENCE:

### UC:

| Course Code | Course Name   | Semester   | Points |
|-------------|---|------------|--------|
| BIOL 425    | Freshwater Ecology  | One        | 15     |
| BIOL 426    | Conservation Biology  | Two        | 15     |
| BIOL 490    | Aquaculture <i>not offered in 2019</i>                          | Whole year | 30     |
| BIOL 492    | Environmental Microbiology <i>not offered in 2019</i>           | Whole year | 30     |
| CHEM 421    | Advanced Topics in Chemistry I <i>not offered in 2019</i>       | Whole year | 30     |
| CHEM 422    | Advanced Topics in Chemistry II <i>not offered in 2019</i>      | Whole year | 30     |
| ENVR 411    | Case Studies in Environmental Science                           | Two        | 15     |
| ENVR 414    | Current Issues in Environmental Chemistry                       | Two        | 15     |
| ENGE 414    | Applied Hydrogeology  | One        | 15     |
| GEOL 477    | Sediment Transport and Deposition <i>not offered in 2019</i>    | Two        | 15     |
| GEOG 409    | Coasts and Rivers: from natural processes to urban environments | One        | 30     |
| GEOG 412    | Alpine and Polar Environments                                   | Two        | 30     |
| GISC 403    | Cartography and Geovisualisation                                | Two        | 15     |
| GISC 404    | Spatial Analysis  | One        | 15     |
| GISC 405    | GIS Programming and Databases                                   | One        | 15     |
| GISC 406    | Remote Sensing for Earth Observation                            | One        | 15     |
| GISC 413    | Geomatic Data Acquisition Techniques                            | Two        | 15     |
| PHYS 419    | Atmospheric, Oceanic and Climate Dynamics                       | Two        | 15     |
| PHYS 446    | Geophysical Fluid Dynamics <i>not offered in 2019</i>           | One        | 15     |

### LU:

| Course Code | Course Name   | Semester | Points |
|-------------|---|----------|--------|
| BIOS 601    | Integrated Management of Pastoral Systems <i>not offered in 2019</i>      | TBA      | 20     |
| BIOS 604    | Advanced Toxicology A   | One      | 20     |
| COMP 622    | Computer Modelling of Environmental Systems                               | Two      | 20     |
| ECOL 609    | Conservation Biology  | One      | 20     |
| ECOL 631    | Animal Behaviour  | One      | 20     |
| ECOL 612    | Wildlife Management   | Two      | 20     |
| ERST 631    | Environmental Sciences in Environmental Policy <i>not offered in 2019</i> | One      | 20     |
| ERST 606    | Advanced Geographic Information Systems A                                 | One      | 20     |
| ERST 607    | Advanced Geographic Information Systems B                                 | Two      | 20     |
| ERST 611    | Advanced Environmental Monitoring <i>not offered in 2019</i>              | One      | 20     |
| MICR 604    | Advanced Microbiology   | One      | 20     |
| PLPT 621    | Env Impacts of Pest Management <i>not offered in 2019</i>                 | Two      | 20     |
| QMET 602    | Mathematical modelling of Dynamic Systems <i>not offered in 2019</i>      | One      | 20     |
| SOSC 628    | Soil Chemistry  | Two      | 20     |
| SOSC 629    | Soil Physics  | One      | 20     |
| SOSC 630    | Soil Fertility and Management   | One      | 20     |

## EXTERNAL COURSES:

Courses offered at other universities can be cross-credited to a WRM degree, if they are relevant to the field of water resource management and do not duplicate the content of courses already included in, or being taken as part of, the WRM degree.

Some of the courses that we know of, that compliment freshwater courses available here, or have been taken by our students in the past, are listed below. Clearly there are likely to be many others that are of relevance and we are building up this database. Please talk to us if you are based out of Christchurch and wish to cross credit courses from your local or nearest university.

| University | Course Code | Course Name   | Semester | Points | Distance learning? |
|------------|-------------|---|----------|--------|--------------------|
| Massey     | 145.731     | Applied Fluvial Geomorphology                             | One      | 15     | Y                  |
|            | 235.703     | Māori Resource and Environmental Management - Fresh Water | One      | 15     | Y                  |
|            |             |   |          |        |                    |
| Auckland   | BIOSCI 749  | Ecology of Microbial Interactions                         | Two      | 15     | N                  |
|            | ENVSCI 738  | Water and Society   | One      | 15     | N                  |
|            |             |   |          |        |                    |
| Waikato    | BIOL 561    | Ecosystem Modelling                                       | Two      | 15     | N                  |
|            | BIOL 564    | Restoration Ecology                                       | Two      | 15     | N                  |
|            | BIOL 577    | Aquatic Toxicology  | Two      | 15     | N                  |