

# WATR7100 - Catchment and aquatic ecosystem health (2 units)

## Integration module

### Course description

The Catchment and aquatic ecosystem health course provides students with an in-depth understanding of the issues and challenges relating to the sustainable management of aquatic ecosystems. The study of aquatic ecosystem health is a relatively new field that brings together biophysical understandings of how natural systems function with societal goals and human values. A major challenge for society is to satisfy the growing demands for water without degrading aquatic ecosystems and the ecological goods and services they provide. The course will focus on three key components:

- an understanding of hydrological regimes and environmental flows methodology, including the basic principles relating hydrology to aquatic ecosystems and the design of environmental flows regimes;
- theory and methodology behind the assessment of aquatic ecosystem health, including the development and validation of cost-effective techniques for the ecological assessment of river health; and
- principles and practical tools for implementing riparian restoration projects across a range of aquatic ecosystems.

### Course introduction

The aim of this course is to take a whole-of-water-cycle approach to ecosystem health and catchment management. Students will gain an understanding of catchment hydrology, riparian restoration and ecosystem health.



Throughout the course there is an emphasis on the whole-of-water-cycle and adaptive management approaches. Students will be exposed to both the theoretical and practical components of the course content, they will participate in a field trip which will include hands-on measurement of ecosystem health and explore the outcomes of riparian restoration.

### Course delivery

- **Full-time** (on-campus) students, including international students, are required to enrol in the internal offering in Semester 2. The majority of this course takes place during an intensive 14-day [field trip in Albany, Western Australia](#), at the beginning of Semester 2.
- **Part-time** (external) students are required to enrol in this course in Semester 2. They are also required to attend the 14-day [field trip in Albany, Western Australia](#) where the majority of this course will be delivered.

### Assumed background

The following modules are pre-requisites for this course: WATR7000 and WATR7001.

### Learning objectives

After successfully completing this course, students should be able to:

- be able to describe basic hydrology of catchments, and physical processes within catchments. An understanding of basic catchment hydrology is important in understanding water quality, linkages between the terrestrial and aquatic environment, the influence of land-use change on aquatic systems, reservoir function and water treatment needs and environmental flows;
- have a basic understanding of environmental flows technologies and methodologies with respect to natural research management;
- understand the concepts behind riparian restoration in relation to whole of catchment management;
- have a basic understanding of the concepts and practices of ecosystem health;
- have improved (1) their ability to manage their own study and (2) their ability to work effectively in teams including the ability of the student to: reflect on own learning and improve study approaches on the basis of this learning; work in a team to solve a large complex problem and communicate the solution effectively; and identify and overcome issues/problems in a



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team to make the team result better than the sum of the individuals;

- participate successfully in an integrated group project exploring detailed aspects of integrated water management;
- participate successfully in an individual project that integrates the knowledge obtained from the core classes;
- demonstrate the use of personal reflection and social learning to improve their own ability, and their ability as part of a team, to analyse and explore integrated solutions to practical water planning and management problems exemplified in case studies presented in this course;
- show how relevant theories, integration tools and decision support systems presented in this course can inform the analysis of case studies and help to identify practical, integrated solutions to water planning and management problems.

## Teaching staff

**Course Coordinator:** [Dr Steven Pratt](#) (The University of Queensland)

**Lead Lecturer:** [Dr Peter Speldewinde](#) (The University of Western Australia)

**Lead Lecturer:** [Dr Barbara Cook](#) (The University of Western Australia)

**Lecturer:** [Prof Peter Davies](#) (The University of Western Australia)

## Problem-Based Learning (PBL) projects

Parallel PBL projects and field trips will run through the semester, comprising roughly 50% of the total contact time and assessment weight for the Integration semester. These enable students to develop skills that complement the content delivered in the four co-requisite courses: WATR7100, WATR7200, WATR7300, WATR7400. Please see other co-requisite course profiles to cross-reference.

The majority of this module takes place during an intensive 14-day [field trip in Albany, Western Australia](#), at the beginning of Semester 2.

The PBL stream for the Integration semester comprises an individual project and a group project conducted in multidisciplinary teams:

- **PBL3:** Development of an implementation plan for increasing water recycling in the lower Great Southern (Group project)
- **PBL4:** Critical assessment of Australian integrated water management learnings and application in a developing country context (Individual project)

## Field trips

Students begin the Integration semester with a two-week field trip to [The University of Western Australia's Centre of Excellence in Natural Resource Management in Albany](#), south Western Australia. The cost of the trip is covered in course fees.

For a complete list of field trips that students undertake during the Integration semester, please refer back to "Field trips" on page 4 of this syllabus or visit [IWC website](#).



Photos of students on a field trip to Western Australia.