

WATR7400 – Water and sanitation (2 units)

Integration module (Stream no.1: International development)

Course description

The Water and sanitation course provides students with an understanding of both social and engineering principles and tools for designing, building and operating water and sanitation systems in developing country contexts. Key topics include the environmental health basis of work in this sector; key principles, approaches and technologies for environmental sanitation, including decentralised excreta disposal, simplified sewerage and solid waste management; principles of water supply including water quality, quantity affordability and sustainability; groundwater abstraction through wells and springs; surface water and rainwater use; water treatment process technologies; water lifting and distribution; and operation and maintenance of water supply and sanitation infrastructure.

Due attention is given to non-engineering aspects of water and sanitation systems, including tools for demand creation and management and cost-benefit analysis of options.

Course introduction

This course provides students with engineering and socio-economic principles and tools for designing and operating water and sanitation systems that are sustainable, appropriate and affordable for poor communities in developing countries.

Course delivery

- **Full-time** (on-campus) students, including international students, are required to enrol in the internal offering in Semester 2.
- **Part-time** (external) students are required to enrol in this module in Semester 2 or Semester 4. These semesters begin with an intensive face-to-face session or field trip and the remainder of the course is taught externally on-line.





IWC Graduates receive a co-badged degree from four leading Australian universities, ranked amongst the top 1% of the best universities in the world for teaching and research. (QS Global Ranking)

Assumed background

The following modules are pre-requisites for this course: WATR7000, WATR7001, WATR7002 and WATR7003.

Learning objectives

After successfully completing this course students should be able to:

- demonstrate understanding of the socio-economic principles underlying sustainable development of appropriate water supply and sanitation facilities in low-income contexts;
- show knowledge of the range of suitable technologies for the delivery and management of water supply in low- and middle-income countries;
- explain the principles involved in designing water supply systems;
- demonstrate understanding of the elements of low cost sanitation systems, their function, design and modes of operation in both urban and rural settings;
- show knowledge of disasters and emergencies around the world and of how water and sanitation needs can be provided for;
- define environmental health and epidemiological transitions;
- analyse the inter-relationship between ecosystem services and human disease burden;
- demonstrate an understanding of surveillance and risk assessment in an ecological context;
- 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 ability, individually and 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: [Mr Ben Fawcett](#) (The University of Queensland)

Lecturer: [Dr Paul Jagals](#) (The University of Queensland)

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 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.

As part of this module (WATR7400 - Water and sanitation), students also undertake:

- two days of field experience in well digging (Pinjarra Hills, Queensland)
- half-day field trip to South Bank Stormwater Harvesting and Reuse Centre (Brisbane, Queensland)

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

