ENEN90029 Water and Waste Water Management

Credit Points:	12.5
Level:	9 (Graduate/Postgraduate)
Dates & Locations:	2015, Parkville This subject commences in the following study period/s: Semester 1, Parkville - Taught on campus.
Time Commitment:	Contact Hours: 54 hours, comprising of one 2 hour lecture and one 2 hour workshop per week; one 6-hour practical site visit. Total Time Commitment: 200 hours
Prerequisites:	None
Corequisites:	None
Recommended Background Knowledge:	Admission to post graduate studies in Engineering OR

Subject	Study Period Commencement:	Credit Points:
CVEN30010 Systems Modelling and Design	Semester 2	12.50

Non Allowed Subjects:

Students cannot enrol in and gain credit for this subject and:

Subject	Study Period Commencement:	Credit Points:
421-640 Water Supply and Waste Water Management	Not offered 2010	

OR

Subject	Study Period Commencement:	Credit Points:
421-605 Managing Water Borne Risks	Not offered 2010	

Core Participation Requirements:	For the purposes of considering request for Reasonable Adjustments under the Disability Standards for Education (Cwth 2005), and Student Support and Engagement Policy, academic requirements for this subject are articulated in the Subject Overview, Learning Outcomes, Assessment and Generic Skills sections of this entry. It is University policy to take all reasonable steps to minimise the impact of disability upon academic study, and reasonable adjustments will be made to enhance a student's participation in the University's programs. Students who feel their disability may impact on meeting the requirements of this subject are encouraged to discuss this matter with a Faculty Student Adviser and Student Equity and Disability Support: http://services.unimelb.edu.au/disability
Coordinator:	Dr Meenakshi Arora
Contact:	Dr. Meenaskshi Arora **marora@unimelb.edu.au (mailto:marora@unimelb.edu.au)**
Subject Overview:	**AIMS** In this subject students will learn about the fundamentals of water quality and the associated standards for use as potable water, recycled water or discharge into the environment in a sustainable manner. The subject will include the identification of risks and measures to control those risks and various treatment processes including physical, chemical and microbiological treatment of water and wastewater. The concept of integrated water management will be introduced and reinforced in the group based project work throughout the semester. Students

	will learn about the systems for water reclamation and reuse. This subject builds on a range of student's general knowledge of water systems engineering that is developed in subjects like Systems Modelling and Design and builds on general knowledge of chemistry and biology. It is also assumed that students have developed skills on identifying and sourcing information, and can effectively work as a team to solve larger problems. Graduates from this subject may apply the skills developed in the water supply, waste water treatment, or water sensitive urban design areas. **INDICATIVE CONTENT** This subject covers theoretical and practical management aspects of sustainable water supply and treatment, wastewater treatment and reuse. Specific topics include: # Integrated water management # Risk identification and management for water services # Water quality guidelines, regulations and performance criteria for treatment plant design # Water treatment processes and waste disposal # Wastewater treatment - physical, chemical and biological treatment technologies # Systems for water reclamation and reuse. The students will produce a conceptual design of a water and wastewater treatment system for a small town.
Learning Outcomes:	**INTENDED LEARNING OUTCOMES (ILO)** Having completed this subject the student is expected to: 1 Interpret raw and treated water quality data to assess its suitability for potential use in potable or recycled water supply systems and the environment 2 Interpret water quality guidelines and regulations to set water quality targets and performance criteria for treatment plant design 3 Assess the need for water treatment, describe suitable water treatment processes and develop a water quality management plan 4 Conduct a water quality risk assessment and propose a rational approach to water treatment process design providing "multiple barriers" to mitigate identified risks 5 Appreciate practical issues such as flow and energy losses of water in pipes, variability of feed water (raw water) quality; water treatment process constraints; and cost implications 6 Integrate a water treatment facility within a water supply system 7 Knowledge of various treatment techniques for water, wastewater and recycled water.
Assessment:	A group assignment task, totalling 3000 words, due at week 6 of semester, requiring approximately 15 -20 hours of work per student (15%). Associated with Intended Learning Outcomes (ILOs) 1-3. A group assignment task, totalling 6000 words, due at week 11 of semester, requiring approximately 45-50 hours of work per student (35%). Associated with ILOs 4-6. One 2-hour examination, held in the examination period (50%). Associated with ILOs 1-7.
Prescribed Texts:	None
Breadth Options:	This subject is not available as a breadth subject.
Fees Information:	Subject EFTSL, Level, Discipline & Census Date, http://enrolment.unimelb.edu.au/fees
Generic Skills:	# Ability to undertake problem identification, formulation, and solution # Understanding of social, cultural, global, and environmental responsibilities and the need to employ principles of sustainable development # Capacity for creativity and innovation # Understanding of professional and ethical responsibilities, and commitment to them # Capacity for lifelong learning and professional development # Work effectively in a team.
Notes:	**LEARNING AND TEACHING METHODS** The subject is based on presentations by experienced industry professionals who present the lectures and case studies. The subject also involves problem based learning by doing a group project on conceptual design of integrated water and wastewater treatment plan. **INDICATIVE KEY LEARNING RESOURCES**

	1 John C. Crittenden, R. Rhodes Trussell, David W. Hand, Kerry J. Howe, George Tchobanoglous, *MWH's Water Treatment: Principles and Design*, 3rd Edition, ISBN: 978-0-470-40539-0, Hardcover, 1920 pages, March 2012 2 Wastewater Engineering by Metcalf & Eddy 3 State Environment Protection Policy, SEPP **http://epanote2.epa.vic.gov.au/EPA/Publications.NSF/2f1c2625731746aa4a256ce90001cbb5/cc4efb1a742644514a2565fc0008e5cc/$FILE/S160.pdf (http://epanote2.epa.vic.gov.au/EPA/Publications.NSF/2f1c2625731746aa4a256ce90001cbb5/cc4efb1a742644514a2565fc0008e5cc/$FILE/S160.pdf)** **CAREERS / INDUSTRY LINKS** Presenters from water industry deliver the lectures and case studies with focus on industry problems. Students' learning is enhanced by problem based learning and by completing a concept design of an integrated water and wastewater management project. Site visits are undertaken to enhance students understanding of operating environment of a water treatment plant and sewage treatment plant and recycled water treatment plant. The subject provides industry exposure and prepares students well for their career and work in professional engineering world.
Related Course(s):	Master of Environmental Engineering Master of Philosophy - Engineering Ph.D.- Engineering
Related Majors/Minors/ Specialisations:	B-ENG Civil Engineering stream Master of Engineering (Civil) Master of Engineering (Environmental) Tailored Specialisation Tailored Specialisation Waste Management Waste Management