



The University of Southern Queensland

## Course specification

The current and official versions of the course specifications are available on the web at <http://www.usq.edu.au/coursespecification/current>.  
Please consult the web for updates that may occur during the year.

### Description: Public Health Engineering

Subject	Cat-nbr	Class	Term	Mode	Units	Campus
ENV	4203	90332	2, 2009	ONC	1.00	Toowoomba

<b>Academic group:</b>	FOENS
<b>Academic org:</b>	FOES03
<b>Student contribution band:</b>	2
<b>ASCED code:</b>	030907

### STAFFING

Examiner: Vasanthadevi Aravinthan

Moderator: Ian Brodie

### REQUISITES

Pre-requisite: ENV1101 or ENV2103 or Students must be enrolled in one of the following Programs: GCEN or GDET or METC or MEPR

### SYNOPSIS

An efficient water supply and distribution system, a reliable supply of potable water, an appropriate system of wastewater collection, treatment and disposal, and an effective municipal solid waste management are essential for the health and well being of modern urban communities. The design, installation, operation and maintenance of these facilities are traditionally the responsibilities of local government engineers or consulting engineers employed by local government. This course therefore includes the modules on water supply and distribution system, conventional and advanced water treatment processes, wastewater treatment, sludge and solid waste treatment. In order to understand the principles and processes of water and wastewater treatment, there is a need to appreciate the vectors of waterborne diseases, microbiology, as well as topics in water chemistry. Environmental matters (notably solid refuse management) and legislation likely to be included in the responsibilities of a local government engineer are also included in this course.

### OBJECTIVES

The course objectives define the student learning outcomes for a course. The assessment item(s) that may be used to assess student achievement of an objective are shown in parenthesis. On completion of this course, students should be able to:

1. understand the global and local distribution of water resources, describe available sources of supply, apprise the water demand, explain the factors leading to water scarcity and measures taken to combat the water shortage; (2 Hour Restricted Examination)
2. describe the essential components of a water supply and distribution system and design the capacities of trunk mains and service reservoirs in a reticulation network; (Assignment 1; 2 Hour Restricted Examination)

3. understand the relevant principles of fundamental water chemistry and microbiology, describe the physical, chemical and biological characteristics of water which are of significance to urban water quality management and understand the guidelines for drinking water quality; (2 Hour Restricted Examination)
4. understand the overview of conventional water treatment processes and modern trends in advanced water treatment; (2 Hour Restricted Examination)
5. understand and design the various components involved in a typical water treatment processes; (Assignment 1; 2 Hour Restricted Examination)
6. describe the objectives of wastewater collection and treatment, understand the sources of wastewater and contaminants, design a wastewater collection system (sewer network) for a subdivision; (Assignment 2; 2 Hour Restricted Examination)
7. understand the characteristics of wastewater and the measurements of them; (2 Hour Restricted Examination)
8. describe the processes involved in primary, secondary and tertiary treatment of wastewater and design attached and suspended wastewater treatment processes; (2 Hour Restricted Examination)
9. describe sludge treatment and disposal methods; (2 Hour Restricted Examination)
10. describe the collection, storage, management and disposal of solid refuse; (2 Hour Restricted Examination)
11. apply the state guidelines for water supply and sewerage schemes and recognise the relevant legislations; (Assignment 1 and 2; 2 Hour Restricted Examination)

## TOPICS

Description	Weighting (%)
1. Urban water and wastewater management	5.00
2. Water supply and distribution system	10.00
3. Water chemistry and microbiology	5.00
4. Overview of conventional and modern water treatment processes	10.00
5. Design of typical water treatment processes	20.00
6. Wastewater collection systems	10.00
7. Characteristics and measurement of wastewater	5.00
8. Wastewater treatment processes	25.00
9. Sludge treatment and disposal methods	5.00
10. Municipal solids waste management	5.00

## TEXT and MATERIALS required to be PURCHASED or ACCESSED

ALL textbooks and materials are available for purchase from USQ BOOKSHOP (unless otherwise stated). Orders may be placed via secure internet, free fax 1800642453, phone 07 46312742 (within Australia), or mail. Overseas students should fax +61 7 46311743, or phone +61 7 46312742. For costs, further details, and internet ordering, use the 'Textbook Search' facility at <http://bookshop.usq.edu.au> click 'Semester', then enter your 'Course Code' (no spaces).

*ENG4203 Public Health Engineering External Study Package*, USQ Publication, Toowoomba.

A hand held battery operated calculator which does not have text storage capabilities

## REFERENCE MATERIALS

Reference materials are materials that, if accessed by students, may improve their knowledge and understanding of the material in the course and enrich their learning experience.

Davis, MI & Cornwell, DA 2006, *Introduction to environmental engineering*, 4th edn, McGraw-Hill, USA.

Hammer, MJ & Hammer Jnr, MJ 2003, *Water and Wastewater Technology*, 5th edn, Prentice Hall, New Jersey.

Metcalf & Eddy, Inc 2003, *Wastewater Engineering Treatment: Disposal and Reuse*, 4th edn, McGraw Hill, Boston.

Twort, AC, Law, FM, Growley, FW & Ratnayaka, DD 1994, *Water Supply*, 4th edn, Edward Arnold, London.

Walski, TM, Chase, DV & Savic, DA 2001, *Water distribution modelling*, 1st edn, Haestad Press, Waterbury, USA.

## STUDENT WORKLOAD REQUIREMENTS

ACTIVITY	HOURS
Assessments	20.00
Examinations	2.00
Lectures	46.00
Private Study	81.00
Tutorials	6.00

## ASSESSMENT DETAILS

Description	Marks out of	Wtg (%)	Due date
ASSIGNMENT 1	100.00	10.00	17 Aug 2009
ASSIGNMENT 2	100.00	10.00	14 Sep 2009
2 HOUR RESTRICTED EXAMINATION	800.00	80.00	END S2 (see note 1)

### NOTES

1. Student Administration will advise students of the dates of their examinations during the semester.

## IMPORTANT ASSESSMENT INFORMATION

### 1 Attendance requirements:

It is the students' responsibility to attend and participate appropriately in all activities (such as lectures, tutorials, laboratories and practical work) scheduled for them, and to study all material provided to them or required to be accessed by them to maximise their

- chance of meeting the objectives of the course and to be informed of course-related activities and administration.
- 2 Requirements for students to complete each assessment item satisfactorily:  
To satisfactorily complete an individual assessment item a student must achieve at least 50% of the marks or a grade of at least C-. (Depending upon the requirements in Statement 4 below, students may not have to satisfactorily complete each assessment item to receive a passing grade in this course.)
  - 3 Penalties for late submission of required work:  
If students submit assignments after the due date without extenuating circumstances then a penalty of 5% of the assigned mark may apply for each working day late up to a maximum of ten working days at which time a mark of zero can be recorded for that assignment.
  - 4 Requirements for student to be awarded a passing grade in the course:  
To be assured of receiving a passing grade in a course a student must obtain at least 50% of the total weighted marks for the course.
  - 5 Method used to combine assessment results to attain final grade:  
The final grades for students will be assigned on the basis of the weighted aggregate of the marks (or grades) obtained for each of the summative assessment items in the course.
  - 6 Examination information:  
In a Restricted Examination, candidates are allowed access to specific materials during the examination. The only materials that candidates may use in the restricted examination for this course are: writing materials (non-electronic and free from material which could give the student an unfair advantage in the examination); calculators which cannot hold textual information (students must indicate on their examination paper the make and model of any calculator(s) they use during the examination).
  - 7 Examination period when Deferred/Supplementary examinations will be held:  
Any Deferred or Supplementary examinations for this course will be held during the examination period at the end of the semester of the next offering of this course.
  - 8 University Regulations:  
Students should read USQ Regulations 5.1 Definitions, 5.6. Assessment, and 5.10 Academic Misconduct for further information and to avoid actions which might contravene University Regulations. These regulations can be found at the URL <http://www.usq.edu.au/corporateservices/calendar/part5.htm> or in the current USQ Handbook.

## **ASSESSMENT NOTES**

- 1 The due date for an assignment is the date by which a student must despatch the assignment to the USQ. The onus is on the student to provide proof of the despatch date, if requested by the Examiner.
- 2 Students must retain a copy of each item submitted for assessment. This must be despatched to USQ within 24 hours if required by the Examiner.
- 3 In accordance with University's Assignment Extension Policy (Regulation 5.6.1), the examiner of a course may grant an extension of the due date of an assignment in extenuating circumstances.
- 4 The Faculty will normally only accept assessments that have been written, typed or printed on paper-based media.
- 5 The Faculty will NOT accept submission of assignments by facsimile.

- 6 Students who do not have regular access to postal services or who are otherwise disadvantaged by these regulations may be given special consideration. They should contact the examiner of the course to negotiate such special arrangements.
- 7 In the event that a due date for an assignment falls on a local public holiday in their area, such as a Show holiday, the due date for the assignment will be the next day. Students are to note on the assignment cover the date of the public holiday for the Examiner's convenience.
- 8 Students who have undertaken all of the required assessments in a course but who have failed to meet some of the specified objectives of a course within the normally prescribed time may be awarded one of the temporary grades: IM (Incomplete - Make up), IS (Incomplete - Supplementary Examination) or ISM (Incomplete -Supplementary Examination and Make up). A temporary grade will only be awarded when, in the opinion of the examiner, a student will be able to achieve the remaining objectives of the course after a period of non directed personal study.
- 9 Students who, for medical, family/personal, or employment-related reasons, are unable to complete an assignment or to sit for an examination at the scheduled time may apply to defer an assessment in a course. Such a request must be accompanied by appropriate supporting documentation. One of the following temporary grades may be awarded IDS (Incomplete - Deferred Examination; IDM (Incomplete Deferred Make-up); IDB (Incomplete - Both Deferred Examination and Deferred Make-up).

## **OTHER REQUIREMENTS**

- 1 Students can expect that questions in assessment items in this course may draw upon knowledge and skills that they can reasonably be expected to have acquired before enrolling in the course. This includes knowledge contained in pre-requisite courses and appropriate communication, information literacy, analytical, critical thinking, problem solving or numeracy skills. Students who do not possess such knowledge and skills should not expect to achieve the same grades as those students who do possess them.
  - 2 Students can expect that questions in assessment items in this course may draw upon knowledge and skills that they can reasonably be expected to have acquired before enrolling in the course. This includes knowledge contained in pre-requisite courses and appropriate communication, information literacy, analytical, critical thinking, problem solving or numeracy skills. Students who do not possess such knowledge and skills should not expect to achieve the same grades as those students who do possess them.
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