School of Civil and Environmental Engineering

TERM 1, 2020

CVEN9855 WATER AND WASTEWATER ANALYSIS AND QUALITY REQUIREMENTS

COURSE DETAILS

Units of Credit	6	
Contact hours	4 hours per week	
Field Trip	Monday, 14:00 – 18:00 (week 2)	Centennial Parklands
Laboratory Workshops	Monday, 14:00 – 18:00 (weeks 3 and 4)	Room: Vallentine Annexe (H22), G20
Classes and Workshops	Monday, 14:00 – 18:00 (weeks 1, 5, 7-8, 10-11)	Room: Civil Engineering (H20), G1
Course Coordinator and Lecturer	Dr Richard Collins email: richard.collins@unsw.edu.au office: Room 103, Vallentine Annexe (H22) (UNSW Water Research Centre) phone: (02) 9385 5214	
Lecturer	Prof Richard Stuetz email: r.stuetz@unsw.edu.au office: Room 304, Civil Engineering (H20) phone: (02) 9385 5944	

INFORMATION ABOUT THE COURSE

This course will address the presence and implications of impurities in water and wastewater. It will consider both chemical and microbial substances that may contaminate various types of waters. Specific attention will be devoted to analytical methods for the detection and monitoring of water and wastewater contaminants.

HANDBOOK DESCRIPTION

The effects of impurities in water and wastewater on its suitability for various beneficial uses, and methods used for detecting impurities. Analytical methods used in water and wastewater treatment for monitoring and processes.

See link to virtual handbook*:*

http://www.handbook.unsw.edu.au/postgraduate/courses/2020/CVEN9855.html

OBJECTIVES

The objective of the course is to provide students with a sound understanding of Australian water quality standards. The course is intended to equip students with advanced knowledge of sampling, laboratory and online analytical methods used for water analysis and quality assessment. With this, students are expected to be able to properly understand, analyse and interpret chemical and microbiological water quality data.

The assessment tasks developed for this course have been designed to develop the following program attributes:

- An in-depth engagement with the relevant disciplinary knowledge in its inter-disciplinary context
- Capacity for analytical and critical thinking and for creative problem solving
- Ability to engage independent and reflective learning
- Information literacy

TEACHING STRATEGIES

Specific teaching and learning strategies include the following:

Private Study	• Review lecture material and additional reading • Complete assignments • Join Moodle discussions of problems • Reflect on workshop problems and assignments • Download materials from Moodle • Keep up with notices and find out marks via Moodle
Classes and Workshops	• Find out what you must learn • Summarise essential course material from lectures and associated reading • Hear announcements on course changes • Be guided by discussion questions and additional reading • Practice solving set problems • Ask questions
Assessments	• Enhance your knowledge by undertaking necessary research to complete these tasks • Demonstrate your knowledge and skills • Demonstrate higher understanding and problem solving • Do not copy sections from textbooks, always use appropriate references for sourced material
Field Work	• Hands-on activities to set lecture materials and other studies in context • Students must record field results and complete a report with these findings discussed.
Laboratory Work	• Hands-on activities to set lecture materials and other studies in context • Students must record laboratory results and complete a report with these findings discussed.

EXPECTED LEARNING OUTCOMES

This course is designed to address the learning outcomes below and the corresponding Engineers Australia Stage 1 Competency Standards for Professional Engineers as shown. The full list of Stage 1 Competency Standards may be found in Appendix A.

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

Learning Outcome		EA Stage 1 Competencies
LO1	*Describe the rationale for water quality monitoring and guidelines*	*PE1.1, PE1.3*
LO2	*Demonstrate advanced knowledge on sampling, instrumentation and methodology used to assess water quality*	*PE1.1, PE1.2, PE1.3, PE1.4*
LO3	*Undertake independent study of relevant literature through on-line resources*	*PE1.2, PE2.2, PE2.3, PE3.1, PE3.2, PE3.5,*
LO4	*Demonstrate the ability to analyse water quality data and prepare concise reports on its meaning*	*PE1.1, PE1.2, PE1.3, PE3.1, PE3.2, PE3.5*

For each hour of contact it is expected that you will put in at least an equivalent amount of time of private study.

COURSE PROGRAM

TERM 1 2020

Date	Topic	Lecturer
17/02/2020 (Week 1)	Course introduction; rationale for water quality monitoring; national water quality guidelines; field trip preparation.	Richard Collins **(Field Trip Quiz [5%])**
24/02/2020 (Week 2)	Field trip - water sampling (Centennial Parklands)	Richard Collins **(Laboratory Quiz [5%])**
02/03/2020 (Week 3)	Laboratory Class I (water analyses and sample preparation)	Richard Collins **(Water Quality Guidelines Quiz [5%])**
09/03/2020 (Week 4)	Laboratory Class II (water analyses and sample preparation)	Richard Collins **(Virtual Laboratory Quiz [5%])**
16/03/2020 (Week 5)	Instrumentation for water quality analyses	Richard Collins
(Week 6)	***No classes - field trip/flexibility week*** **(Assignment 1 Released)**	
30/03/2020 (Week 7)	Analysing water quality data (statistics)	Richard Collins
06/04/2020 (Week 8)	Microbiology and microbiological analyses	Richard Collins
13/04/2020 (Week 9)	***Easter Monday Public Holiday – class rescheduled to Week 11***	
20/04/2020 (Week 10)	Odour analyses	Richard Stuetz **(Assignment 1 Due [40%])**

27/04/2019 (Week 11)	Online (continuous monitoring) analytical techniques	Richard Stuetz

ASSESSMENT

The assessment components have been designed to assess each student's understanding of the course material and their ability to understand, create, analyse and interpret water quality analytical data. The final examination will constitute 40% of the overall course mark. The remaining 60% is comprised of marks from online quizzes and one assignment, as shown in detail below.

The online Quizzes (20% of overall course mark) will assess students understanding of fundamental information covered in the course from weeks 1 to 4. Students who perform poorly in these quizzes and who struggle with the course content are recommended to discuss progress with the course coordinator as soon as possible (i.e. before the UNIVERSITY CENSUS DATE – 15th March 2019).

Assignment 1, the Water Quality Report (40% of overall course mark), is an independent assignment to be completed by all students. It will test the students' understanding of laboratory reporting and data interpretation skills. Students who are unable to attend the field trip and laboratory classes will still be able (and required) to complete this report. All necessary information to achieve this will be provided to all students. Key marking criteria include demonstration of capacity for critical thinking, understanding of concepts presented in lectures, evidence of independent research, the relevance of information presented and the use of a logical and cohesive technical report writing style. A marking rubric will be provided with the assignment when it is released in week 6.

The Exam (40% of overall course mark) will be a 2-hour closed book exam during the normal exam period and will focus on testing students understanding of the material presented throughout the course. The questions in the exam will generally be similar to the exercises provided in the course.

The Exam date is set by the Exams Team and will be confirmed in Week 8 of the term. You will be able to access the time and date of the exam via MyUNSW.

The final grade for this course will be based on the sum of the scores from each of the assessment tasks. A mark of at least 40% (i.e. 16/40) in the final examination is required before the class work (quizzes and assignment 1) is included in the final mark. The formal exam scripts will not be returned but you are permitted to view the marked script.

Distance Students: All Distance students are expected to sit their final examination on Kensington campus (Sydney). If you reside further than 40 km from the Kensington campus, and you wish to sit your exam externally (by distance), you must register for an external exam by the UNIVERSITY CENSUS DATE (Term 1: 15th March 2020). More information can be found *here.*

Supplementary Examinations for Term 1 2020 will be held on Monday 25th – Friday 29th May (inclusive) should you be required to sit one. You are required to be available during these dates. Please do not to make any personal or travel arrangements during this period.

PENALTIES

Quizzes not undertaken before the due date and time will be assigned 0 marks. Late submission of the assignment will receive a 10% penalty (i.e. 4 of 40 marks) per day or part thereof. The deadline for absolute fail (0 marks) for the assignment is 7 days after the submission deadline.

Any requests for extensions or special consideration need to be submitted through the special considerations portal on myUNSW. Further information describing this process is described here: https://student.unsw.edu.au/special-consideration

RELEVANT RESOURCES

There are no specific textbooks recommended for this course. However, relevant reading, databases and internet sites will be provided on UNSW Moodle with each lecture.

DATES TO NOTE

Refer to MyUNSW for Important Dates available at:

https://student.unsw.edu.au/dates

PLAGIARISM

Beware! If your assignment includes plagiarised material it will receive a 0% Fail, and students who plagiarise may fail the course. Students who plagiarise are also liable to disciplinary action, including exclusion from enrolment.

Plagiarism is the use of another person's work or ideas as if they were your own. When it is necessary or desirable to use other people's material you should adequately acknowledge whose words or ideas they are and where you found them (giving the complete reference details, including page number(s)). The Learning Centre provides further information on what constitutes Plagiarism at:

https://student.unsw.edu.au/plagiarism

ACADEMIC ADVICE

For information about:

- Notes on assessments and plagiarism,
- School policy on Supplementary exams,
- Special Considerations: student.unsw.edu.au/special-consideration
- Solutions to Problems,
- Year Managers and Grievance Officer of Teaching and Learning Committee, and
- CEVSOC.

Refer to Academic Advice on the School website available at:

https://www.engineering.unsw.edu.au/civil-engineering/student-resources/policies-procedures-and-forms/academic-advice

ASSESSMENT OVERVIEW

Item	Length	Weighting	Learning outcomes assessed	Assessment Criteria	Due date and submission requirements	Deadline for absolute fail	Marks returned
1. Online Quizzes							
Quiz 1	30 mins each	5 % each	LO1, LO2, LO4	The quizzes will test the students' ability to synthesise course material.	Before 12h00, 24/02/2020	14h00, 24/02/2020	Immediately after completion of quiz
Quiz 2					Before 12h00, 02/03/2020	14h00, 02/03/2020	
Quiz 3					Before 12h00, 16/03/2020	14h00, 16/03/2020	
Quiz 4					Before 12h00, 16/03/2020	14h00, 16/03/2020	
2. Assignment 1							
Report	3000 words maximum (not including references or appendices)	40%	LO2, LO3, LO4	Students will be expected to demonstrate the independent ability to correctly apply concepts presented in the course and to provide an analysis of possible uncertainties/errors in water sampling techniques and analyses.	12h00, 20/04/2020, submitted electronically via UNSW Moodle (by TurnItIn)	12h00, 27/04/2020	01/05/2020
3. Final Exam							
Exam	2 hours	40%	LO1, LO2, LO4	The exam will test the students' ability to synthesise course material.	Final exam period	Date of exam	Official release of results

Appendix A: Engineers Australia (EA) Competencies

Stage 1 Competencies for Professional Engineers

	Program Intended Learning Outcomes
PE1: Knowledge and Skill Base	PE1.1 Comprehensive, theory-based understanding of underpinning fundamentals
	PE1.2 Conceptual understanding of underpinning maths, analysis, statistics, computing
	PE1.3 In-depth understanding of specialist bodies of knowledge
	PE1.4 Discernment of knowledge development and research directions
	PE1.5 Knowledge of engineering design practice
	PE1.6 Understanding of scope, principles, norms, accountabilities of sustainable engineering practice
PE2: Engineering Application Ability	PE2.1 Application of established engineering methods to complex problem solving
	PE2.2 Fluent application of engineering techniques, tools and resources
	PE2.3 Application of systematic engineering synthesis and design processes
	PE2.4 Application of systematic approaches to the conduct and management of engineering projects
PE3: Professional and Personal Attributes	PE3.1 Ethical conduct and professional accountability
	PE3.2 Effective oral and written communication (professional and lay domains)
	PE3.3 Creative, innovative and pro-active demeanour
	PE3.4 Professional use and management of information
	PE3.5 Orderly management of self, and professional conduct
	PE3.6 Effective team membership and team leadership