



CVEN9855

Water and Wastewater Analysis and Quality
Requirements

Term One // 2021

Course Overview

Staff Contact Details

Convenors

Name	Email	Availability	Location	Phone
Richard Collins	richard.collins@unsw.edu.au	email to make appointment		

Lecturers

Name	Email	Availability	Location	Phone
Richard Stuetz	r.stuetz@unsw.edu.au	email to make appointment		

School Contact Information

[Engineering Student Support Services](#) – The Nucleus - enrolment, progression checks, clash requests, course issues or program-related queries

[Engineering Industrial Training](#) – Industrial training questions

[UNSW Study Abroad](#) – study abroad student enquiries (for inbound students)

[UNSW Exchange](#) – student exchange enquiries (for inbound students)

[UNSW Future Students](#) – potential student enquiries e.g. admissions, fees, programs, credit transfer

Phone

(+61 2) 9385 8500 – Nucleus Student Hub

(+61 2) 9385 7661 – Engineering Industrial Training

(+61 2) 9385 3179 – UNSW Study Abroad and UNSW Exchange (for inbound students)

Course Details

Credit Points 6

Summary of the Course

This course focuses on common field, laboratory, theoretical and statistical methods used to measure 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.

Course Aims

The objective of the course is to provide students with a fundamental understanding of Australian water quality standards and guidelines. The course is intended to equip students with essential 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.

Course Learning Outcomes

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

Learning Outcome	EA Stage 1 Competencies
1. The ability to describe the rationale for water quality monitoring and guidelines	PE1.1, PE1.3
2. Demonstrate essential knowledge on sampling, instrumentation and methodology used to assess water quality	PE1.1, PE1.2, PE1.3, PE1.4
3. The ability to undertake independent study of relevant literature through on-line resources	PE1.2, PE2.2, PE2.3, PE3.1, PE3.2, PE3.5
4. 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

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

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

Teaching Strategies

Lectures and Workshops	<ul style="list-style-type: none"> • 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
Field Work	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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
Private Study	<ul style="list-style-type: none"> • 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
Assessments	<ul style="list-style-type: none"> • Enhance your knowledge by undertaking necessary research to complete these tasks • Demonstrate your knowledge and skills • Demonstrate higher understanding and problem solving • Always use appropriate references for sourced materials

Additional Course Information

As there are no pre-requisites for this course, no background knowledge is assumed of the course content. For each hour of contact it is expected that you will be required to undertake at least an equivalent amount of time of private study.

Assessment

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. 20/50) 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 will be permitted to view the marked script.

Quizzes not completed before the due date and time will be assigned 0 marks. Late submission of the assignment will receive a 10% penalty (i.e. 3.5 of 35 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>.

Assessment Tasks

Assessment task	Weight	Due Date	Student Learning Outcomes Assessed
Quizzes	15%	25/02/2021, 04/03/2021, 11/03/2021, 18/03/2021	1, 2
Water Quality Report	35%	22/04/2021 12:00 PM	1, 2, 3, 4
Final Exam	50%	Not Applicable	2

Assessment Details

Assessment 1: Quizzes

Start date: 18/02/2021, 25/02/2021, 04/03/2021, 11/03/2021,

Length: 30 minutes each

Details:

These 4 online quizzes (15% of overall course mark) will assess students understanding of fundamental information covered in the course from weeks 1 to 5. The first two are aimed at preparing you for the field and laboratory classes and you must obtain 100% for these quizzes to attend these classes.

Additional details:

The quizzes will be open for one or two weeks and will be completed during weeks 1 to 5.

Turnitin setting: This is not a Turnitin assignment

Assessment 2: Water Quality Report

Start date: 22/03/2021 12:00 PM

Length: 5000 words

Details:

Assignment 1, the Water Quality Report (35% 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.

Turnitin setting: This assignment is submitted through Turnitin and students can see Turnitin similarity reports.

Assessment 3: Final Exam

Start date: Not Applicable

Length: 2 hours

Details:

The exam (50% of overall course mark) will be a 2-hour closed book on-line assessment 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. All material presented will potentially be examinable in the exam, unless otherwise noted.

Turnitin setting: This assignment is submitted through Turnitin and students do not see Turnitin similarity reports.

Attendance Requirements

Students are strongly encouraged to attend all classes and review lecture recordings.

Course Schedule

[View class timetable](#)

Timetable

Date	Type	Content
O Week: 8 February - 12 February		
Week 1: 15 February - 19 February	Lecture	Course introduction; rationale for water quality monitoring; national water quality guidelines.
	Workshop	Water sampling protocols and field trip preparation
	Assessment	Field trip quiz (2.5%)
Week 2: 22 February - 26 February	Fieldwork	Water sampling and analyses at Centennial Parklands
	Assessment	Laboratory Quiz (2.5%)
Week 3: 1 March - 5 March	Tut-Lab	Laboratory Class I
	Assessment	Water Quality Guidelines Quiz (5%)
Week 4: 8 March - 12 March	Tut-Lab	Laboratory Class II
	Assessment	Virtual Laboratory Quiz (5%)
Week 5: 15 March - 19 March	Lecture	Instrumentation for water quality analyses
	Workshop	Instrumentation for water quality analyses
Week 6: 22 March - 26 March		
Week 7: 29 March - 2 April	Lecture	Analysing water quality data (statistics)
	Workshop	Analysing water quality data (statistics)
	Presentation	Guest presentation by Dr Peter Tate on advanced statistics
Week 8: 5 April - 9 April	Lecture	Online (continuous monitoring) analytical techniques
	Workshop	Online (continuous monitoring) analytical techniques
Week 9: 12 April - 16 April	Lecture	Odour analyses
	Workshop	Odour analyses
Week 10: 19 April - 23 April	Lecture	Microbiology and microbiological analyses
	Workshop	Microbiology and microbiological analyses
	Assessment	Assignment 1 (35%) due by 12h00 on 22/04/2021

Resources

Prescribed Resources

Relevant reading, databases and internet sites will be provided on UNSW Moodle during the course. While there are no specific textbooks required for this course, a thorough compendium of methods used to analyse water and wastewater can be found in the following book available in the UNSW library.

APHA, AWWA, WEF (2017) Standard methods for the examination of water and wastewater, 23rd edition. American Public Health Association, Washington, D.C., USA.

Recommended Resources

Course Evaluation and Development

This course has evolved in response to both formal (i.e. MyExperience) and informal student feedback (during classes) and in response to fluctuating student enrolments. As an example, informal student feedback resulted in the recent re-introduction of hands-on activities to the course involving water sampling and laboratory analyses. This also necessitated creating digital content for these hands-on activities so as not to disadvantage distance students that cannot attend them in person.

Students are encouraged to use these formal and informal avenues of providing feedback on the course to improve the student learning experience.

Laboratory Workshop Information

Refer to Moodle for all field, laboratory, lecture and workshop information.

Submission of Assessment Tasks

Please refer to the Moodle page of the course for further guidance on assessment submission.

Academic Honesty and Plagiarism

Beware! An assignment that includes plagiarised material 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 Information

[Key UNSW Dates](#) - eg. Census Date, exam dates, last day to drop a course without academic/financial liability etc.

Final Examinations:

Final exams in Term 1 will be held online between 30th April - 13th May inclusive. You are required to be available on these dates. Please do not to make any personal or travel arrangements during this period.

Supplementary Examinations:

Supplementary Examinations for Term 1 2021 will be held on 24th - 28th May inclusive should you be required to sit one. You are required to be available on these dates. Please do not to make any personal or travel arrangements during this period.

ACADEMIC ADVICE

For information about:

- Notes on assessments and plagiarism;
- Special Considerations: student.unsw.edu.au/special-consideration;
- General and Program-specific questions: [The Nucleus: Student Hub](#)
- Year Managers and Grievance Officer of Teaching and Learning Committee, and
- CEVSOC/SURVSOC/CEPCA

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>

Image Credit

Synergies in Sound 2016

CRICOS

CRICOS Provider Code: 00098G

Acknowledgement of Country

We acknowledge the Bedegal people who are the traditional custodians of the lands on which UNSW Kensington campus is located.

Appendix: Engineers Australia (EA) Professional Engineer Competency Standard

Program Intended Learning Outcomes	
Knowledge and skill base	
PE1.1 Comprehensive, theory based understanding of the underpinning natural and physical sciences and the engineering fundamentals applicable to the engineering discipline	✓
PE1.2 Conceptual understanding of the mathematics, numerical analysis, statistics, and computer and information sciences which underpin the engineering discipline	✓
PE1.3 In-depth understanding of specialist bodies of knowledge within the engineering discipline	✓
PE1.4 Discernment of knowledge development and research directions within the engineering discipline	✓
PE1.5 Knowledge of engineering design practice and contextual factors impacting the engineering discipline	
PE1.6 Understanding of the scope, principles, norms, accountabilities and bounds of sustainable engineering practice in the specific discipline	
Engineering application ability	
PE2.1 Application of established engineering methods to complex engineering 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	
Professional and personal attributes	
PE3.1 Ethical conduct and professional accountability	✓
PE3.2 Effective oral and written communication in 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	