

COURSE DETAILS

Units of Credit

6

Contact hours

5 hours per week

Class

Monday 03:00 pm – 05:00 pm CivEng G1 (wks 1-9, 11-13)
Thursday 10:00 am – 11:00 am CLB 02 (wks 1-9, 10-12)

Workshop

Thursday 11:00 am – 01:00 pm CivEng G08 and Quad G047 (wks 2-9, 10-13)

**Course Coordinator
and Lecturer**

Prof. T. David Waite
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Lecturer

Dr. A. Ninh Pham
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INFORMATION ABOUT THE COURSE

This course will provide an introduction to water chemistry as a foundation for understanding chemical processes in both natural and engineered systems. It will build on the basic chemical concepts taught in CHEM1011/1031 and will develop additional concepts required to describe the chemical processes occurring in rivers, lakes, groundwater, marine and atmospheric environments.

HANDBOOK DESCRIPTION

See link to virtual handbook: www.handbook.unsw.edu.au/undergraduate/courses/2016/CVEN2701.html

OBJECTIVES

To provide students with fundamental concepts of water chemistry that may be encountered by environmental engineers.

To provide a basis for more advanced courses in later years in water quality, water and wastewater treatment, contaminant fate and transformation and waste management.

TEACHING STRATEGIES

Private Study	<ul style="list-style-type: none">• Review lecture materials and textbooks• Do set problems and assignments• Join Moodle discussions• Reflect on class problems and assignments• Download materials from Moodle• Keep up with notices and find out marks via Moodle
Lectures	<ul style="list-style-type: none">• Find out what you must learn• See methods that are not in the textbooks• Follow worked examples• Hear announcements on course changes
Workshops	<ul style="list-style-type: none">• Be guided by demonstrators• Practice solving set problems• Ask questions
Assessments (quizzes, exams, assignments, etc.)	<ul style="list-style-type: none">• Demonstrate your knowledge and skills• Demonstrate higher understanding and problem solving

EXPECTED LEARNING OUTCOMES

During the course you will be expected to understand the basic concepts in water and atmospheric chemistry including: chemical equilibrium, pH, acid and base reactions, buffering, alkalinity, complexation reactions, redox reactions and gas/solid-liquid exchanges and air pollutants.

For each hour of contact it is expected that a student will put in at least 1 hour of private study.

ASSESSMENT

The final grade for this course will normally be based on the sum of the scores from each of the assessment tasks. The Final Examination is worth 40% of the Final Mark and the class work is worth 60% of the Final Mark. A mark of at least 40% in the final examination is required before the class work is included in the final mark. The formal exam scripts will not be returned. Students who perform poorly in the workshops, quizzes and assignments are strongly recommended to discuss their progress with the lecturers during the semester.

Note: The Coordinator reserves the right to adjust the final scores by scaling if agreed by the Head of School.

Details of each assessment component, the marks assigned to it and the dates of submission are set out below.

Assignments:

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| 1. Assignment 1: Kinetics, log C-pH diagram, alkalinity, solid dissolution and precipitation (20%) | Issued in wk2:
Mon, 01 Aug | Due in wk8:
Fri, 16 Sep |
| 2. Assignment 2: Complexation, redox reactions and reactions on solid surfaces (20%) | Issued in wk8:
Mon, 12 Sep | Due on:
Fri, 04 Nov |

Late work will be penalised at the rate of 10% per day after the due time and date have expired.

Quizzes

- | | | |
|----|--------------|-----------------------------|
| 1. | Quiz 1 (10%) | Week 07 (in workshop class) |
| 2. | Quiz 2 (10%) | Week 13 (in workshop class) |

COURSE PROGRAM

SESSION 2 2016 (25 Jul – 22 Nov)

Week	Date	Topic	Lecturer
1	25/07 (Lect) 28/07 (Lect/Workshop)	Introduction of water chemistry: Conservation principles and thermodynamics	Waite/Pham
2	01/08 (Lect) 04/08 (Lect/Workshop)	Tools for solving problems in water chemistry	Waite/Pham
3	08/08 (Lect) 11/08 (Lect/Workshop)	Kinetics	Waite/Pham
4	15/08 (Lect) 18/08 (Lect/Workshop)	pH and alkalinity : Acids and bases in natural waters	Waite/Pham
5	22/08 (Lect) 25/08 (Lect/Workshop)	Log C-pH diagram and solution of equilibrium problems	Waite/Pham
6	29/08 (Lect) 01/09 (Lect/Workshop)	Effects of biological processes on pH and alkalinity	Waite/Pham
7	05/09 (Lect) 08/09 (Lect/Workshop)	Solid dissolution and precipitation	Waite/Pham
8	12/09 (Lect) 15/09 (Lect/Workshop)	Inorganic complexation	Waite/Pham
9	19/09 (Lect) 22/09 (Lect/Workshop)	Organic complexation	Waite/Pham
<i>Mid-semester break (24/09 - 02/10)</i>			
10	03/10 06/10 (Lect/Workshop)	<i>NO class - Public holiday (Labour Day)</i> Redox chemistry part 1: Introductory concepts	Waite/Pham
11	10/10 (Lect) 13/10 (Lect/Workshop)	Redox chemistry part 2: pe – pH diagram	Waite/Pham
12	17/10 (Lect) 20/10 (Lect/Workshop)	Reactions on solid surfaces	Waite/Pham
13	24/10 (Lect) 27/10 (Workshop)	Reactions on solid surfaces	Waite/Pham

RELEVANT RESOURCES

Prescribed text: Morel, F.M.M. and Hering, J.G. (1993) Principles and Applications of Aquatic Chemistry, Wiley Interscience, New York

DATES TO NOTE

Refer to MyUNSW for Important Dates available at:

<https://my.unsw.edu.au/student/resources/KeyDates.html>

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:

<http://www.lc.unsw.edu.au/onlib/plag.html>

ACADEMIC ADVICE

(Formerly known as Common School Information)

For information about:

- Notes on assessments and plagiarism,
- School policy on Supplementary exams,
- Special Considerations,
- Solutions to Problems,
- Year Managers and Grievance Officer of Teaching and Learning Committee, and
- CEVSOC.

Refer to Common School Information on the School website available at:

http://www.civeng.unsw.edu.au/currentstudents/general/profiles/common_ug.html