COURSE DETAILS

Units of Credit: 6
Contact Hours: 4 hours per week
Class/Workshop: Tuesday 09:00am – 12:00pm CLB2 (combined with CVEN9857, Wks 5-10)
               Wednesday 10:00am – 14:00pm Biomedical Theatre B, Wks 1-4 and 11-12 (combined with CVEN9856)

Course Coordinator and Lecturer: Prof David Waite
Email: d.waite@unsw.edu.au
Office: Room 616, Civil Engineering Bldg (H20)
Phone: 9385-5060
Consultation by appointment

Lecturers: Dr Eric Sivret, UNSW Water Research Centre
Email: e.sivret@unsw.edu.au
Dr A. Ninh Pham, UNSW Water Research Centre
Email: anninh.pham@unsw.edu.au

INFORMATION ABOUT THE COURSE

This course builds on material covered in CVEN3502 (Water and Wastewater Engineering) and compliments the 4th year elective CVEN4703 (Advanced Water Quality Principles).

HANDBOOK DESCRIPTION

Integrated design of facilities for the treatment of various types of water and wastewater to meet specified water quality requirements with emphasis on municipal water and wastewater treatment is introduced. Both process considerations and design aspects are covered in this course. Physicochemical aspects of water and wastewater treatment are considered as are biological aspects of wastewater treatment. Consideration is given to alternative methods of water supply and wastewater treatment.

See link to virtual handbook -

OBJECTIVES

To provide a sound understanding of the concepts relevant to both water and wastewater treatment and water quality in process systems.

TEACHING STRATEGIES

<table>
<thead>
<tr>
<th>Private Study</th>
<th>Lectures</th>
<th>Workshops</th>
<th>Assessments (quizzes, exams, assignments, hand-in workshops, laboratory reports, etc.)</th>
</tr>
</thead>
</table>
| • Review lecture materials and textbooks  
• Do set problems and assignments  
• Join UNSW Moodle discussions  
• Reflect on class problems and assignments  
• Download materials from UNSW Moodle  
• Keep up with notices and find out marks via UNSW Moodle | • Find out what you must learn  
• Summarize essential course material from lectures and associated reading  
• Hear announcements on course changes | • Be guided by workshop questions  
• Practice solving set problems  
• Ask questions | • Demonstrate your knowledge and skills  
• Demonstrate higher understanding and problem solving  
• Do not copy from textbooks, always use appropriate references for sourced material |

EXPECTED LEARNING OUTCOMES

During the course you will be expected to understand the concepts relevant to the design of water and wastewater treatment plants and how guidelines are used to determine the expected water and wastewater quality from these process systems.

To aid with the formal lecture contact time you will be expected to read additional material from lectures and be given appropriate chapter references in additional textbook references for further background knowledge. Workshop problems will provide problem solving for individual sections and group assignments will put into practice your overall understanding of process flowsheeting for designing water and/or wastewater treatment systems.

For each hour of contact it is expected that a student will put in at least 1.5 hours 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 50% of the final mark and the class work is worth 50% 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.
formal exam scripts will not be returned. Students who perform poorly in the assignment(s) are strongly recommended to discuss progress with the lecturers during the semester.

**Note:** The Coordinator or Lecturers reserve 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**

1. **Assignment 1:** Wastewater Treatment (25%)  
   Due on: Wed, 16 Sep (wk 8)

2. **Assignment 2:** Design of a Conventional Water Treatment Plant (25%)  
   Due on: Fri, 31 Oct (wk 13)

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

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### COURSE PROGRAM

#### SEMESTER 2 2014  
(28 July – 25 November)

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topic</th>
<th>Time</th>
<th>Lecturer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>30/07</td>
<td>Introduction to Water Quality and Treatment</td>
<td>10:00 – 14:00</td>
<td>Waite/Pham</td>
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<tr>
<td></td>
<td></td>
<td>Australian Drinking Water Guidelines</td>
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<tr>
<td></td>
<td></td>
<td>Intakes and Screens</td>
<td></td>
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<tr>
<td>2</td>
<td>06/08</td>
<td>Coagulation</td>
<td>10:00 – 14:00</td>
<td>Waite/Pham</td>
</tr>
<tr>
<td>3</td>
<td>13/08</td>
<td>Flocculation</td>
<td>10:00 – 14:00</td>
<td>Waite/Pham</td>
</tr>
<tr>
<td>4</td>
<td>20/08</td>
<td>Clarification</td>
<td>10:00 – 14:00</td>
<td>Waite/Pham</td>
</tr>
<tr>
<td>5</td>
<td>26/08</td>
<td>Activated Sludge Design</td>
<td>09:00 – 12:00</td>
<td>Sivret</td>
</tr>
<tr>
<td>6</td>
<td>02/09</td>
<td>Biological Nutrient Removal</td>
<td>09:00 – 12:00</td>
<td>Sivret</td>
</tr>
<tr>
<td>7</td>
<td>09/09</td>
<td>Membrane Bioreactors</td>
<td>09:00 – 12:00</td>
<td>Sivret</td>
</tr>
<tr>
<td>8</td>
<td>16/09</td>
<td>Activated Sludge Modelling</td>
<td>09:00 – 12:00</td>
<td>Sivret</td>
</tr>
<tr>
<td>9</td>
<td>23/09</td>
<td>Field Trip</td>
<td>All day</td>
<td>Sivret/Pham</td>
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**Semester Break (27 Sep – 06 Oct)**

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topic</th>
<th>Time</th>
<th>Lecturer</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>07/10</td>
<td>Biofilm Systems</td>
<td>09:00 – 12:00</td>
<td>Sivret</td>
</tr>
<tr>
<td>11</td>
<td>15/10</td>
<td>Filtration</td>
<td>10:00 – 14:00</td>
<td>Waite/Pham</td>
</tr>
<tr>
<td>12</td>
<td>22/10</td>
<td>Disinfection</td>
<td>10:00 – 14:00</td>
<td>Waite/Pham</td>
</tr>
<tr>
<td>13</td>
<td>29/10</td>
<td>Guest Lecture (to be confirmed)</td>
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### RELEVANT RESOURCES

- No textbook recommended but material will be drawn from a variety of texts (see additional readings) and lecture handouts.
- Additional material will be provided on UNSW - Moodle

**Additional Reading:**

- Water Quality Engineering: Physical/Chemical Treatment Processes, Benjamin & Lawler, Wiley 2013
DATES TO NOTE

Refer to MyUNSW for Important Dates available at:

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

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

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/info-about/our-school/policies-procedures-guidelines/academic-advice