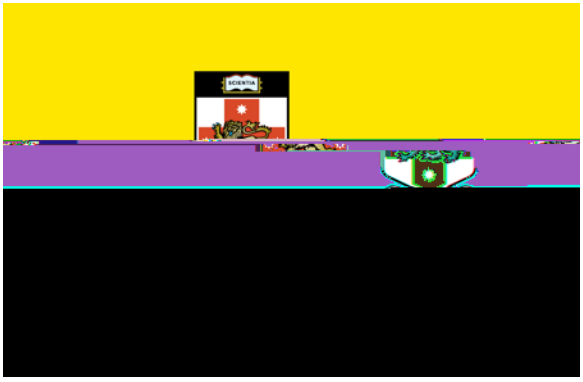

S C a E a E
T l, 2020

# ENGG2500 FLUID MECHANICS FOR ENGINEERS

| COURSE DETAILS | |
|---|---|
| **Units of Credit** | 6 |
| **Contact hours** | 6 |

## Course Communications

- Enable you to make estimates of boundary layer thickness and velocities over flat plates, and to estimate the forces on 2D and 3D bodies in submerged flows.
- Enable you to quantify pipe friction losses and to introduce you to some of the associated real-life problems of pipe flow calculations.

## TEACHING STRATEGIES

Teaching in this course is centred on the Lectures which are technical in content. You will develop your analytical skills in hydraulics and fluid flows by applying the theory to problems which you undertake in the Workshops. The material in the Lectures is also reinforced and applied in the Laboratory work where you will also gain an appreciation of the idealisations made in applying the theory to various flow scenarios.

Purchase of the textbook is advised, as it contains the technical reference material for this course. The lectures and lecture notes are provided to highlight and summarise the key technical content of the textbook. Detailed lecture notes will be supplied in this course. The purpose is to free up your time to think and comprehend during the lectures.

A site visit to the UNSW Water Research Laboratory and the Manly Hydraulics Laboratory, both at Manly Vale, will provide you with insight into the contemporary use of physical models and dimensionless numbers for solving real and current engineering problems.

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| **Private Study** | x Review lecture material and reference books.<br>x Identify questions which you need answered in the lectures or the Moodle Forum.<br>x Reflect and work on the set workshop problems at the end of each lecture.<br>x Reflect on and complete any assessments issued.<br>x Reflect on class problems.<br>x Check your email regularly.<br>x Join Moodle discussions of problems<br>x Download materials from Moodle<br>x Keep up with notices and find out marks via Moodle<br>x Practice example questions on the Moodle course page. |
| **Lectures** | x A complete set of Lecture notes will be made available to you through the UNSW Bookshop and Moodle.<br>x PDF documents of the Lecture slides will be made available on Moodle<br>x Complete the solutions to any questions appearing in the question boxes in the lecture notes.<br>x Consider and actively answer any questions posed during the course of the lecture and in the lecture notes – if not aloud, then in your head.<br>x Find out what you must learn.<br>x Follow worked examples or clarifications made during classes.<br>x Be alert to any course announcements. |
| **Workshops** | x Much of your learning will take place during the workshops. If you work actively in this time, it will free you up for other activities outside of class.<br>x Start solving the problems provided during the lectures.<br>x Be guided by demonstrators.<br>x Make sure you understand the solution strategies of any Worked Problems completed by your demonstrators.<br>x Use your time to ask your demonstrators about any unresolved workshop problems – even if your question relates to matters from previous weeks. Ask questions. |

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| | active learning during the lab experience.<br>x Use your time in the laboratory well so that you have an appreciation of (i) how real fluids flow, (ii) how to make fluid measurements, (iii) how the results of any measurements will inevitably differ from the theory and (iv) the reasons why the measured results differ from the theoretical values.<br>x Hands-on work to set studies into context. |
| **UNSW Moodle course page** | x Solutions to the Workshop Problems will be made accessible to you on UNSW Moodle 2 days after the workshop.<br>x From time to time, other information which will assist you in this course will be made available to you in UNSW Moodle. This will include: lecture notes, some past exams and details of the final exam conditions, including the data section at the front of the exam paper.<br>x The Moodle Discussion Forum will be the place of discussion regarding the course including any questions you may have, course announcements and other aspects of communication.<br>x A question data bank is available on Moodle allowing you to practice example questions as often as you like while receiving feedback on your answers.<br>x Lab class Moodle lessons with instruction videos and pre- and post-assessment tasks will support your practical lab experiences |
| **Email** | x From time to time, messages will be sent to you concerning this course via the Moodle discussion forum.<br>x Please note: it is a University requirement that you **check your UNSW emails regularly**. We recommend that they be checked **daily**. You will need to continually clear your emails to ensure that your email allocation is not exceeded – otherwise you will not be receiving emails that we send out to you. |

Due to the time allocated to each lab class, we require you to arrive punctual to the lab class you enrolled in. We strongly recommend that you arrive 5 minutes before the scheduled time to make yourself known to your other group members. The following penalties will be applied for late arrival to your scheduled lab class:

- If you arrive between 1 and 5 minutes late, you will receive a penalty of 1.5 marks for the respective lab;
- if you arrive between 5 to 10 minutes late, you will receive a penalty of 3 marks for the respective lab;
- if you arrive between 10 to 15 minutes late, you will receive a penalty of 5 marks for the respective lab;
- if you arrive more than 15 minutes late, you will not be allowed to participate in the lab class and will receive zero marks for the lab (including pre- and post-assessments).

Exemption from Laboratory Work: Please note that no exemption from the laboratory work will be granted.

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hours and that you can exceed this time. We will however check the completion time and will apply late completion penalties if you have exceeded the 48-hour window.

Once you have started your post-lab assessment, you have 6 hours for completion. You have 1 attempt only. Within the available timeframe, you can review and change your answers prior to submission.

It is important that you submit your MapleTA assessment from the final page to prevent erroneous assessment of your work.

the course theory. You will need a calculator.

Your answers to the Quiz questions will be assessed automatically against the correct answer within Moodle. Feedback will be provided at the end of the Quiz, after 9 pm on Friday of the respective week,

**ASSESSMENT OVERVIEW**

The Final Mark for this course will **normally** be based on the sum of the scores from each of the assessment tasks as follows.

| **Item** | **Length** | **Weighting** | **Learning outcomes assessed** | **Assessment Criteria** (this needs to explicitly describe what students are expected to demonstrate in the task) | **Due date and submission requirements** | **Deadline for absolute fail** | **Marks returned** |
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| 3. Final Exam | 2 hrs | 60% | 1,2,3,4,5, 6 | Students are expected to demonstrate their understanding of basic fluid mechanics concepts. Furthermore, students will demonstrate ability to perform basic calculations of fluid mechanics problems applying the fluid mechanics concepts from the course lectures and workshops. | During UNSW Session 1 examinations period. | N/A | During formal notification of final results as determined by UNSW Faculty of Engineering. |

## RELEVANT RESOURCES

**Lecture notes**

The Lecture Notes for the term are available from the University Bookshop. Full versions of the notes will be made available on the Moodle page of the course together with the lecture recording, lecture slides, etc.

**Textbook**

Cengel, Y. A. and Cimbala, J. M., Fluid Mechanics Fundamentals & Applications 4e, McGraw-Hill, 2017, 4th edition, SI version, ISBN-13: 978-1259696534 [UNSW Library – 5 copies]

**Other fluid mechanics references**

- Street, R.L., Watters, G. Z. and Vennard, J.K., Elementary Fluid Mechanics, John Wiley and Sons, New York, 1996, 7th edition, ISBN 0 471 01310 3. [UNSW Library, Level 6, P532/19 – 5 copies]
- Finnemore, E.J. and Franzini, J.B. (2002) Fluid Mechanics with Engineering Applications, McGraw-Hill, 2002, 10th Edition, ISBN 0 07 112196 X. [UNSW Library, Level 6, 532/28 - 5 copies]
- Munson, B.R., Young, D.F. and Okiishi, T.H., Fundamentals of Fluid Mechanics, John Wiley and Sons, New York, 2009, 6th edition, ISBN 978 0 470 26284 9. [UNSW Library, Level 8, 620.106/78 – 2 copies]
- White, F. M. (2015) Fluid Mechanics. 8th Edition, McGraw-Hill, ISBN ISBN:9781760420635 [University Bookshop; UNSW Library, Level 8, 620.106/77 – 5 copies]

**Additional materials**

Additional materials will be provided on Moodle including additional short videos and practice questions with embedded feedback.

## 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.

**Appendix A: Engineers Australia (EA) Competencies**

Stage 1 Competencies for Professional Engineers

| | **Program Intended Learning Outcomes** |
|---|---|
| **Knowledge 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 |
| | [redacted] |
| | 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 et |