SCHOOL OF CIVIL AND ENVIRONMENTAL ENGINEERING

THE UNIVERSITY OF NEW SOUTH WALES

Semester 1 2012

CVEN 2501 **Principles of Water Engineering**

COURSE DETAILS

Units of Credit	6
Contact hours	5 hours per week + laboratory session

Lectures	Monday	11:00 - 13:00	**Mathews Theatre A**	
	Wednesday	12:00 – 13:00	**Central Lecture Block 7**	
Tutorials	Wednesday	13:00 – 15:00	**Quad G053**	(*surnames* A – Chua),
			MatSc G10	(*surnames* Chun - Gim),
			Mat 130	(*surnames* Gior - Kam),
			RedC M010	(*surnames* Kap – Liao),
			Gold G04	(*surnames* Lim - On),
			Gold G06	(*surnames* Pan - Singh),
			JGoods LG21	(*surnames* Song – Wat),
			Mat 107	(*surnames* Web - Zzz),
			OMB 151	(to be announced)
Laboratories	Wednesday	09:00 – 10:30	**Valentine Annex**	
	Wednesday	10:30 – 12:00	**Your lab group and scheduled week/time to attend the**	
	Wednesday	15:00 – 16:30	**laboratory will be arranged during Week 1**	
	Wednesday	16:30 – 18:00		

Primary Course Contact Dr. Xavier Barthelemy
x.barthelemy@unsw.edu.au
Room CE414
ph. 807 19852 (Water Research Laboratory, King St., Manly Vale)

Lecturer Assoc. Prof. Bill Peirson
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Weeks 1-6 Room CE414 Civil and Environmental Engineering Building, Kensington
ph. 0416 150 223
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Course Coordinator Dr. Chris Blenkinsopp

and Lecturer **c.blenkinsopp @unsw.edu.au**

Weeks 7-12 Room CE411 Civil and Environmental Engineering Building, Kensington

ph. 807 19861 (Water Research Laboratory, King St., Manly Vale)

Course Communications

All communications regarding this course, except emergencies or issues of a particularly sensitive nature should be directed through the primary course contact, Xavier Barthelemy (**x.barthelemy@unsw.edu.au**) after first consulting the course profile.

Distribution of Lecture Notes

The complete set of Lecture Notes for the semester are available from the University Bookshop.

The full versions of the notes will be made available on UNSW Blackboard.

Week 1 Monday Lecture starts at 11am on 27 February 2012 in Mathews Theatre A.

There is no Tutorial in Week 1. Week 1 activities, other than lectures are administrative and should be completed by 5pm Friday 2 March 2012:

- forming ***laboratory groups*** of four members. You may self-select your laboratory groups (bearing in mind your individual timetables), otherwise you will be allocated to (i) a group, (ii) a week and (iii) a time slot for completing the laboratory work. Once you have your particular laboratory group finalised, you will need to ***e-mail*** the details of your group (names, student IDs, preferred time slots and week numbers for undertaking the lab work) to **x.barthelemy@unsw.edu.au** and copied to each of your group members. Dr. Barthelemy will respond to all group members confirming the date and time of the scheduled laboratory session by Monday 5 March 2012. If group members are unable to attend specific time slots due to other scheduled classes, you must include the students involved and the course numbers (CVENxxxx or GENExxxx etc) causing the clash in your initial email to Dr Barthelemy.
- Group time slots and weeks will be allocated on a first come-first served basis

  As far as practicable, any groups with less than 4 members will be made up to 4 members before their labs commence.

  The final schedule will be broadcast to the class by email and available on BLACKBOARD.
- Note that there is a laboratory preparation assignment which is due on arrival for your laboratory session.

Week 2 Tutorials commence on Wednesday 13:00 – 15:00 (7 March 2012).

INFORMATION ABOUT THE COURSE

Principles of Water Engineering is perhaps the pivotal fluids course that you will take in your undergraduate programme since it covers the fundamentals that you will need for an understanding of fluid dynamics and hydraulics which are applied in several courses in the later years of your programme.

The main course taken ***before*** Principles of Water Engineering (CVEN2501) which supports its content is:

- ***Engineering Mechanics (CVEN1300):*** the fundamental principles of hydrostatics are introduced and provide the foundation for understanding hydrostatic pressure, the buoyancy force and stability of floating bodies. In Principles of Water Engineering, these concepts are further developed when you learn to quantify the hydrostatic forces on plane surfaces, curved surfaces and bodies, and the principle upon which manometry is based and is used to measure fluid flows.

Courses to be taken ***after*** Principles of Water Engineering (CVEN2501) which are supported by its content are:

- ***Water and Wastewater Engineering* (CVEN3502) in Semester 2:** *(civil and environmental engineering programmes):* the design and operation of (i) water treatment plants, (ii) wastewater treatment plants, (iii) stormwater systems, (iv) water distribution systems and (v) sewage distribution systems require knowledge of free surface computations, head losses due to friction in pipes, local head losses due to pipe fittings and shear stresses at flow boundaries which maintain pipes and channels which are scoured clean.
- ***Solid Wastes and Contaminant Transport* (CVEN3702) in Semester 2:** *(environmental engineering programme):* quantifying the rate of pollutant transport, diffusion and dispersion in pipes, streams, rivers and estuaries requires knowledge of flow regimes (laminar and turbulent) and the velocity profiles in boundary layers.

HANDBOOK DESCRIPTION

- Refer to Online Handbook available at:
  http://www.handbook.unsw.edu.au/undergraduate/courses/2012/CVEN2501.html

OBJECTIVES

The objectives of this course are to:

- *Introduce* you to the practice of water engineering.
- *Introduce* you to the theory of two quite different steady flows: closed conduit or pipe flow (i.e. pressurised flow) and briefly, to free surface flow (i.e. flows where the water surface is subject to atmospheric pressure).
- *Give you an understanding* of the properties of fluids, manometry, hydrostatics, the principles of mass and energy conservation, the forces and momentum in flowing fluids, flow in pipes, laminar and turbulent flow.
- *Enable you to apply* the fundamental principles of mass conservation, energy conservation and the momentum equation to the analysis of flows in different scenarios.
- *Enable you to carry out* a dimensional analysis (as a forerunner to an experimental investigation) and carry out the scaling for a physical model.
- *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 through a guest lecturer.

HOW DO ASSESSMENT STRATEGIES ASSIST IN ACHIEVING THESE OBJECTIVES, AND HOW DO THESE OBJECTIVES CONTRIBUTE TO ACHIEVEMENT OF PROGRAMME OUTCOME ATTRIBUTES

Under normal circumstances, the final exam (value 50%), two hand-ins (value 10% + 10%) in Weeks 5 and 8, one assignment due in Week 10 (value 10%) make up 80% of the assessment for this course. The remaining 20% is made up of Laboratory work (Preparation: individual with value 5% and 2 experimental group reports: value 7.5%+7.5%). (See section on Assessment for more details.)

Generally, the final exam, the two hand-ins, the assignment and the Laboratory work will be assessed against the following general criteria to encourage the achievement of the objectives:

- Understanding of the principles of fluid flow viz mass, energy and momentum principles.
- Ability to analyse and then apply the mass, energy and momentum principles to different fluid flow scenarios.
- Ability to take measurements in the Laboratory and process the results using relevant principles of fluid flow (Laboratory work only)

- Ability to make idealisations, based on Laboratory experimental setup in applying theory (Laboratory work only)
- Evidence of understanding of the principles of physical modelling (Site visit only).
- Ability to sketch total head lines and assess pipe condition using head loss calculations.

The course objectives, content and assessment focuses on encouraging the following attributes in you, with particular application to the hydraulics of pipe and open channel flows:

- *The capacity for analytical and critical thinking and for creative problem solving*: You will be exposed to, and be required to solve, numerous hydraulics problems in the Lectures, the Tutorials and the assignments - "the learning is in the doing". All these problems will cover a variety of scenarios, and where possible, will be drawn from engineering practice. You will be furnished with the solutions to all problems which will be made available to you on UNSW Blackboard so that you are able to check your analyses.
- *The skills for collaborative* work: Laboratory work completed in small groups of students in a limited time period. The work is to be reported in written form.
- *The skill for effective communication:* Throughout this course, communication is the written variety. In your assignments, a portion of the mark may be allocated to the clarity of your solution methodology. This will be stated in the Assignment.

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 Tutorials. 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.

Private Study	• Review lecture material and reference books. • *Identify questions which you need answered in the next tutorial*. • Reflect and work on the set tutorial problems at the end of each lecture. • Reflect on and complete any assignments issued. • Reflect on class problems. • Check your email regularly.
Lectures	• A complete set of Lecture notes will be made available to you through the UNSW Bookshop and Blackboard. • Complete the solutions to any questions appearing in the question boxes in the lecture notes. • *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.* • Find out what you must learn. • Follow worked examples or clarifications made on the whiteboard or blackboard during classes. • Be alert to any course announcements.

Tutorials	• ***Much of your learning can take place during the tutorials.*** If you work actively in this time, it will free you up for other activities outside of class. • Start solving the problems provided during the lectures. • Be guided by tutors. • Make sure you understand the solution strategies of any Worked Tutorial Problems completed by your tutors. • *Use your time to ask your tutors about any unresolved tutorial or conceptual problems – even if your question relates to matters from previous weeks. Ask questions.*
Assignment	• Demonstrate your knowledge and skills • Demonstrate higher understanding and problem solving capabilities.
Laboratory Work	• 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 (iii) the reasons why the measured results differ from the theoretical values. • Hands-on work to set studies into context.
Email	• From time to time, messages will be sent to you concerning this course. • 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.
UNSW Blackboard	• Solutions to the Tutorial Problems will be made available to you on UNSW Blackboard approximately 1-2 weeks after each Tutorial. • From time to time, other information which will assist you in this course will be made available to you on UNSW Blackboard. This ***will*** include: lecture notes, common errors from past exams and details of the final exam conditions, including the data section at the front of the paper. • Past exam papers and their worked solutions (2007 – 2010) will be made available to you on UNSW Blackboard.
Library	• Online past exam papers, but no worked solutions (2007 - 2010) can be found online under **MyCourse** in the **Library** home page. • References which may be useful to you for this course can be found in the UNSW Library. See the Resources Section in this Course Profile.

EXPECTED LEARNING OUTCOMES

At the end of this course, you will be familiar with the engineering techniques used to analyse and design the basic components of urban drainage, water supply and wastewater systems.

Upon successful completion of Principles of Water Engineering (CVEN2501) you will be able to:

- *Explain* the basic properties of fluids and how these relate to fluid flow.
- *Explain* the fundamental principles of fluid flow in pipes and free surface flows viz continuity, momentum and energy, and know to what situations they can be applied.
- *Assess* energy losses in pipes due to friction and various pipe fittings.
- *Explain* and *describe* the conditions for flows in pipes under which various flow regimes will occur: (i) laminar and turbulent flows, (ii) turbulent flows which are hydraulically rough or hydraulically smooth.
- *Carry out computations* of flows through pipes. This includes being able to identify the data requirements to support such computations.
- *Undertake* a dimensional analysis and make estimates of drag force and carry out computations related to

boundary layers.

- *Explain* the connection between dimensional analysis and physical model testing.

COURSE PROGRAM

The course schedule tabulated below shows the main topics and *approximately* how long will be spent on each topic in lectures. Please note that the lecture durations and sequence of topics is a guide only; there may be some variations. However, details on the associated assessment tasks should not be affected; if they are you will be informed.

Week **Lecturer**	**Starting**	**Lecture and Tutorial Topics** **Monday 2hr Lecture** **Wednesday 1hr Lecture + 2hr Tutorial**	**Text Chapters** **(Approx.)**	**Assessment** **and Other Notes**
1 WLP	28 Feb	Introduction to Course (0.5hr), Fluid Properties (1.5hrs), **Hydrostatics (1hr)** ***No Tutorials in Week 1***	1.8, 1.9 2.1-2.4	Submit your Laboratory group of 4 members per group by e-mail before 5pm Friday 2 March 2012.
2 WLP	05 March	Hydrostatics (1hrs)+Continuity 1 (1hr), **Continuity 1 (1hr)** **Tutorial:** Fluid properties (2hrs)	2.5-2.8 4.1	
3 WLP	12 March	Continuity 2 (2hr)+**Energy 1 (1hr)** **Tutorial:** Fluid properties, Hydrostatics	3.1, 3.3 3.6	Labs commence Wednesday 14 March 2012
4 WLP	19 March	Energy 1 (1hr)+Energy 2 (1hr), **Energy 2 (1hr)** **Tutorial:** Continuity 1, Continuity 2	3.6-3.7	
5 WLP	26 March	Energy 3 (2hrs), **Momentum 1 (1hr)** **Tutorial:** Hand-in, Energy 1	3.6-3.7 3.4	**Hand-in 1** (10%, individual, open book) to be completed in 1 hr during Tutorial on Lectures in Weeks 1-3 (inclusive). (Will be marked by allocated CVEN2501 marker.)
6 WLP	2 April	Momentum 1 (1hr)+Momentum 2 (1hr), **Momentum 2 (1hr)** **Tutorial:** Energy 2, Energy 3	3.4	
	9 April	**Recess Week–*no lectures and no tutorials***		
7 CEB	16 April	Pipe flow (2hrs), **Pipe flow (1hr)** **Tutorial:** Momentum 1, Momentum 2	6.1-6.8	**Assignment** on Pipe Flow (10% individual) issued.
8 CEB	23 April	Dimensional analysis (2hrs), **No Wednesday lecture due to Anzac Day** **No tutorial due to Anzac Day**	1.6, 5.1-5.3	
9 CEB	30 April	Dimensional analysis (1hr), Physical models 1 (1hr+**1hr**) **Tutorial:** Hand-in, Pipe Flow (1hr), Dimensional Analysis (1.5hrs)	5.1-5.3 5.5	**Hand-in 2** (10%, 1hr, individual, open book) held in Tutorial, mainly on Weeks 4 - 6 (inclusive). (Will be marked by allocated CVEN2501 marker.)

10 CEB	07 May	Physical models 2 (2hrs), **Boundary layers (1hr)** **Tutorial:** Dimensional Analysis	5.5 7.1-7.5	**Assignment** (10% individual) ***due***. (Will be marked by allocated CVEN2501 marker.) Labs finish in Week 10.
11 CEB	14 May	Boundary layers (1hr), Drag Force (1hr+**1hr**) **Tutorial:** Physical Models 1, Physical Models 2	7.1-7.5 7.6	
12 CEB	21 May	Guest lecture (1hr), Revision Lecture (1hr) ***No (1hr) Wednesday lecture*** Wednesday 23 May – Manly Vale site visit to Water Research Laboratory (UNSW) and Manly Hydraulics Laboratory (Public Works). Allow 1hr bus trip, 1hr on site and 1hr return bus trip. **Tutorial:** Boundary Layers, Drag Force		On the Wednesday, starting from 8am: bus pick-up point at bus stop on High Street - upper campus (map reference B25). You will be notified of further arrangements. Collect your lab report while you are at WRL.
13	30 May	***No lectures in Week 13*** **Optional Tutorial:** Revision on ***any*** CVEN2501 topic; roll ***not*** marked this Tutorial		All Tutorial Solutions to be made available on UNSW Blackboard by end of Week 13.

ASSESSMENT

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

Component	Value (%)	Lab Report Due Date, Time and Other Comments
Laboratory Preparation Assignment Labs held throughout semester. You will be advised of schedule.	5% (individual work)	Due on arrival to your laboratory session and consists of: 1. Completed OH&S form OHS009 2. Completed Venturi experiment worksheets 3. Completed Continuity experiment worksheets Note: this assessment is not marked but is to ensure that you are adequately prepared to undertake your experiments. All sheets must be completed to be awarded full marks.
Venturi experiment laboratory report (1hr) Labs held throughout semester. You will be advised of schedule. Allow 45 minutes for this experiment.	7.5% (group work)	Due 5pm Wednesday, 2 weeks after completion of experiment. Submit your group's Venturi Lab report (together with the Continuity Lab report) to the appropriately labelled wooden box at the eastern end of the 4th floor of the CE Building. All marked Lab reports will be returned to you ***during the field trip*** when all groups have completed their experiments.
Continuity experiment laboratory report (1hr) Labs held throughout semester. You will be advised of schedule. Allow 45 minutes for this experiment.	7.5% (group work)	Submit with the Venturi experiment laboratory report

Component	Value (%)	Lab Report Due Date, Time and Other Comments
Hand-in 1 (1hr) in Week 5 Tutorial	10% (individual work, open book)	Hand-in to be completed in 1hr during Tutorial. You will need your ***calculator*** to complete the Hand-in. Submit your hand-in to your Tutor ***at end of 1hr***. Your Tutor will pass it on the allocated CVEN2501 Marker. It is planned to return your marked Hand-ins in the Week 7 Tutorial.
Hand-in 2 (1hr) in Week 9 Tutorial (Course material: Weeks 1 to Momentum 2 inclusive)	10% (individual work, open book)	Hand-in to be completed in 1hr during Tutorial. You will need your ***calculator*** to complete the Hand-in. Submit your Hand-in to your Tutor who will pass it on to the allocated CVEN2501 Marker. It is planned to return your marked Hand-ins in the Week 11 Tutorial.
Assignment: Pipe flow assignment due Week 10.	10% (individual work)	6pm Wednesday 9 May in Week 10 in appropriately labelled wooden box at the eastern end of 4th floor of CE Building. Assignments will be marked by allocated CVEN2501 Marker. It is planned to return your marked assignment in the Week 13 Tutorial.
Final examination (2hrs) (Emphasis will be on course material from Weeks 7 to 12).	50% (individual work, closed book)	Final exam will be held in the formal exam period. Data section at front of paper (with given equations, data values for some fluid properties and several graphs) will be made available to you on UNSW Blackboard. This will include the exam conditions (e.g. number of questions, duration and permitted calculators).
Total	**100%**	

Final Exam

The Final Exam is worth 50% of your Final Mark if class work is included, and 100% if your class work is not included.

For your class work mark (for two Labs, two Hand-ins and one Assignment) to be included, you must attain a mark of at least 40% in your Final Exam (out of 100).

If your pure exam mark (%) is higher than your compounded mark (consisting of marks for your final exam, two hand-ins, assignment and laboratory work), the highest of these 2 marks will be adopted as your Final Mark for this course, provided you have satisfactorily completed the other course requirements i.e. hand-ins, laboratory work and the assignment.

DETAILED INFORMATION FOR THE LABORATORY AND WEEK 12 VISIT TO MANLY VALE LABORATORIES

1) Laboratory Work: The laboratory work is a ***compulsory component*** of this course. Your attendance and participation in **all** laboratory work is a requirement for passing the course. Failure to complete or participate in this component will result in a grade of Unsatisfactory Fail (UF) for this course. Your laboratory demonstrator will be keeping a record of attendance at the laboratory work via your submission of your individual *Laboratory Preparation Assignment*.

It is compulsory that you adhere to any OH&S requirements or instructions from your laboratory demonstrator or course coordinators, during or before you participate in the laboratory experiments. Closed footware is an OH&S requirement for entry to University Laboratories.

Only one report per group is required per experiment. The marks will be distributed evenly unless specified otherwise on the front of the report and signed by each member. The cover page of your report must include: (i) names of those members in your group ***who participated***, (ii) your group number, (ii) name of the experiment, and (iii) the date when your group undertook the experiment.

The laboratory work is to be completed in groups of 4. Your group will complete two experiments during a single laboratory session – the time allowed for completing each experiment is 45 minutes (i.e. 1.5 hours for completing both experiments). ***The laboratory sessions will be scheduled separately from your Lecture and Tutorial times.*** The Laboratory work will be undertaken on Wednesdays in four time slots: 9:00 to 10:30; 10:30 to 12 noon; 15:00 to 16:30 and 16:30 to 18:00 starting from Week 3.

If you do not attend your scheduled Laboratory work, *a* penalty of 20% *(of full marks for the missed Labs) will be imposed and you will be required to attend at a later date*. This is necessary to ensure that the laboratory component for all of you is completed within the semester and to avoid disruptions and re-scheduling of lab work which has occurred in past years. If for some reason of illness or misadventure, you miss your scheduled laboratory session, you must submit a Special Consideration to the Course Coordinator within 3 working days. Depending on the Special Consideration, the penalty on the lab work may or may not be applied.

You will be notified by email of the scheduled time for your group's laboratory work. Your marked laboratory reports can only be returned to you during the field trip when all groups have completed their laboratory work. You will be issued with Laboratory Notes on the two experiments in Week 1.

Exemption from Laboratory Work: Please note that ***only*** if you are repeating this course, an exemption from the Labs will be given if you comply with both of the following:

- you must notify the CVEN2501 Course Coordinator with a copy to Dr. Barthelemy by email of (i) your name, (ii) student ID (iii) marks for both labs and (iv) the year to previously undertook CVEN2501 by **5pm Friday, 2 March 2012.**
- your combined lab marks for both experiments must have been equal to or in excess of 60% for the two Laboratory Reports.

No other exemptions for other parts of the course (such as Hand-ins or the Assignment) will be granted.

Where is the Kensington Hydraulics Laboratory and how do you get to it? The Kensington Hydraulics Laboratory is under the Valentine Annexe (map reference H22) next to the multi-storey car park. Access to the Laboratory is through the main entrance of the Civil and Environmental Engineering Building, turn left and proceed eastwards to the end of the corridor past the ground floor lecture rooms, through 2 more doors (still walking in the same easterly direction towards the multi-storey car park), pass through the Concrete Laboratory and into the Hydraulics Laboratory where you will see various flumes.

3) Site Visit to the Manly Vale Laboratories: On the Wednesday of Week 12 (23 May), you will be taken on a site visit of the UNSW Water Research Laboratory (**WRL**) and the Manly Hydraulics Laboratory Public Works (NSW Government Public Works) to view some physical models being used to solve real engineering problems.

Buses will be provided to take you to WRL and return to Kensington. Please note that ***set-downs on the return journey are not permitted***. The laboratories are 22km by road from the Kensington campus. You can make your own way to and from **WRL**. There will be ***no*** 1hr Week 12 Lecture on the Wednesday; depending on the finalised site visit arrangements, the usual 2 hour Wednesday Tutorial may be shortened - see the Lecture Schedule.

The capacity of each bus is about 57. Well before the site visit, you will be asked to nominate a particular bus with its departure (and return) times fixed, to allow the transport of the whole class to and from Manly Vale.

In scheduling the site visit for the day, we allow about 1hr travel time to the Laboratories from Kensington, 1hr total spent at the two Laboratories and 1hr to return to Kensington.

Note that the UNSW Water Research Laboratory is set back from King Street and does ***not*** have a street number, However, it is located next door to Manly Hydraulics Laboratory, Public Works, NSW Department of Service Technology and Administration, which is at 110 King Street, Manly Vale.

If you prefer to make your own way to the Laboratories, feel free to do so. Parking is available (i) on King Street and Sunshine Street near MHL, and (ii) in the WRL car park which is inside the WRL compound. To reach the WRL car park, you drive some 30m past the big blue-grey gates at the entrance to the Laboratory off King Street and turn right at the first opportunity into the car park. Note that the WRL entrance is located on a sharp bend in King

Street, and care needs to be taken when turning off King Street into the WRL driveway. A local map and grounds diagram showing the labs and parking will be made available to you on BLACKBOARD.

OH&S form OHS009 is required to be completed before the visit by everyone attending. Also, it is an OH&S requirement that you wear closed footware (i.e. no thongs or sandals) on this visit to the laboratories.

A separate notice will be communicated to you electronically in Week 9 or 10, giving you more details of the visit i.e. upper and lower campus bus pick-up points, maps of destination (for those of you making your own way).

The only ***assessment*** associated with this visit is that the Final Exam will include a short question based on this visit.

Late Submissions, Attendance Requirements, Laboratory Participation

Late submissions for laboratory reports and the assignment will attract a penalty of 10% (of full marks) per day (includes Saturdays and Sundays).

Hand-ins will not be accepted if they are late.

The minimum UNSW attendance requirement is 80% of all classes, including lectures and tutorials. Attendance at Tutorials may be recorded. You may fail the course if more than 20% absences are recorded. Your attendance and participation in **all** laboratory work is a requirement for passing the course.

Assessment Queries

Should you have any concerns or queries regarding your assessment you MUST submit your concerns in writing to the appropriate wooden box on the 4th floor of the CE building within 2 weeks of the date of concern.

Special Considerations: There are 2 procedures for applying for Special Consideration due to illness or misadventure:

(i) *Missed or affected assessment has a value <20%.* You must furnish the full supporting documentation to the Course Coordinator within 3 working days of the illness or misadventure. The recommended way of lodging the documentation is with the 4th floor School Office, who will place it in the Coordinator's pigeonhole.

(ii) *Missed or affected assessment has a value ≥ 20%.* You must formally furnish the full supporting documentation to the UNSW Student Centre (map reference C22) within 3 working days of illness or misadventure. For the form to be completed, see: **https://my.unsw.edu.au/student/atoz/consideration.pdf**

RESOURCES

Textbook

White, F. M. (2011) *Fluid Mechanics*. 7th Edition, McGraw-Hill, ISBN 978 0 07 128645 9 [University Bookshop; UNSW Library, Level 8, 620.106/77 – 5 copies]

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]
- Cengel, Y. A. and Cimbala, J. M., Fluid Mechanics: Fundamentals and Applications, McGraw-Hill, 2010, 2nd edition, SI version, ISBN 978 0 071 28421 9 [UNSW Library, Level 8, 620.106/73 – 5 copies]

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 Academic Advice on the School website available at:

http://www.civeng.unsw.edu.au/info-about/our-school/policies-procedures-guidelines/academic-advice