Course Outline

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1. Staff Contact Details

Cont t t s n ons t t on t s or o rs on nor

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Consultation concerning this course is available by

t l nt rn n o t o s

This course is designed to address the below learning outcomes and the corresponding Engineers Australia Stage 1 Competency Standards for Professional Engineers as shown. The full list of Stage 1 Competency Standards may be found in Appendix A.

After successfully completing this course, you shou

4. Course schedule

In order to pass the course, you must achieve a total overall scaled mark of at least 50%.

F o E p r nt t on o oo

For the Flow Experimentation you must keep a logbook. The log book will be a bound A4 exercise book containing the date of experiment, observations, notes, calculations, figures and your comments while conducting the experiment. No loose sheets are acceptable. All handouts related to a particular experiment should be appropriately stapled or pasted into the log book. The log book is to be submitted to Dr Payne in Week 12 with the Flow Experimentation report.

F o E p r nt t on ł port

You will be required to write a report on one of the four experiments which have been conducted in the wind tunnel, using the details from your logbook and lecture notes. The specific experiment will be at random, and will be decided by the lecturer, but will be the same experiment for the whole class. Your report is to be submitted to Dr Payne in Week 12 with the Flow Experimentation logbook.

F o E p r nt t on C ss st

The class test in Flow Experimentation will be held in the Wednesday lecture during Week 12. The test will be of one hour duration and will be based on the Flow Experimentation material covered. The test will be of the multiple-choice type.

r s t to A C n ł n ston

There will be a visit to the Australian Maritime College in Launceston, Tasmania, on the Thursday, Friday and weekend during and following Week 11. The visit is to acquaint you with the facilities available including the towing tank for resistance and seakeeping tests, the cavitation tunnel, the model basin, the flume tank, the shiphandling simulator, etc., and the calculations required to extrapolate the resistance and seakeeping results to full size.

H ro n s Ass n nts

There will be four hydrodynamics assignments, as shown below.

Ass n nts

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The preferred set-out of any numerical calculation is similar to the following:

The preferred set-out of any numerical calculation is similar to the following:

$\boldsymbol{W} = \rho \boldsymbol{gV}$ (Equation in symbols)

$= 1.025 \times 9.80665 \times 200$ (Numbers substituted)

$= 2010$ kN (Answer with units)

ss on

Assignments are due on the scheduled day of the class in the week nominated on the previous page, by 5pm and ***are to be submitted via Moodle***.

Late submission of assignments attracts a penalty of five (5) marks for each calendar day the assignment is late. An extension may only be granted in exceptional circumstances. Where an assessment task is worth less than 20% of the total course mark and you have a compelling reason for being unable to submit your work on time, you must seek approval for an extension from the course convenor before the due date. Special consideration for assessment tasks of 20% or greater must be processed through https://student.unsw.edu.au/special-consideration

It is always worth submitting late assessment tasks when possible. Completion of the work, even late, may be taken into account in cases of special consideration.

rt A F o E p r nt t on

o	H D	r	rn n o t o s ss ss
Exp. 1	Wed. Week 9	.	1
Exp. 2	Wed. Week 9	.	2 and 3
Exp. 3	Wed. Week 10	.	2 and 3
Exp. 4	Wed. Wek 10	.	2 and 3
Logbook	Wed. Week 12	5	1, 2 and 3
Report on one experiment	Wed. Week 12	15	1, 2 and 3
A			
CA ED			

rt B H ro n s

o	H D	r	rn n o t o s ss ss
Conservation of mass and Bernoulli's principle	Mon. Week 5	10	4
Conservation of momentum	Mon. Week 7	10	4
Potential flow and stream function	Mon. Week 9	10	4
Towing tank calcs and report	Mon. Week 12	10	5

A

Cr t r

The submissions in Part A are the logbook and laboratory report, and the following criteria will be used:

(a) Logbook — The logbook must contain all the information relevant to each experiment (date, time, venue, handouts), calculations, discussion and conclusions. The information is to be written down on site; calculations, discussion and conclusions can be written later if necessary. You name and student number must be shown clearly, with the family name underlined.

(b) Report — The report is to be in the usual format (introduction, method, results, discussion, conclusion and references), with a School cover sheet.

The following criteria will be used:

- Comparison of results with different meshes, different turbulence models, and the effects of convergence.
- Plots (graphs) of velocity vectors, streamlines, pressure distribution and lift and drag coefficients.
- Validation of results by comparison with experimental data

The assignments in Part B all involve numerical calculations, for which the following criteria will be used:

- Accuracy of numerical answers.
- Use of diagrams, where appropriate, to support or illustrate the calculations.
- Use of graphs, were appropriate, to support or illustrate the calculations.
- Use of tables, where appropriate, to support or shorten the calculations.
- Neatness.

The final assignment in Part B also involves a report on the results, and the following criteria will be used:

- Clarity of communication—this includes development of a clear and orderly structure and the highlighting of core arguments.
- Sentences in clear and plain English—this includes correct grammar, spelling and punctuation.
- Correct referencing in accordance with the prescribed citation and style guide.

E n t ons

The final examination for the course is held during the University examination period in November.

Provisional Examination timetables are generally published on myUNSW in September.

For further information on exams, please see Administrative Matters.

Calculators

You will need to provide your own calculator, of a make and model approved by UNSW, for

It is your responsibility to ensure that your calculator is of an approved make and model, and to obtain an “Approved” sticker for it from the School Office or the Engineering Student Centre prior to the examination. Calculators not bearing an “Approved” sticker will not be allowed into the examination room.

p Cons r t on n pp nt r Ass ss nt

For details of applying for special consideration and conditions for the award of supplementary assessment, see Administrative Matters, available on the School website and on Moodle, and the information on UNSW’s Special Consideration page

6. Expected Resources for students

t oo s

rt A

Relevant materials/notes will be available on the Moodle website.

rt B

Lewis, E.V. (Ed.) (1988), ***Principles of Naval Architecture***, v.3, Motions in Waves and Controllability, Society of Naval Architects and Marine Engineers, Jersey City.

Newman, J.N. (1980), ***Marine Hydrodynamics***, MIT Press, Cambridge, Massachusetts.

Both of these are available in the UNSW Library.

Lewis is available for purchase from the Society of Naval Architects and Marine Engineers, Jersey City, USA. However, the price to non-members exceeds the member price plus the cost of student membership, so it is advisable to join the Society and order the book at the same time.

st t on r n s

F o E p r nt t on

Barlow, J.B., Rae, W.H. Jr. and Pope, A. (1999), Low-speed Wind Tunnel Testing, 3rd

A t on t r s pro n oo

This course has a website on Moodle which includes:

- relevant material/notes for flow experimentation;
- copies of hydrodynamics assignments
- previous examination papers;
- answers to the numerical questions in hydrodynamics examinations; and
- a discussion forum.

The discussion forum is intended for you to use with other enrolled students.

t r i so r s

Appendix A: Engineers Australia (EA) Professional Engineer Competency Standards

	Program learning outcomes
Bachelor of Engineering (Honours)	PE1.1 Comprehensive, theory-based understanding of underpinning fundamentals PE1.2 Conceptual understanding of underpinning math