

Course outline

Semester 2 2016

NAVL3710

Ship Propulsion and Machinery
(formerly Ship Standards and
Marine Engineering)

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Contact hours

	Day	Time	Location
Lecture: Part C – Dr Chowdhury	Wednesday	2pm – 3pm	Mathews 228
Lecture: Part B - Mr Lyons	Tuesday EVEN WEEKS 2,4,6,8	3pm – 5pm	Mathews 227 (except Week 8 13/9/16 in Ainsworth 204 CAD lab)
	Wednesday	3pm – 5pm	Mathews 228
Lecture: Part C – Dr Chowdhury	Friday	9am – 10am	Mathews 228
Lecture: Part A - Mr Spruge Week 1/Mr Atack Week 2 onwards	Friday	10am – 12noon	Mathews 228

Summary of the course

This course (formerly known as Ship Standards and Marine Engineering) focuses on the ship propulsion train and auxiliary machinery required, ship resistance and the prediction of the power required for propulsion and shipbuilding contracts and equipment. It is divided into:

- Part A – Machinery
- Part B – Resistance, Powering & Propulsion
- Part C – Contracts & Equipment

Aims of the course

This course enables you to explore the principal means of ship power (diesel engines, gas turbines, steam turbines, diesel electric, etc.), the transmission system, and the requirements of the auxiliary machinery for hotel loads.

You are also given the tools of current numerical methods of resistance prediction so that you can predict the power required to provide a contracted speed or, for a tug, a contracted bollard pull. Propeller design and waterjet installations are studied and design procedures are learned.

This course uses the ship terminology which you learned in NAVL3610. It uses thermodynamic principles from MMAN2700 and electrical principles from ELEC1111, and builds on the report-writing skills which you commenced in ENGG1000.

19/10/16	12		x		Part C - Ship piping systems; Part B - Resistance & Powering: Catamaran resistance prediction: Zips, Muller-Graf, Scott, Wong, and slender-body methods Propulsion: Practical waterjet design
21/10/16				x	Part C - Ship piping systems; Part A - SOLAS systems and automation
26/10/16	13		x		

5. Assessment

Assessment overview

Part A: Machinery						
No.	Assignment	Weight	Learning outcomes assessed	Assessment criteria	Due date and submission requirements	Marks returned:
1	Terminology	3.33%	1	Correct identification and usage		

Exam		20%	3-7	All Part B content.	Examination period: 4-19/11/16	After release of results
Part C: Contracts & Equipment						
No.	Assignment	Weight	Learning outcomes assessed	Assessment criteria	Due date and submission requirements	Marks returned:
1	Tendering and contract management	3.33%	8	Specifying contractual details	Week 4: 19/8/16	2 weeks after submission
2	Steel structure to rule reqmts	3.33%	9	Analysing contractual details	Week 6: 2/9/16	2 weeks after submission
3	Shafting and rudder calculations	3.33%	9	Analysing contractual details	Week 10: 7/10/16	2 weeks after submission
4	Sea trials	3.33%	9	Specifying contractual details	Week 12: 21/10/16	2 weeks after submission
Exam		20%	8, 9	All Part C content.	Examination period: 4-19/11/16	After release of results

Assignments

Presentation

All submissions should have a standard School cover sheet which is available from this course's Moodle page.

All submissions are to be neatly typed and clearly set out . Presenting them clearly gives the marker the best chance of understanding your method; even if the numerical results are incorrect.

Submission

Part A: By hard copy in-class.

Part B: By email to david.lyons@unsw.edu.au

Part C: By hard copy in-class.

Late submissions will be penalised 5% of the available marks per calendar day (including weekends). 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 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.

Examinations

You must be available for all tests and examinations. The final School examinations (Paper 1: Parts A&B; Paper 2: Parts C&D, 2 hours each) for this Course will be held during the University examination period 4-19 November 2016.

Provisional examination timetables are generally published on myUNSW in September for Semester 2.

For further information on exams, please see the [Exams](#) section on the intranet and contact the Course convenor.

Calculators

You will need to provide your own calculator, of a make and model approved by UNSW, for the examinations. The list of approved calculators is shown at student.unsw.edu.au/exam-approved-calculators-and-computers

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.

Special consideration and supplementary assessment

For details of applying for special consideration and conditions for the award of supplementary assessment, see the School [intranet](#), and the information on UNSW's [Special Consideration page](#).

6. Expected resources for students

Part A – Machinery

Students are given extensive lecture notes and Powerpoint presentations by the lecturer which are uploaded to Moodle.

Part B – Resistance, Powering and Propulsion

The Bentley Systems Maxsurf Resistance software is available for use in Ainsworth 204. Shortly, propeller design software will also be installed.

Part C – Contracts & Equipment requires the following:

AGPS - Uniform Shipping Laws Code, Subsection 5L Steel Structure (available in the UNSW Library or downloadable from the AMSA website www.amsa.gov.au)

Standards Australia, AS4132.1 Design Loads, AS 4132.2 Aluminium Structure, and AS4132.3 FRP Structure are available online via the UNSW Library website,

Taylor, D.A. (1996), *Introduction to Marine Engineering*, Butterworth Heinemann, London.

Except for Hall (1999), these are all available in the UNSW Library and are useful as additional reading material.

Rowen et al. (2005) is also available for purchase from the Society of Naval Architects and Marine Engineers, Jersey City, USA. However, the price to non-members (of any one book) exceeds the member price plus the cost of student membership, so it is advisable to join the Society and order the books at the same time. Please see the course convenor for an application form if you wish to do this.

Part B – Resistance, Powering and Propulsion

Lewis, E.V. (Ed.) (1988), *Principles of Naval Architecture*, v.2, Resistance, Propulsion and Vibration, Society of Naval Architects and Marine Engineers, Jersey City.

MacPherson, D. (1993), Reliable Performance Prediction: Techniques Using a Personal Computer, *Marine Technology*, v.30, n.4, October (also available online from www.hydrocompinc.com/knowledge/library.htm).

Paulling, J.R. (2010), *Principles of Naval Architecture: Ship Resistance and Flow*, Society of Naval Architects and Marine Engineers, Jersey City.

Carlton, J.S. (2008), *Marine Propellers and Propulsion*, 2nd Ed., Butterworth-Heinemann, London.

O'Brien, T.P. (1962), *The Design of Marine Screw Propellers*, Hutchison, London.

Paulling, J.R. (Ed.) (2010), *Principles of Naval Architecture: Propulsion*, Society of Naval Architects and Marine Engineers, Jersey City.

Saunders, H.E. (1957), *Hydrodynamics in Ship Design*, v.1 and v.2, Society of Naval Architects and Marine Engineers, Jersey City.

Part C – Contracts and Equipment

Fisher, K.W. (2004) *Shipbuilding Specifications: Best Practice Guidelines*, *International Journal of Maritime Engineering*, Royal Institution of Naval Architects, London, March

Lamb, T. (Ed.) (2003), *Ship Design and Construction*, Vol. 1, Chapter 4, Society of Naval Architects and Marine Engineers, Jersey City.

Additional materials provided in Moodle

This course has a website on UNSW Moodle which includes:

- copies of assignments (as they are issued), otherwise issue in-class;
- previous examination papers in this course from 2010 onwards;
- answers to the numerical questions in examinations from 2010 onwards; and
- a discussion forum.

The discussion forum is intended for you to use with other enrolled students. The course convenor will occasionally look at the forum and take note of any frequently-asked questions, but will not respond to questions on the forum. If you want help from the convenor then direct contact is preferred.

Recommended internet sites

There are many websites giving lectures, papers and data on ship terminology and design..

entire powering and propulsion train from the engines to the propeller are treated as a whole in order to meet the powering requirements that are assessed in order to overcome the vessel's resistance.

8. Academic honesty and plagiarism

UNSW has an ongoing commitment to fostering a culture of learning informed by academic integrity. All UNSW students have a responsibility to adhere to this principle of academic integrity. Plagiarism undermines academic integrity and is not tolerated at UNSW. Plagiarism at UNSW is defined as using the words or ideas of others and passing them off as your own.

Plagiarism is a type of intellectual theft. It can take many forms, from deliberate cheating to accidentally copying from a source without acknowledgement. UNSW has produced a website with a wealth of resources to support students to understand and avoid plagiarism: student.unsw.edu.au/plagiarism The Learning Centre assists students with understanding academic integrity and how not to plagiarise. They also hold workshops and can help students one-on-one.

You are also reminded that careful time management is an important part of study and one of the identified causes of plagiarism is poor time management. Students should allow sufficient time for research, drafting and the proper referencing of sources in preparing all assessment tasks.

If plagiarism is found in your work when you are in first year, your lecturer will offer you assistance to improve your academic skills. They may ask you to look at some online resources, attend the Learning Centre, or sometimes resubmit your work with the problem fixed. However more serious instances in first year, such as stealing another student's work or paying someone to do your work, may be investigated under the Student Misconduct Procedures.

Repeated plagiarism (even in first year), plagiarism after first year, or serious instances, may also be investigated under the Student Misconduct Procedures. The penalties under the procedures can include a reduction in marks, failing a course or for the most serious matters (like plagiarism in an honours thesis) even suspension from the university. The Student Misconduct Procedures are available here:

www.gs.unsw.edu.au/policy/documents/studentmisconductprocedures.pdf

Further information on School policy and procedures in the event of plagiarism is available on the [intranet](#).

9. Administrative matters

Appendix A: Engineers Australia (EA) Stage 1 Competencies for Professional Engineers

	Program Intended Learning Outcomes
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PE1: Knowledge
and Skill Base