

Course Title: **Ship Design and Production**

Course Code: **ENMA601**

Descriptor Start Date: **31/01/2023**

Descriptor End Date: **09/07/2024**

POINTS: **15.00**

LEVEL: **6**

PREREQUISITE/S: **None**

COREQUISITE/S: **ENMA600**

RESTRICTION/S: **None**

## LEARNING HOURS

Hours may include lectures, tutorials, online forums, laboratories. Refer to your timetable and course information in Canvas for detailed information.

**Total learning hours: 150**

## PRESCRIPTOR

This course introduces the student to the overall philosophy, rational thought process and engineering techniques required for the conceptual design of marine structures, ocean vehicles and maritime engineering systems. The course will also introduce the student to the concepts of engineering ethics, human factors, and sustainability in the context of maritime engineering design. The student will be expected to apply problem solving, design and decision-making methodologies to meet client requirements and to comply with regulatory and industry specific constraints by formulating innovative solutions with intellectual independence. The knowledge gained in this course will be fundamental for future degree specific design courses as well as for the final year capstone design project

**Disclaimer: Course descriptors may be amended between teaching periods/semesters**

## LEARNING OUTCOMES

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1. Effectively use 3D hull modelling software to model a hull and fit internal structures (1,2,3)
2. Demonstrate knowledge of regulatory, practical and economic constraints on design. (1,3,4,5,8,9)
3. Produce a limited set of design drawings to industry standards. (1,3)
4. Develop a concept design based on an appraisal of operational requirements via a clearly structured and rational process. (1,2,3,4,8,9)
5. Shortlist fundamental integral systems for a concept design. (3)
6. Identify issues regarding the methodology and efficiency of production for any particular vessel. (1,2,3,4,9)
7. Recognise the concepts of vessel production, system design & main elements of vessel propulsion.. (1,2,3,9)
8. Demonstrate knowledge of the integral processes within vessel production engineering and associated current technologies. (1,2,3,4,9)
9. Explain the principles of quality management in the design and construction of vessels. (3,4,8,9)

## CONTENT

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### Ship design

- Vessel Types
- Hull Forms
- Freeboard & Loadline
- Terminologies & Definitions
- Design Process & Constrains
- Design Analyses and Techniques
- Documentation
- Structural Systems
- Propulsor and Prime Mover Options
- Primary Deck Machinery & Installation Considerations
- CAD Laboratories – Maxsurf.

### Ship Production

- Introduction, Shipbuilding Process & Definitions
- Ship Production History & Strategic factors
- Design & engineering for Ship Production
- Ship Construction, Materials and welding process
- Ship Yard Layout
- Launching & Dry Docking
- Preparation for launching & Dry-docking, loads process, Sea trial and commissioning

### Key to graduate capabilities profile:

1. Knowledge of Engineering Sciences
2. Analysis and Problem solving
3. Design and Synthesis
4. Investigation and research.
5. Risk Management
6. Team Work
7. Communication
8. The Engineer and Society
9. Management and Financial
10. Practical Knowledge

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## LEARNING & TEACHING STRATEGIES

Lecture, Tutorial and online PowerPoints, videos and other resources.

## ASSESSMENT PLAN

Assessment Event	Weighting %	Learning Outcomes
Ship Design Project Assignment	70.00	1-5
Final Problem Solving Questionnaire	30.00	2, 4-9

### Grade Map

#### MAP1

A+ A A- Pass with Distinction

B+ B B- Pass with Merit

C+ C C- Pass

D Fail

### Overall requirement/s to pass the course:

To pass the course, students must satisfy the stated learning outcomes and achieve a minimum overall grade of C-.

## LEARNING RESOURCES

REQUISITE TEXTS: P. Furness, M. Symes, D. Harte, Ship Design & Production, Lecture & reference Notes, Course reader AMC RECOMMENDED READING: For Ship Design: - Eyres, D., J., Bruce, G., Ship Production [7th Edition], ButterworthHeinemann, 2012 - Lamb, T. (Editor) Ship Design & Construction [3rd Edition] Vols. 1 & 2, S.N.A.M.E., Jersey City, N.J. 2003-04. - Lewis, E.V., (Editor), Principles of Naval Architecture (Vol. 1), S.N.A.M.E., Jersey City 1988 - SOLAS Consolidated Edition, 2004, Consolidated text of the International Convention for the Safety of Life at Sea, 1974 and its Protocol of 1988, IMO, London 2004 - Code on Intact Stability for All Types of Ships Covered by IMO Instruments, Resolution A.749 (18), IMO, London 1995 - Lamb, T. (Editor) Ship Design & Construction [3rd Edition] Vols. 1 & 2, S.N.A.M.E., Jersey City, N.J. 2003-04 For Ship Production: - Taggart, R. (Ed), Ship Design and Production, SNAME, New York, 1990. - Boundy. A.W., Engineering Drawing. McGraw Hill, 2007 - Formation Design Systems, Online Reference Manuals for Maxsurf. - AS/ISO 128.25-2005 Technical drawings-General principles of presentation. Part 25 Lines on shipbuilding drawings. - Online articles are available at: <http://www.newavesys.com/articles.htm> - In particular: 'A review of the concepts of computer generated hull modeling' is available at: <http://www.newavesys.com/secrets.htm>

**For further information, contact:** Te Ara Auaha - Faculty of Design & Creative Technologies

**Principal Programme:** AK3751, Bachelor of Engineering (Honours)

**Related Programme/s:**

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