Liverpool John Moores University

Title:	SHIP PROPULSION AND DESIGN
Status:	Definitive
Code:	**6098ENG** (115986)
Version Start Date:	01-08-2018
Owning School/Faculty:	Maritime and Mechanical Engineering
Teaching School/Faculty:	Maritime and Mechanical Engineering

Team	Leader
Jin Wang	Y

Academic Level:	FHEQ6	**Credit Value:**	20	**Total Delivered Hours:**	66
Total Learning Hours:	200	**Private Study:**	134		

Delivery Options
Course typically offered: Standard Year Long

Component	Contact Hours
Lecture	42
Tutorial	21

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	AS1	Examination	70	3
Report	AS2	Ship Design Assignment	15	
Report	AS3	Propulsion System Assignment	15	

Aims

To examine in detail the ship design process, integrating the various design elements for new and existing vessels.

Learning Outcomes

After completing the module the student should be able to:

1	Critically review the elements in ship design, the powering of ships, design features and general arrangement.
2	Make appropriate estimations for ship design parameters.
3	Apply the principles concerning model testing, ship trial and manoeuvrability.
4	Outline problems associated with ship surface protection and roughness.
5	Describe engine exhaust emissions, major marine hazards and major marine control systems.
6	Analyse different types of power transmission systems and calculate power outputs of engine plant as well as different types of gear transmission systems, clutches and couplings.
7	Determine optimum power transmission for particular installations and select a propulsion system for different types of ships.
8	Analyse shaft vibrations, engine balancing and different types of propellers.

Learning Outcomes of Assessments

The assessment item list is assessed via the learning outcomes listed:

EXAM	1	2	3	4	5	6	7	8
Ship Design Assignment	2	3						
Propulsion System Assignment	7	8						

Outline Syllabus

Estimations for main dimensions, tonnages and design coefficients for a vessel.
Estimates of resistance and powering.
Design considerations of rudders, propellers and manoeuvring mechanisms.
Manoeuvring characteristics and stability effects.
Design considerations of main propulsion and auxiliary machinery.
Matching requirements of engine, propeller and hull.
Casualty evaluation, damage control, fire fighting and emergency plans.
Acceptance trials.
Inspection and maintenance, dry docking routines and preparation.
Ship surface protection and roughness.
Marine hazard prevention.
Marine control systems.
Diesel engine plant, steam and gas turbines.
Boiler plant.
Power development in engines.
Fuel, combustion, analysis and impurities.
Emission control and regulations.
Thermodynamic cycles and analysis.
Propeller, integration of propeller, marine propulsion system and ship hull.
Power transmissions; systems, engine balancing, gearing, clutches, shaft systems (Holzer method).

Learning Activities

By a series of lectures and tutorials.

Notes

To trace the total ship design and redesign processes from setting parameters, to estimate performance and costs to testing the resulting product.
To develop an understanding as to the requirements of the marine industry with respect to propulsion and auxiliary plant for ships.
To enable an individual to appreciate different types of marine plant and determine the optimum plant for particular installations.