

FU	FREDERICK UNIVERSITY		MAR511/1
	Course Outline		
Course Code:	MAR511		
Course Title:	Marine auxiliary equipment		
Level:	Postgraduate career-based course		
Credits:	6 ECTS		
Department:	Maritime Transport and Commerce / Mechanical Engineering		
Pre-requisites:	BSc or BEng Mechanical Engineering (or appropriate equivalent)		
Introduction and Rationale:			
<p>Modern merchant vessels are complex engineering structures dependent for their operation on a wide variety of mechanical, electrical and electronic systems. Good knowledge and in depth understanding of these systems therefore constitutes a major part of the marine engineering curriculum. Most of these systems are common to many types of vessels although the degree of importance and engineering complexity might vary from case to case and is subject to engineering development and progress.</p>			
Aim:			
<p>The aim of the course is to provide the fundamental engineering knowledge of common traditional marine engineering systems while introducing technology evolution as appropriate for each case, to meet the requirements of the International Maritime Organisation (IMO) Standards of Training and Certification of Watchkeepers (STCW) for Engineering Officer of the Watch (EOOW) at operational level.</p>			
Learning Outcomes:			
<p>On completion of this course the student will know:</p> <ul style="list-style-type: none"> • Explain the purpose and use of legislation and legislative organisations; Administrations, Classification Societies, MARPOL, M-Notice types, H&S at work, IMO, SOLAS, ISM, STCW, COSWP • Watchkeeping requirements for safe and efficient operation of engine room and auxiliary equipment spaces. Describe watchkeeping activities required for the safe and efficient operation of the vessel. State the procedures for accepting and handing over a watch and requirements for UMS operations. State the documents used explaining their use and importance. • Define an enclosed space, stating the enclosed space entry procedure, explaining the dangers that may be encountered. • Understands the importance of the Permit to Work system. • Knows how to access Material Data Safety Sheets (MSDS) and interpret their contents. • Has a knowledge of the type approval procedures. • Operation and procedures for ballast, bilge and oil transfer systems. • Sketch and describe bilge, bilge injection, ballast systems. Identify problems that may occur and state their causes. • Describe fuel transfer procedures with reference to stability considerations. • Describe the operation of a basic refrigeration system, referring to the condition of the 			

	<p>refrigerant at cardinal points. Diagnose faults from given symptoms, describe the charging and recovery of refrigerant.</p> <ul style="list-style-type: none"> • Sketch and describe the operation of sewage systems, fresh water generators including potable water treatment. • Describe the operation of control and start air compressors, stating the starting and stopping sequence and the purpose of the safety devices fitted. • Describe the procedure for starting and stopping auxiliary engines including first start arrangement. • Explain the principle of operation of centrifugal separators, including the importance of the correct gravity disc, speed, flow rate, temperature. Differentiate between purifier and clarifier. Explain the consequences of water contamination of fuel and lubricating oil. • Sketch and describe a centrifugal pump, explaining its operating principle, stating possible faults and their causes. Describe priming methods. Sketch and describe positive displacement pumps, explaining why they need relief valves. • Operation and construction of heat exchangers, stating their advantages/disadvantages. • State the checks to be made on the steering gear prior to leaving port. • Describe the pollution prevention procedures and equipment, spillage procedures, bunkering procedure. • Fire detection and fire fighting equipment and procedures. Describe the construction and operation of portable fire extinguishers. State their identification and placement. State the classes of Fire and the actions to be taken on discovering a fire. Describe the organisation of fire parties and emergency parties. Describe the testing of CABA. State the preparations required before operating fixed fire fighting installations. Describe the construction, operation and testing of fire detector heads. • Sketch and describe the operation of oil water separators, explaining their operating principles. State the MARPOL requirements, describe the associated documentation required. • State the importance of the main propulsion thrust bearing, describing its operation and the importance of the oil temperature. • Describe the starting and maintenance of lifeboat engines. Explain how the fall of a lifeboat is controlled.
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Main Learning and Teaching Activities:

Lectures will provide a conceptual framework of all key areas. Students will work individually and/or in groups for their assignments. Computer based learning packages, simulation, Universities resources and industrial visits will support familiarisation with the various types of marine equipment where applicable. Guest lecturers from industry will supplement practical input and experience whenever possible.

Assessment Details:		
Method of assessment	Weighting %	Outline detail
Coursework	40%	2 individual assignments: 1 assignment on Auxiliary Marine Equipment (part 1) 1 assignment on Auxiliary Marine Equipment (part 2)
Examination	60%	Closed book 3 hour combined written exam