

REM master basic syllabus

Title:

NM962 Advanced Marine Structures

Credit value:

5 ECTS

Mandatory/Optional:

Mandatory

Semester:

1

Lecturer/s:

Piero Caridis

University:

University of Strathclyde

Department:

Naval, Ocean and Marine Engineering

Rationale:

This module aims to provide students with an understanding of the response of surface ships, at both a global and local level. Structural analysis and design will both be discussed.

Objectives:

To provide students with:

- 1. An understanding on the nature of ship hull structures, the role of various components and ship structural design issues.*
- 2. An understanding of load action and its effects at local and global level.*
- 3. An understanding of how to analyse the global response of surface ships.*
- 4. An understanding of the basics of ship hull girder analysis at a local level.*
- 5. An understanding of a systematic ship structural design procedure at a global level.*

Skills: *(according to the list of skills provided)*

Subject skills	REM Master Skills						
	L2.1	L2.2	L2.3	L2.4	L2.5	L2.6	L2.7
L3.1. <i>An understanding on the nature of ship hull structures, the role of various components and ship structural design issues</i>	X	X				X	X
L3.2. <i>An understanding of load action and its effects at local and global level.</i>	X	X				X	X
L3.3. <i>An understanding of how to analyse the global response of surface ships.</i>	X	X				X	X
L3.4. <i>An understanding of the basics of ship hull girder analysis at a local level.</i>	X	X				X	X
L3.5. <i>An understanding of a systematic ship structural design procedure at a global level.</i>	X	X				X	X

Teaching and learning methods:

Description of the methodology: lectures, lab, group presentations...

The teaching method is based on a series of lectures where the lecturer explains the main concepts through power point presentations and worked out examples on the board. The students are also presented with a variety of issues of practical nature during the lectures. To support the learning process part of the modules covers tutorial-like sessions where the students are put to the challenge of working together and addressing problems of slight higher technical complexity

Allocation of student time:

	Attendance (classroom, lab,...)	Non attendance (lecture preparation, self study...)
Lectures	22 hours	22 hours
Tutorials	11 hours	11 hours
Private study		59 hours

Assessment:

The module comprises lecture presentations and tutorials supported by online resources and consultation sessions. Feedback and assessment is achieved through:

- *Interactive learning in class to ensure student comprehension of key concepts.*
- *Criteria and weightings used in the assessment process will be included in the assignment handout.*
- *Consultation feedback sessions, including advice on assessment criteria for their prepared coursework solutions prior to the submission of their assignments.*
- *Feedback against assessment criteria will be provided to the students once the grading process has been completed.*

Assessment Matrix:

Subject skills	Assessment method					
	Exam	Presentation	Coursework	projects
L3.1-L3.5	100%					

Programme:

Lesson 1	<i>Introduction to ship structures and structural design principles</i> <i>Distribution (5 h theory + 2 h tutorials)</i>
Lesson 2	<i>Loads acting on ship structures</i> <i>Distribution (5 h theory + 3 h tutorials)</i>
Lesson 3	<i>Longitudinal strength of surface ships</i> <i>Distribution (3 h theory + 2 h tutorials)</i>
Lesson 4	<i>Analysis and design of columns and beam-columns</i> <i>Distribution (3 h theory + 2 h tutorials)</i>
Lesson 5	<i>Analysis and design of un-stiffened and stiffened plated structures</i> <i>Distribution (3 h theory + 1 h tutorials)</i>
Lesson 6	<i>Design of hull girder mid-ship section components from first principles</i> <i>Distribution (3 h theory + 1 h tutorials)</i>

Resources:

Classrooms, Blackboard, laptop, projector, audio, computer room, laboratory, security issues, ...

A classroom, equipped with a blackboard and audio-visual resources (laptop/computer with Matlab/Simulink installed and Internet connection + projector), for the lectures. A blackboard and a projector may be sufficient if the lecturer uses her/his own laptop.

Bibliography:

Basic textbooks, deepening bibliography, Internet addresses of interest, specific journals, etc...

The course notes provided contain material that exceeds the course teaching and examination requirements. The chapters distributed have been extracted from a two volume text currently in preparation for publication. Students are expected to note the material covered during classes which will all be examinable material. The tutorial exercises ought to be treated as a guide for the preparation for the written examination.

Hughes O.F. Paik J.K Ship Structural Analysis and Design SNAME 2010.

Mansour A., Liu D. The Principles of Naval Architecture Series: Strength of Ships and Ocean Structures SNAME

Further comments: