ShipMarTech Course Syllabus

<table>
<tr><td>Course title</td><td>Ship Seakeeping</td></tr>
<tr><td>Course number/code</td><td>U2572</td></tr>
<tr><td>Credits/ECTS</td><td>9 ECTS</td></tr>
<tr><td>Total contact and self-study load/hours</td><td>72 hours of frontal lessons + 153 self study</td></tr>
<tr><td>Prerequisites/co-requisites</td><td>Ship Stability – Resistance - Propulsion</td></tr>
<tr><td>Level and type (compulsory, elective)</td><td>Masters’ compulsory course</td></tr>
<tr><td>Description</td><td>Content. Topics.

Wave Theories; Statistical Description of Sea; Frequency Domain Analysis Of Waves; Ship Response In Regular Waves; Ship Behavior In Rough Sea; Seakeeping Criteria In Ship Design; 2nd Order Phenomena;.</td></tr>
<tr><td>Objectives</td><td>The objectives of the Seakeeping Course are:
To provide the physical and mathematical model of wave theories and statistical description of sea, linearized ship behaviour in regular waves and in irregular sea
To make students capable to perform the seakeeping analysis and evaluate ship operability at the design stage</td></tr>
<tr><td>Intended learning outcomes</td><td>Upon successful completion of this course, students will be able to:<table><tr><th>No</th><th>Intended learning Outcome (ILO)</th></tr><tr><td>1</td><td>Understand the mathematical model for ship behaviour in rough sea;</td></tr><tr><td>2</td><td>Understand of pros and cons of different theoretical, numerical and experimental methodologies used in seakeeping of ships and offshore structures</td></tr><tr><td>3</td><td>Set up a problem and use of properly selected tools and methods.</td></tr><tr><td>4</td><td>Define the seakeeping criteria and perform the seakeeping operability analysis at the design stage.</td></tr></table></td></tr>
<tr><td>Teaching and learning formats and methods</td><td>Development is promoted through the following teaching and learning methods:
The student attends the class presentations and participates in the discussions.
The student independently watches recommended video and discusses them in the class
Practical lessons in the Towing Tank with the assignment to analyse the measured data
4 Homework assignments
Student writes 4 technical reports</td></tr>
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<tr><td>Learning resources, readings, references</td><td>Textbook, class handouts, some instructor keynotes, selected YouTube videos, and access to a personal computer and the internet.

A- Required book(s), assigned reading and audio-visuals:

• Lecture notes

B- Recommended book(s), material and media:

• O.M. Faltinsen: Sea Loads on Ships and Offshore Structures, Cambridge University Press

• J.M.J. Journee: Offshore Hydromechanics, Delft University of Tecnology

• A.R.J.M. Lloyd: Seakeeping – Ship Behaviour in Rough Water, John Wiley & Sons

• J. Matusiak: Dynamics of Rigid Body, Aalto University – Learning Material

• DNV_GL_Loads_RP-C205_2019

• J. N. Newman: Marine Hydrodynamics, 40th anniversary edition. Cambridge, The MIT Press, 2017

• Bertram, Volker. (2012). Practical Ship Hydrodynamics (2nd Edition). Elsevier.

• Different scientific papers available on the professor's homepage</td></tr>
<tr><td>Evaluation tools/methods</td><td>Opportunities to demonstrate achievement are provided through the following assessment tools:

<table><tr><th>Assessment tool</th><th>Mark</th></tr><tr><td>Homework assignments</td><td>10 %</td></tr><tr><td>Project reports</td><td>45 %</td></tr><tr><td>Final exam</td><td>45 %</td></tr><tr><td>Total</td><td>100%</td></tr></table></td></tr>
<tr><td>Assessment criteria</td><td>Final mark is obtained as the combination of the result of oral exam (2 theoretical questions) and technical reports.</td></tr>
<tr><td>Technical requirements</td><td>The student should have a computer and internet connection. Software license provided by University</td></tr>
<tr><td>Additional information</td><td>None</td></tr>
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