

### ShipMarTech Course Syllabus

<b>Course title</b>	Ship structures and constructions (Costruzioni Navali)												
<b>Course number/code</b>	03354												
<b>Credits/ECTS</b>	9												
<b>Total contact and self-study load/hours</b>	72/153												
<b>Prerequisites/co-requisites</b>	Ship construction technology, ship buoyancy and stability, structural mechanics												
<b>Level and type (compulsory, elective)</b>	Bachelor compulsory course												
<b>Description</b>	<p>Content. Topics.</p> <p>The covered topics include:</p> <ul style="list-style-type: none"> <li>• Classification of loads on ship structures based on frequency (static vs dynamic) and on ship response (global vs local).</li> <li>• Definition of primary (hull girder), secondary and tertiary structure</li> <li>• Definition and calculations of hull girder actions in still water</li> <li>• Definition of hull girder actions in waves and wave loads. Calculation of vertical shear force and bending moment by means of quasi-static method.</li> <li>• Definition of hull girder vibrations, and estimation of the two-nodes flexural natural frequency (Todd's Method)</li> <li>• Definition of ultimate strength and calculation of the ultimate moment for a barge</li> <li>• Yielding checks: direct approach vs IACS approach</li> <li>• Notes on torsional moments and buckling</li> <li>• Local loads: isolated beam approach</li> <li>• Section moduli, stress and strain for a beam</li> </ul>												
<b>Objectives</b>	<ol style="list-style-type: none"> <li>1. Approach the student to the basis of ship structural design</li> <li>2. Present and classify the loads applied to the hull</li> <li>3. Provide the theoretical background for understanding standard calculations regarding hull girder and local structural members</li> <li>4. Introduce students to classification society rules on ship structural design</li> </ol>												
<b>Intended learning outcomes</b>	<p>Upon successful completion of this course, students will be able to:</p> <table border="1"> <thead> <tr> <th>No</th><th>Intended learning Outcome (ILO)</th></tr> </thead> <tbody> <tr> <td>1</td><td>distinguish between loads on ship structures and choose the proper structural scheme and method</td></tr> <tr> <td>2</td><td>calculate, by means of excel data sheet, the main loads on hull girder.</td></tr> <tr> <td>3</td><td>understand the limits of applicability of the methods and check qualitatively the obtained results.</td></tr> <tr> <td>4</td><td>read the classification society rules and understand the theory behind them.</td></tr> <tr> <td>5</td><td>estimate ship scantlings by means of isolate beam approach</td></tr> </tbody> </table>	No	Intended learning Outcome (ILO)	1	distinguish between loads on ship structures and choose the proper structural scheme and method	2	calculate, by means of excel data sheet, the main loads on hull girder.	3	understand the limits of applicability of the methods and check qualitatively the obtained results.	4	read the classification society rules and understand the theory behind them.	5	estimate ship scantlings by means of isolate beam approach
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<b>Teaching and learning formats and methods</b>	<p>Development is promoted through the following teaching and learning methods:</p> <ul style="list-style-type: none"> <li>• The student attends the class presentations and participates in the discussions</li> </ul>												

	<ul style="list-style-type: none"> <li>The student discusses in class on the outcomes of true-false quizzes</li> <li>The student attends the class exercises and learns by applying the studied methods.</li> <li>The student completes at home the assignment tasks not concluded in class, supported by guidelines provided by the teacher</li> <li>The student reads the teaching material supported also by audio-visual materials</li> </ul>										
<b>Learning resources, readings, references</b>	<p>Textbook, lecture slides, guidelines for the assignment tasks, selected YouTube videos, and access to a personal computer and the internet.</p> <p>A- Required books:</p> <p>Ship Design and Construction SNAME 2003</p> <p>RINA Rules, part B</p> <p>Principles of Naval Architecture</p> <p>B- Recommended readings:</p> <p>Global hull girder response by Varsta et al Pages 1-7</p> <p>Ship structural design by Hughes</p> <p>Links to you-tube videos are available within lecture slides</p>										
<b>Evaluation tools/methods</b>	<p>Opportunities to demonstrate achievement are provided through the following assessment tools:</p> <table border="1"> <thead> <tr> <th>Assessment tool</th><th>Mark</th></tr> </thead> <tbody> <tr> <td>Written exam</td><td>30%</td></tr> <tr> <td>Assignment report and presentation</td><td>30%</td></tr> <tr> <td>Oral exam</td><td>40%</td></tr> <tr> <td><b>Total</b></td><td><b>100%</b></td></tr> </tbody> </table>	Assessment tool	Mark	Written exam	30%	Assignment report and presentation	30%	Oral exam	40%	<b>Total</b>	<b>100%</b>
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<b>Assessment criteria</b>	Written and oral examination, evaluation and discussion of the report										
<b>Technical requirements</b>	The student should have a computer and internet connection. MS office required										
<b>Additional information</b>	None										