**Degree competences to which the subject contributes**

**Specific:**

1. Knowledge, use and application of the ship from the principles of the theory of the ship.

2. Knowledge of the fundamental concepts of fluid mechanics and its application to the hulls of ships and artifacts, and machines, equipment and naval systems.

**Teaching methodology**

- Receive, understand and synthesize knowledge.
- Solve problems.
- Develop the reasoning and critical Thinking.
- Incorporate the gender perspective.

**Learning objectives of the subject**

Reach a good understanding of the principles of buoyancy and stability of the vessel. The student begins to calculate weight movements, stability and vessel drafts.

On the other hand, one of the objectives of this subject is provide the knowledge, understanding and proficiency of the competency "Maintain seaworthiness of the ship"(A-III/1-11), competency required and defined in Section A-III/1 of the Seafarers' Training, Certification and Watchkeeping (STCW) International Code.

This course is included in the first UPC Gender and Teaching Project whose main aim is to incorporate the gender perspective in different degree courses.
## 280644 - Ship Theory

### Study Load

<table>
<thead>
<tr>
<th></th>
<th>Hours Large Group</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Learning Time:</td>
<td>150h</td>
<td>20.00%</td>
</tr>
<tr>
<td>Hours Medium Group:</td>
<td>30h</td>
<td>20.00%</td>
</tr>
<tr>
<td>Hours Small Group:</td>
<td>15h</td>
<td>10.00%</td>
</tr>
<tr>
<td>Guided Activities:</td>
<td>0h</td>
<td>0.00%</td>
</tr>
<tr>
<td>Self Study:</td>
<td>90h</td>
<td>60.00%</td>
</tr>
</tbody>
</table>
# Content

<table>
<thead>
<tr>
<th>Chapter 1. Definitions</th>
<th>Learning time: 16h</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Theory classes: 6h</td>
</tr>
<tr>
<td></td>
<td>Self study: 10h</td>
</tr>
</tbody>
</table>

**Description:**

<table>
<thead>
<tr>
<th>Chapter 2. Approximate methods to calculate buoyancy and stability.</th>
<th>Learning time: 26h</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Practical classes: 6h</td>
</tr>
<tr>
<td></td>
<td>Guided activities: 10h</td>
</tr>
<tr>
<td></td>
<td>Self study: 10h</td>
</tr>
</tbody>
</table>

**Description:**
Calculation of areas, moments, centers of gravity, inertia and volumes. Method of trapezoids and the Simpson's first rule.

<table>
<thead>
<tr>
<th>Chapter 3. Tonnage and maximum load lines.</th>
<th>Learning time: 13h</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Theory classes: 2h</td>
</tr>
<tr>
<td></td>
<td>Practical classes: 1h</td>
</tr>
<tr>
<td></td>
<td>Self study: 10h</td>
</tr>
</tbody>
</table>

**Description:**

<table>
<thead>
<tr>
<th>Chapter 4. Drafts</th>
<th>Learning time: 14h</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Theory classes: 2h</td>
</tr>
<tr>
<td></td>
<td>Practical classes: 2h</td>
</tr>
<tr>
<td></td>
<td>Self study: 10h</td>
</tr>
</tbody>
</table>

**Description:**
Chapter 5. Centre of Gravity

**Learning time:** 14h  
Theory classes: 2h  
Practical classes: 2h  
Self study : 10h

**Description:**  
Weight movements. Using moments to find the center of gravity. TPC

Chapter 6. Center of Buoyancy

**Learning time:** 14h  
Theory classes: 2h  
Practical classes: 2h  
Self study : 10h

**Description:**  
Isocarenas and isoclines, definition. Properties of the center of buoyancy. Properties of the submerged volume curve.

Chapter 7. Initial stability

**Learning time:** 18h  
Theory classes: 6h  
Practical classes: 2h  
Self study : 10h

**Description:**  
The final score is the sum of the following partial grades:

\[ N_{\text{final}} = N_{\text{pf}} 0.4 + N_{\text{pp}} 0.4 + 0.2 N_{\text{ac}} \]

- \( N_{\text{final}} \): final score
- \( N_{\text{pf}} \): final exam
- \( N_{\text{pp}} \): partial exam
- \( N_{\text{ac}} \): continuous assessment

Partial and final exam consists of some issues associated with the learning objectives of the course so that respects the knowledge and understanding concepts, and a set of application exercises. The continuous assessment consists of different activities cumulative and formative character, both individual and group, made during the course.

Criteria for evaluating STCW A-III/1-11: The stability conditions comply with the IMO intact stability criteria under all conditions of loading. Actions to ensure and maintain the watertight integrity of the ship are in accordance with accepted practice.

The act of re-evaluation will be done through a final exam where all the course material will be assessed.
You can't pass the course if all work activities and continuous assessment are carried out and submitted. The exams average must be as minimum 4, to compute the final mark of the subject. (Systems And MUENO group)

If the student does not carried out partial and/or final exam, he or she will be considered as: Not Presented

In any case, the student can use any kind of predesigned form in controls or tests.

### Bibliography

**Basic:**


**Complementary:**


