280645 - Fluid Mechanics

Coordinator: JULIO GARCIA ESPINOSA

Degree competences to which the subject contributes

Specific:
1. Knowledge of the fundamental concepts of fluid mechanics and its application to the operation and use of naval systems.
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

- Analysis of the state of the art of the subject
- To acquire, understand and synthesize knowledge
- Setting-up and resolution of problems
- To carry works out individually and in group
- To apply computer analysis techniques

Learning objectives of the subject

- To acquire knowledge about the theory and concepts of the fluid mechanics.
- To know and be able to apply the basis of the fluid mechanics to the analysis of machinery, equipment and naval systems.
- To use the computer analysis resources to solve problems in fluid mechanics.
This course will evaluate the following STCW competences:
5. Operate fuel, lubrication, ballast and other pumping systems and associated control systems
280645 - Fluid Mechanics

### Study load

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td><strong>Total learning time:</strong> 150h</td>
<td>Hours large group: 35h</td>
<td>23.33%</td>
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<tr>
<td></td>
<td>Hours medium group: 15h</td>
<td>10.00%</td>
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<td></td>
<td>Hours small group: 0h</td>
<td>0.00%</td>
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<tr>
<td></td>
<td>Guided activities: 10h</td>
<td>6.67%</td>
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<tr>
<td></td>
<td>Self study: 90h</td>
<td>60.00%</td>
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</table>
## 280645 - Fluid Mechanics

### Content

<table>
<thead>
<tr>
<th>Topic</th>
<th>Learning time: 225h</th>
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<tbody>
<tr>
<td>Introduction to Fluid Mechanics</td>
<td>Theory classes: 40h</td>
</tr>
<tr>
<td></td>
<td>Guided activities: 50h</td>
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<tr>
<td></td>
<td>Self study: 135h</td>
</tr>
</tbody>
</table>

**Description:**

### Hydrostatics

<table>
<thead>
<tr>
<th>Learning time: 6h</th>
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<tbody>
<tr>
<td>Theory classes: 6h</td>
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</tbody>
</table>

**Description:**

### Basic equations of fluid mechanics

**Degree competences to which the content contributes:**

**Description:**

### Dimensional analysis and similarity

**Degree competences to which the content contributes:**

**Description:**
- The principle of dimensional homogeneity. The Pi theorem. Nondimensionalization of the basic equations. Reynolds number.

### Viscous flow in ducts

**Degree competences to which the content contributes:**

**Description:**
The final mark will be the weighted average of all the different evaluating activities in the subject:

\[ N_{final} = 0.70 \cdot N_{ex} + 0.15 \cdot N_{ec} + 0.15 \cdot N_{tc} \]

- \( N_{final} \): final mark
- \( N_{ex} \): average mark of the two partial exams
- \( N_{ec} \): mark of the different individual questionaries and exercises
- \( N_{tc} \): mark of the practical work in groups

The re-evaluation will consist on carrying out a written exam, including theory and practical exercises. This exam will be focused on the aspects of the matter failed by the student.

**Regulations for carrying out activities**

The student not presenting to any of the activities of the course will be qualified as "not taken".

**Bibliography**

**Basic:**

**Complementary:**