Degree competences to which the subject contributes

Specific:
- 2. Knowledge of inspection procedures and the functioning of the Classification Societies.

Transversal:
- 1. EFFICIENT ORAL AND WRITTEN COMMUNICATION - Level 2. Using strategies for preparing and giving oral presentations. Writing texts and documents whose content is coherent, well structured and free of spelling and grammatical errors.

Teaching methodology

- Lectures for theory (expository method) and laboratory sessions for practices (demonstration method).
- Use of ICT and teaching support platform ATENEA.

Learning objectives of the subject

On the other hand, one of the objectives of this subject is provide the knowledge, understanding and proficiency of the competency ?NAME OF THE COMPETENCY STCW ATTACHED TABLE OF SUBJECTS?, competency required and defined in Section A-III/1 Mandatory minimum requirements for certification of officers in charge of an engineering watch in a manned engine-room or designated duty engineer in a periodically unmanned engine-room (propulsion power of 750 kW or more) of the Seafarers? Training, Certification and Watchkeeping (STCW) International Code.
## Study load

<table>
<thead>
<tr>
<th>Total learning time: 112h 30m</th>
<th>Hours large group:</th>
<th>25h</th>
<th>22.22%</th>
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<tbody>
<tr>
<td>Hours medium group:</td>
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<td></td>
<td>0.00%</td>
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<tr>
<td>Hours small group:</td>
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<td>Guided activities:</td>
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<tr>
<td>Self study:</td>
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<td>60.00%</td>
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## Content

<table>
<thead>
<tr>
<th>(ENG) PENETRANT TESTING</th>
<th><strong>Learning time:</strong> 2h</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Theory classes: 2h</td>
</tr>
</tbody>
</table>

### Description:

**THEORY PROGRAM:**

- Introduction to the terminology, purpose and history of the end.
- Physical principles of the method and associated knowledge.
- Security and environmental conditions.
- Knowledge about the product and capacity of the method and its derivative techniques.
- Team.
- Information previous to the test.
- Valuation.
- Essays.
- Evaluation and report.
- Innovations.
- Quality aspects.

**PROGRAM OF LABORATORY PRACTICES:**

- Identification of defects in parts and test specimens with real and artificial discontinuities; macrographs.
- Selection of suitable materials for an assay.
- Management of: aerosols; thermometers; white light meters; black light intensity meters; use of UV-A light; standard blocks and comparators.
- Writing written instructions: exercises.
- Test with visible penetrant liquids removable with water (Method A, Type II).
- Test with visible penetrant liquids removable with solvent (Method C, Type II).
- Test with fluorescent penetrating liquids removable with water (Method A, Type I).
- Test with solvent-removable fluorescent penetrant liquids (Method C, Type I).
- Test with post-emulsifiable fluorescent penetrant liquids (Method D, Type I).
- Evaluation of discontinuities according to acceptance or rejection criteria.
- Writing the test report. Formats.
- Management and application of applicable regulations.

Note: The agenda includes the contents of ISO / TR 25107: 2006.

### Related activities:

- Delivery of the study activities associated with the subject and carrying out the corresponding tests.
- Delivery of the report of the laboratory practice (s) corresponding to the type and test technique carried out.

### Specific objectives:

- Select the ideal method and technique.
- Get your own indication.
- Interpret and evaluate said indication.
- Report the results of the trial.
(ENG) MAGNETIC PARTICLE TESTING

**Description:**
THEORY PROGRAM:
- INTRODUCTION TO THE TERMINOLOGY, HISTORY OF THE END.
- PHYSICAL PRINCIPLES OF THE METHOD AND ASSOCIATED KNOWLEDGE
- KNOWLEDGE ABOUT THE PRODUCT AND CAPACITY OF THE METHOD AND ITS DERIVATIVE TECHNIQUES.
- TEAM
- INFORMATION PREVIOUS TO THE TEST.
- TEST.
- EVALUATION AND REPORT.
- VALUATION.
- ASPECTS ON QUALITY.
- SECURITY AND ENVIRONMENTAL CONDITIONS
- PROGRESS

LABORATORY PRACTICES:
- VISUALIZATION OF THE MAGNETIC FIELD CREATED BY A PERMANENT MAGNET.
- CONTACT WITH DIFFERENT TYPES AND COLORATIONS OF PARTICLES.
- PREPARATION OF HUMID PARTICLE BATHS AND USE OF THE CENTRIFUGAL TUBE.
- USE AND REMOVAL OF THE CONTRAST LACQUER
- DESCRIPTION AND HANDLING OF YUGOS OF CONTINUOUS AND ALTERNATE CURRENT.
- CALCULATION OF MAGNETIZATION CURRENTS FOR DIFFERENT TECHNIQUES.
- UTILIZATION OF THE BERTHOL CROSS.
- USE OF THE KETOS RING
- USE OF RESIDUAL MAGNETIC FIELD METERS
- MAGNETIZATION THROUGH COIL.
- MAGNETIZATION THROUGH POINT OF CONTACT.
- MAGNETIZATION THROUGH FIXED BED.
- DEMAGNETIZATION PROCESSES
- EMPLOYMENT OF BLACK LIGHT.
- MEASUREMENTS OF TEMPERATURE AND LIGHTING.
- EXAMINATION OF DIFFERENT PROBES USING DIFFERENT TEST TECHNIQUES.
- ACCEPTANCE CRITERIA ACCORDING TO DIFFERENT REGULATIONS.
- ELABORATION OF TEST REPORTS.
- ELABORATION OF TECHNICAL INSTRUCTIONS

Note: The agenda includes the contents of ISO / TR 25107: 2006:

**Related activities:**
- Delivery of the study activities associated with the subject and carrying out the corresponding tests.
- Delivery of the report of the laboratory practice (s) corresponding to the type and technique of the test carried out

**Specific objectives:**
- Select the ideal method and technique.
- Get your own indication.
- Interpret and evaluate said indication.
- Report the results of the trial.
(ENG) ULTRASONIC TESTING

Learning time: 1h
Theory classes: 1h

Description:
THEORY PROGRAM:
- INTRODUCTION, OBJECT AND HISTORY OF ULTRASOUND-PHYSICAL PRINCIPLES
- ULTRASOUND INSPECTION TECHNIQUE
- EQUIPMENT AND ACCESSORIES
- DEFECTOLOGY
- TECHNICALS OF TEST AND EVALUATION OF THE INDICATIONS-
  REFERENCE DOCUMENTS AND REPORTS-EVALUATION AND WELDING REPORTS
- QUALITY ASPECTS

PROGRAM OF LABORATORY PRACTICES:
- Documentary support: Procedures; rules; Reports and preparation written instructions.
- Verification of the equipment s / 12668-3. Calibration blocks.
- Calibration and adjustment operations: V1, V2, etc.
- Practices with normal probe.
- Practices with angle probe
- Practices with bicrystal probe.
- Exploration of type test tubes.
- Detection, location and sizing techniques. Exercises.

Related activities:
- Delivery of the study activities associated with the subject and carrying out the corresponding tests.
- Delivery of the report of the laboratory practice (s) corresponding to the type and test technique carried out.

Specific objectives:
- Select the ideal method and technique.
- Get your own indication.
- Interpret and evaluate said indication.
- Report the results of the trial.
The final grade is the sum of the following grades:

\[ N_{\text{final}} = 0.50 \times N_{\text{p, Theory}} + 0.50 \times N_{\text{p, Practices Lab}} \]

- **Nfinal**: final grade.
- **Nparcial Theory**: qualification of theory tests (tests).
- **Nparcial Lab. Practices**: qualification of laboratory practices.

### Qualification system

The final grade is the sum of the following grades:

**Learning time:** 1h

- Theory classes: 1h

### Regulations for carrying out activities

- If you do not do any of the activities of laboratory or continuous evaluation, it will be considered as unrated.
- Those students who are in the conditions established by the Center to be able to present themselves to the re-evaluation exam, will have to present only of the suspended part.
- Note: The student will be assigned to a group of laboratory practices at the time of enrollment and no changes will be allowed during the course. Only in exceptional cases will the responsible professor assign the groups.
Bibliography

Basic:


Others resources:

- penetrating dye
- electromagnetic yoke
- equipment of tips and coil
- Thermographic camera
- UV light
- microscopes