280726 - Maintenance Engineering and Management

Coordinating unit: 280 - FNB - Barcelona School of Nautical Studies
Teaching unit: 742 - CEN - Department of Nautical Sciences and Engineering
Academic year: 2020
Degree: MASTER'S DEGREE IN THE MANAGEMENT AND OPERATION OF MARINE ENERGY FACILITIES (Syllabus 2016). (Teaching unit Compulsory)
ECTS credits: 5

Teaching languages: Catalan, Spanish

Opening hours

Timetable: Students are informed at the beginning of the semester once schedules have been set

Degree competences to which the subject contributes

Basic:
CB6. Possess knowledge and understanding that provide a basis or opportunity to be original in the development and / or application of ideas, often in a research context.
CB7. That the students can apply their knowledge and ability to solve problems in new or unfamiliar environments within broader (or multidisciplinary) contexts related to their study area.
CB8. Students should be able to integrate knowledge and handle the complexity of making judgments based on information that, being incomplete or limited, includes reflections on the responsibilities social and ethical linked to the application of their knowledge and judgments.

Specific:
CE5-MGOIEM. Capacitat per conèixer, entendre i utilitzar els principis d'inspecció i certificació d'instal·lacions marines

Students should be able to integrate knowledge and handle the complexity of making judgments based on information that, being incomplete or limited, includes reflections on the responsibilities social and ethical linked to the application of their knowledge and judgments.

CB9. That students can communicate their conclusions and the knowledge and Latest rationale underpinning to specialists and non-Specialty clearly and unambiguously
CB10. Students must possess the learning skills that enable them continue studying in a way that will be largely self-directed or autonomous.

Universitat Politècnica de Catalunya
CE7-MGOIEM. Capacitat per conèixer, entendre i utilitzar els principis de control avançat de processos d'operació, manteniment i reparació
CE13MGOIEM. Coneixement i capacitat per projectar operacions de manteniment de sistemes de màquines i motors tèrmics i hidràulics i màquines elecètriques marines

Generical:

CG1-MGOIEM. Conocimientos suficientes en materias básicas y tecnológicas, que le capaciten para el desarrollo de nuevos métodos y procedimientos
CG2-MGOIEM. (ENG) Capacidad para resolver problemas complejos y tomar decisiones con responsabilidad sobre bases científicas y tecnológicas en el ámbito de su especialidad
CG4-MGOIEM. (ENG) Capacidad para gestionar, optimizar y controlar los procesos de operación, reparación, rediseño, conversión, mantenimiento e inspección de las instalaciones anteriores
CG5-MGOIEM. (ENG) Capacidad de integración de sistemas maritimos complejos y de traducción en soluciones viables

CG6-MGOIEM. (ENG) Capacidad para desarrollar los conocimientos para el análisis e interpretación de mediciones, cálculos, valoraciones, tasaciones, peritaciones, estudios, informes y documentos técnicos en el ámbito de su especialidad
CG10MGOIEM. Capacitat per re-disseny i modificació d'equips i instal·lacions energètiques i de seguretat marines, dins l'àmbit de la seva especialitat, és a dir, operació, manteniment i explotació
CG11MGOIEM. Capacitat per realitzar tasques d'investigació, desenvolupament i innovació en l'àmbit de la seva especialitat
CG9-MGOIEM. Capacitat per a la gestió de l'explotació i operació de vaixells i artefactes marítimes, la seva seguretat, prevenció de la contaminació i riscos laborals, salvament i rescats, suport logístic i manteniment

Transversal:

CT2. SUSTAINABILITY AND SOCIAL COMMITMENT: Being aware of and understanding the complexity of the economic and social phenomena typical of a welfare society, and being able to relate social welfare to globalisation and sustainability and to use technique, technology, economics and sustainability in a balanced and compatible manner.
CT3. TEAMWORK: Being able to work in an interdisciplinary team, whether as a member or as a leader, with the aim of contributing to projects pragmatically and responsibly and making commitments in view of the resources that are available.
CT4. EFFECTIVE USE OF INFORMATION RESOURCES: Managing the acquisition, structuring, analysis and display of data and information in the chosen area of specialisation and critically assessing the results obtained.
CT5. FOREIGN LANGUAGE: Achieving a level of spoken and written proficiency in a foreign language, preferably English, that meets the needs of the profession and the labour market.
CT1. ENTREPRENEURSHIP AND INNOVATION: Knowing and understanding the organization of a company and the sciences that govern the activity; be able to understand the business rules and relationships between planning, industrial and commercial strategies, quality and profit.

Know and understand the mechanisms that scientific research is based, as well as the mechanisms and instruments of transfer of results between different socio-economic actors involved in the processes of R + D + i.

Learning objectives of the subject

Competences STCW:
4. Manage fuel, lubrication and ballast operations
4.1. Operation and maintenance of machinery, including pumps and piping systems
7. Manage safe and effective maintenance and repair procedures
7.1. Marine engineering practice
Practical knowledge
7.2. Manage safe and effective maintenance and repair procedures
7.3. Planning maintenance, including statutory and class verifications
7.4. Planning repairs
8. Detect and identify the cause of machinery malfunctions and correct faults
8.1. Detection of machinery malfunction, location of faults and action to prevent damage
8.2. Inspection and adjustment of equipment
8.3. Non-destructive examination

Study load

| Total learning time: 45h | Hours large group: | 45h | 100.00% |
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<th>Organization of maintenance work</th>
<th><strong>Learning time:</strong> 26h 18m</th>
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<tbody>
<tr>
<td><strong>Description:</strong></td>
<td>Theory classes: 1h 18m</td>
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<tr>
<td>Organization of safe maintenance and repair procedures.</td>
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<td>Maintenance planning, including mandatory and class reviews.</td>
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<td>Planning of the repairs of the different systems and equipment of the ship.</td>
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<td><strong>Specific objectives:</strong></td>
<td>Self study: 25h</td>
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<tr>
<td>Maintenance planning and its activities</td>
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<td>Tests, non-destructive tests, inspections and equipment adjustments</td>
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<th>46/ 5000 Methods of analysis applied to maintenance</th>
<th><strong>Learning time:</strong> 26h 12m</th>
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<tr>
<td><strong>Description:</strong></td>
<td>Theory classes: 1h 12m</td>
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<tr>
<td>199/5000</td>
<td>Practical classes: 25h</td>
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<td>Analysis methods.</td>
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<td>Detection of malfunctions of the machines, location of faults and measures to prevent them.</td>
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<tr>
<td>Inspection and adjustment of equipment.</td>
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<td>Non-destructive testing and testing.</td>
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<tr>
<td><strong>Specific objectives:</strong></td>
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<tr>
<td>Materials technology operation, monitoring, performance evaluation and effective maintenance of on-board systems and equipment</td>
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<tr>
<td>Detection of malfunctions, fault location and means to prevent breakdowns</td>
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<tr>
<td>8. Detect and identify the cause of machinery malfunctions and correct faults</td>
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<tr>
<td>Practical knowledge</td>
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<tr>
<td>8.1. Detection of machinery malfunction, location of faults and action to prevent damage</td>
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<td>8.2. Inspection and adjustment of equipment</td>
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<td>8.3. Non-destructive examination</td>
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### Total Productive Maintenance

**Description:**
- Generalities of the total productive maintenance.
- Objectives of the total productive maintenance.
- Implementation of total productive maintenance.

**Specific objectives:**
- Productive maintenance

**Learning time:** 16h 30m
- Theory classes: 1h 30m
- Self study : 15h

### 36/5000 Computer Aided Maintenance

**Description:**
- Development and implementation
- Choice of a computer application for maintenance management.
- Basic structure of a computer application for maintenance management.

**Specific objectives:**
- Computer assisted maintenance

**Learning time:** 16h
- Theory classes: 15h
- Practical classes: 1h

### Maintenance Audits

**Description:**
- Organizational chart of maintenance management.
- Objectives of maintenance audits.
- Types of maintenance audits.
- Conducting maintenance audits.

**Specific objectives:**
- Organization chart of maintenance management
- Maintenance audits
- Analysis and control of maintenance costs

**Learning time:** 21h 06m
- Theory classes: 1h 06m
- Self study : 20h
It will be evaluated with three tests
First test 30%
40% work
Final test 30%

**Contracted Maintenance**

<table>
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<th>Learning time:</th>
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<tr>
<td>Theory classes:</td>
<td>1h 24m</td>
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<tr>
<td>Practical classes:</td>
<td>16h</td>
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**Description:**
- General considerations.
- Causes of hiring in maintenance.
- Types of maintenance contracts.
- Structure of maintenance contracts.

**Specific objectives:**
- Maintenance contracts
  - 7. Manage safe and effective maintenance and repair procedures
  - 7.2. Manage safe and effective maintenance and repair procedures
  - 7.3. Planning maintenance, including statutory and class verifications
  - 7.4. Planning repairs

**Qualification system**
Bibliography

Basic:


Others resources:

Hyperlink
www.plant-maintenance.com

www.solomantenimiento.com

www.aem.es
Resource

Audiovisual material
Nom recurs
Resource