



## Teaching Guide

| Teaching Guide         |                                                                                                                                                                                                                                                                      |              |          |           |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|----------|-----------|
| Identifying Data       |                                                                                                                                                                                                                                                                      |              |          | 2018/19   |
| Subject (*)            | Resistencia ao Avance e Propulsión                                                                                                                                                                                                                                   |              | Code     | 631311601 |
| Study programme        | Licenciado en Máquinas Navais                                                                                                                                                                                                                                        |              |          |           |
| Descriptors            |                                                                                                                                                                                                                                                                      |              |          |           |
| Cycle                  | Period                                                                                                                                                                                                                                                               | Year         | Type     | Credits   |
| First and Second Cycle | Yearly                                                                                                                                                                                                                                                               | First Second | Optional | 5         |
| Language               | Spanish                                                                                                                                                                                                                                                              |              |          |           |
| Teaching method        | Face-to-face                                                                                                                                                                                                                                                         |              |          |           |
| Prerequisites          |                                                                                                                                                                                                                                                                      |              |          |           |
| Department             | Enxeñaría Naval e Industrial                                                                                                                                                                                                                                         |              |          |           |
| Coordinador            |                                                                                                                                                                                                                                                                      | E-mail       |          |           |
| Lecturers              |                                                                                                                                                                                                                                                                      | E-mail       |          |           |
| Web                    |                                                                                                                                                                                                                                                                      |              |          |           |
| General description    | Comprender y manejar el concepto de resistencia al avance y los elementos o causas que intervienen en su generación.<br>Comprender la dinámica de la auto-propulsión,y de la interacción Propulsor-Vehículo.<br>Comprender la metodología de predicción de potencia. |              |          |           |

## Study programme competences

|      |                             |
|------|-----------------------------|
| Code | Study programme competences |
|------|-----------------------------|

## Learning outcomes

|                   |                             |
|-------------------|-----------------------------|
| Learning outcomes | Study programme competences |
|-------------------|-----------------------------|

## Contents

| Topic                   | Sub-topic                                                                                                                                                                                                                                                                                                                                                                |
|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.Hidrodinámica Náutica | 1.1.Introducción.<br>1.2.Ecuaciones generales de la hidrodinámica.<br>1.3.Hidrodinámica Potencial.<br>1.4.Circulación y Sustentación.<br>1.5.Análisis Dimensional.<br>1.5.Régimenes de Flujo.<br>1.6.Teoría de la Capa Límite.<br>1.7.Análisis de Flujos Externos: Condiciones de Contorno.<br>1.8.Idea básica sobre los métodos de la Hidrodinámica Computacional.      |
| 2.Resistencia al Avance | 2.1.Componentes de la Resistencia al avance.<br>2.2.Resistencia Friccional y de Formas.<br>2.3.Resistencia por Formación de Olas.<br>2.4.Resistencia Aerodinámica.<br>2.5.Efecto de los Apéndices en la Resistencia.<br>2.6.Ensayos con Modelos y correlación Modelo-Buque.<br>2.7.Influencia de las Formas en la resistencia.<br>2.8.Métodos de predicción de Potencia- |



|              |                                                                                                                                                                                                                                     |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3.Propulsión | 3.1.Generalidades<br>3.2.Dinámica de la Propulsión.<br>3.3.Análisis del Propulsor Aislado.<br>3.4.Análisis de la interacción Propulsor-Vehículo.<br>3.4.Régimenes de Carga y Cavitación.<br>3.5.Series sistemáticas de Propulsores. |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| Planning                                                                                                                        |              |                      |                               |             |
|---------------------------------------------------------------------------------------------------------------------------------|--------------|----------------------|-------------------------------|-------------|
| Methodologies / tests                                                                                                           | Competencies | Ordinary class hours | Student's personal work hours | Total hours |
| Guest lecture / keynote speech                                                                                                  |              | 55                   | 0                             | 55          |
| Workbook                                                                                                                        |              | 0                    | 10                            | 10          |
| Supervised projects                                                                                                             |              | 5                    | 0                             | 5           |
| Problem solving                                                                                                                 |              | 50                   | 0                             | 50          |
| Personalized attention                                                                                                          |              | 5                    | 0                             | 5           |
| (*)The information in the planning table is for guidance only and does not take into account the heterogeneity of the students. |              |                      |                               |             |

| Methodologies                  |                                                                                            |
|--------------------------------|--------------------------------------------------------------------------------------------|
| Methodologies                  | Description                                                                                |
| Guest lecture / keynote speech | Desarrollo de los contenidos de la asignatura                                              |
| Workbook                       | Manejo de bibliografía complementaria: como artículos publicados , informes técnicos, etc. |
| Supervised projects            | Elaboración personal de información complementaria.                                        |
| Problem solving                | Planteamiento y solución de problemas.                                                     |

| Personalized attention |                                     |
|------------------------|-------------------------------------|
| Methodologies          | Description                         |
| Supervised projects    | Supervisión del trabajo del alumno. |
| Workbook               |                                     |

| Assessment                     |              |                                                                |               |
|--------------------------------|--------------|----------------------------------------------------------------|---------------|
| Methodologies                  | Competencies | Description                                                    | Qualification |
| Supervised projects            |              | Exposición del Trabajo.<br>Contenidos.<br>Aportación Personal. | 10            |
| Workbook                       |              | Comprensión del contenido                                      | 10            |
| Guest lecture / keynote speech |              | Prueba escrita                                                 | 50            |
| Problem solving                |              | Prueba escrita                                                 | 30            |
| Others                         |              |                                                                |               |

| Assessment comments |
|---------------------|
|                     |

| Sources of information |                                                                                                                                                                                               |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Basic                  | - Breslin, John (1994). Hydrodynamics of Ship Propellers. C.U.P.<br>- Carlton, (1994). Marine Propellers and Propulsion. B.H.<br>- Bertram, Volker (2000). Practical Ship Hydrodynamics. B.H. |
| Complementary          |                                                                                                                                                                                               |



| Recommendations                                          |
|----------------------------------------------------------|
| Subjects that it is recommended to have taken before     |
|                                                          |
| Subjects that are recommended to be taken simultaneously |
|                                                          |
| Subjects that continue the syllabus                      |
|                                                          |
| Other comments                                           |
|                                                          |

(\*)The teaching guide is the document in which the URV publishes the information about all its courses. It is a public document and cannot be modified. Only in exceptional cases can it be revised by the competent agent or duly revised so that it is in line with current legislation.