



Course guide

280664 - 280664 - Mechanics for Naval Engineering

Last modified: 25/10/2023

Unit in charge: Barcelona School of Nautical Studies
Teaching unit: 742 - CEN - Department of Nautical Sciences and Engineering.

Degree: BACHELOR'S DEGREE IN NAVAL SYSTEMS AND TECHNOLOGY ENGINEERING (Syllabus 2010). (Compulsory subject).

Academic year: 2023 **ECTS Credits:** 7.5 **Languages:** Spanish

LECTURER

Coordinating lecturer: JAVIER MARTINEZ GARCIA

Others: Primer quadrimestre:
JAVIER MARTINEZ GARCIA - DT, GESTN, MUENO
FERMÍN ENRIQUE OTERO GRUER - DT, GESTN, MUENO

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:

1. Knowledge of mechanics and machine components.
2. Knowledge of the elasticity and strength of materials and ability to perform calculations of elements for various solicitations.

Transversal:

3. SELF-DIRECTED LEARNING - Level 1. Completing set tasks within established deadlines. Working with recommended information sources according to the guidelines set by lecturers.

TEACHING METHODOLOGY

Adquirir, comprendre i sintetitzar coneixements
Platejar i resoldre problemes
Realitzar treballs individualment
Analitzar resultats
Relacionar coneixements de disciplines diferents

LEARNING OBJECTIVES OF THE SUBJECT

Coneix els fonaments i conceptes de la mecànica i dels components de màquines.
Comprèn els conceptes d'elasticitat i resistència de materials.
Identifica, modela i planteja problemes a partir de situacions obertes. Explora i aplica les alternatives per a la seva resolució. Maneja aproximacions, compromisos i prioritats

STUDY LOAD

Type	Hours	Percentage
Hours medium group	46,0	24.53
Self study	112,5	60.00
Hours large group	29,0	15.47

Total learning time: 187.5 h



CONTENTS

(ENG) Geometria de Masses.

Full-or-part-time: 12h

Theory classes: 2h

Practical classes: 3h

Self study : 7h

(ENG) Cinemàtica del Punt i del Sòlid.

Full-or-part-time: 7h

Theory classes: 2h

Practical classes: 1h

Self study : 4h

(ENG) Estudi de Mecanismes.

Full-or-part-time: 12h

Theory classes: 2h

Practical classes: 3h

Self study : 7h

(ENG) Velocitats en Mecanismes Plans.

Full-or-part-time: 19h

Theory classes: 3h

Practical classes: 5h

Self study : 11h

(ENG) Acceleracions en Mecanismes Plans.

Full-or-part-time: 19h

Theory classes: 2h

Practical classes: 4h

Self study : 13h

(ENG) Dinàmica del Moviment Pla.

Full-or-part-time: 14h

Theory classes: 2h

Practical classes: 3h

Self study : 9h



(ENG) Forces d'Inèrcia del Moviment Pla.

Full-or-part-time: 13h

Theory classes: 2h

Practical classes: 3h

Self study : 8h

(ENG) Equilibri de Rotors.

Full-or-part-time: 9h

Theory classes: 2h

Practical classes: 2h

Self study : 5h

(ENG) Dinàmica dels Sistemes d'un Grau de Llibertat.

Full-or-part-time: 13h 30m

Theory classes: 2h

Practical classes: 3h

Self study : 8h 30m

(ENG) Equilibri del Punt.

Full-or-part-time: 16h

Theory classes: 2h

Practical classes: 4h

Self study : 10h

(ENG) Equilibri del Sòlid.

Full-or-part-time: 25h

Theory classes: 4h

Practical classes: 6h

Self study : 15h

(ENG) Esforços al Sòlid.

Full-or-part-time: 28h

Theory classes: 4h

Practical classes: 9h

Self study : 15h

GRADING SYSTEM

The final mark obtained for the course will be calculated with the following formula:

$$N_{\text{final}} = 0.20 \cdot N_{\text{ae}} + 0.20 \cdot N_{\text{pp}} + 0.60 \cdot N_{\text{pf}}$$

N_{final} : Final course mark

N_{ae} : Qualification for class attendance and class assignments

N_{pp} : Qualification obtained from the mid-term exam

N_{pf} : Qualification obtained from the final exam

The mid-term mark will be obtained from two different exams that will take place in class hours.

RE-EVALUATION

The re-evaluation exam consists on a single exam that will include all the course syllabus. The final mark obtained in the subject, and the re-evaluation, will be the mark obtained in this exam. This mark will be always equal or higher than the course mark previously obtained, and cannot be higher than 5.

EXAMINATION RULES.

The student that does not attend to the final exam will obtain a "abandoned" as the final mark for the course.

Students are allowed to bring a maximum of 5 pages with formulae to the exams.

BIBLIOGRAPHY

Basic:

- Riley, W.F.; Sturges, L.D. Ingeniería Mecánica. Vol. 1, Estática. Barcelona: Reverté, 1995. ISBN 842914255X.
- Riley, W.F.; Sturges, L.D. Ingeniería Mecánica. Vol. 2, Dinámica. Barcelona: Reverté, 1995. ISBN 8429142568 (V.2).
- Riba i Romeva, Carles. Mecanismes i màquines [on line]. 3a ed. Barcelona: Edicions UPC, 2002 [Consultation: 01/05/2012]. Available on: <https://upcommons.upc.edu/handle/2099.3/36254>. ISBN 8483013525.
- Hernández, A. Cinemática de mecanismos: análisis y diseño. Madrid: Síntesis, 2004. ISBN 8497562240.
- Gere, James M. Resistencia de materiales. 5a ed. Madrid: International Thomson, 2002. ISBN 9788497320658.

Complementary:

- Garcés, Marina. Escola d'aprenents. Primera edició. Barcelona: Galàxia Gutenberg, novembre de 2020. ISBN 9788418218422.
- Beer, Ferdinand P. ; Johnston, Russel E. ; Mazurek, David F. Mecánica vectorial para ingenieros. Vol. 1, Estática [on line]. 12a ed. México: McGraw-Hill Education, 2021 [Consultation: 01/03/2023]. Available on: https://www-ingebook-com.recursos.biblioteca.upc.edu/ib/NPcd/IB_BooksVis?cod_primaria=1000187&codigo_libro=11980. ISBN 9781456289782.
- Beer, Ferdinand P.; Johnston, Russel E.; Cornwell, Phillip J. ; Self, Brian P. Mecánica vectorial para ingenieros. Vol. 2, Dinámica [on line]. 12a ed. México: McGraw-Hill Education, 2021 [Consultation: 01/03/2023]. Available on: https://www-ingebook-com.recursos.biblioteca.upc.edu/ib/NPcd/IB_BooksVis?cod_primaria=1000187&codigo_libro=11979. ISBN 9781456289775.
- Meriam, J. L. Mecánica para ingenieros. Vol. 1, Estática [on line]. 3a ed. Barcelona: Reverté, 1999 [Consultation: 01/03/2023]. Available on: https://www-ingebook-com.recursos.biblioteca.upc.edu/ib/NPcd/IB_BooksVis?cod_primaria=1000187&codigo_libro=7723. ISBN 8429142576.
- Meriam, J. L. Mecánica para ingenieros. Vol. 2, Dinámica [on line]. 3a ed. Barcelona: Reverté, 1999 [Consultation: 01/03/2023]. Available on: https://www-ingebook-com.recursos.biblioteca.upc.edu/ib/NPcd/IB_BooksVis?cod_primaria=1000187&codigo_libro=7722. ISBN 8429142592.
- Vázquez, M.; López, E. Mecánica para ingenieros. 7a ed. Madrid: Noela, 1998. ISBN 8488012039.
- Vázquez Fernández, Manuel. Resistencia de materiales. 4a ed. Madrid: Noela, 1999. ISBN 8488012055.
- Calero Pérez, Roque; Carta González, José Antonio. Fundamentos de mecanismos y máquinas para ingenieros. Madrid: McGraw-Hill, 1999. ISBN 844812099X.
- Cardona Foix, S.; Clos Costa, D. Teoría de máquinas [on line]. Barcelona: Edicions UPC, 2008 [Consultation: 01/03/2023]. Available on: <http://hdl.handle.net/2099.3/36644>. ISBN 9788469708613.
- Nieto Nieto, Justo. Síntesis de mecanismos. Madrid: AC, 1978. ISBN 8472880257.



- Cervera, M.; Blanco, E. Mecánica de estructuras. Vol. 1, Resistencia de materiales [on line]. 2a ed. Barcelona: Edicions UPC, 2002 [Consultation: 05/07/2022]. Available on: <http://hdl.handle.net/2099.3/36196>. ISBN 8483016230.