

## 340050 - TEMA-M5012 - Machine Theory

|                    |   |                     |         |
|--------------------|---|---------------------|---------|
| Coordinating unit: | 340 - EPSEVG - Vilanova i la Geltrú School of Engineering   |                     |         |
| Teaching unit:     | 712 - EM - Department of Mechanical Engineering   |                     |         |
| Academic year:     | 2019  |                     |         |
| Degree:            | BACHELOR'S DEGREE IN MECHANICAL ENGINEERING (Syllabus 2009). (Teaching unit Compulsory)<br>BACHELOR'S DEGREE IN ELECTRICAL ENGINEERING (Syllabus 2009). (Teaching unit Optional)<br>BACHELOR'S DEGREE IN INDUSTRIAL ELECTRONICS AND AUTOMATIC CONTROL ENGINEERING (Syllabus 2009). (Teaching unit Optional) |                     |         |
| ECTS credits:      | 6   | Teaching languages: | Catalan |

### Teaching staff

|              |   |
|--------------|---|
| Coordinator: | JUAN SOLE ROVIRA                          |
| Others:      | JUAN SOLE ROVIRA - AMELIA NÁPOLES ALBERRO |

### Degree competences to which the subject contributes

#### Specific:

- 3. CE13. Knowledge of theatrical basics of machines and mechanisms

#### Transversal:

- 2. SELF-DIRECTED LEARNING - Level 3. Applying the knowledge gained in completing a task according to its relevance and importance. Deciding how to carry out a task, the amount of time to be devoted to it and the most suitable information sources.

### Teaching methodology

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### Learning objectives of the subject

When finishing the subject the student has to be able of:

- Analyze and relate the solicitations of a mechanical system with its motion.
- Identify and analyze problems of mechanical vibration.

### Study load

|                           |                     |         |        |
|---------------------------|---------------------|---------|--------|
| Total learning time: 150h | Hours large group:  | 52h 30m | 35.00% |
|                           | Hours medium group: | 0h      | 0.00%  |
|                           | Hours small group:  | 7h 30m  | 5.00%  |
|                           | Guided activities:  | 0h      | 0.00%  |
|                           | Self study:         | 90h     | 60.00% |

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### Content

|                                     |   |
|-------------------------------------|---|
| (ENG) 1 - Cinemàtica de mecanismes  | Learning time: 36h<br>Theory classes: 11h 15m<br>Laboratory classes: 3h 45m<br>Self study : 21h |
| (ENG) 2 - Dinàmica de mecanismes    | Learning time: 36h<br>Theory classes: 11h 15m<br>Laboratory classes: 3h 45m<br>Self study : 21h |
| (ENG) 3 - Dinàmica de mecanismes    | Learning time: 36h<br>Theory classes: 11h 15m<br>Laboratory classes: 3h 45m<br>Self study : 21h |
| (ENG) 4 - Vibracions mecàniques     | Learning time: 36h<br>Theory classes: 11h 15m<br>Laboratory classes: 3h 45m<br>Self study : 21h |
| (ENG) Proves d'avaluació individual | Learning time: 6h<br>Guided activities: 6h  |
| Description:<br>Written exams.      |   |

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### Planning of activities

|  |                                   |
|--|-----------------------------------|
| A1. EVALUATION OF THE LEARNING PROCESS | Hours: 40h<br>Theory classes: 40h |
| A2. EVALUATION FOR ACCREDITATION       | Hours: 4h<br>Theory classes: 4h   |

### Qualification system

The training activities of knowledge acquisition and related to the control of the learning process of the student will be evaluated with the support of the platform SoRAP and will assume 9% of the final grade of the subject. The assessment evaluation activities will be solved in two evaluation acts that will be planned by the School within the periods of partial evaluation and final evaluation, respectively. These accrediting evaluation activities will take the form of written exercises, their results will correspond to 91% of the final grade of the subject and will be reevaluable (during the reevaluation period) according to what is specified in the academic regulations of the Degree studies.

### Bibliography

#### Basic:

Ramón Moliner, Pedro. Vibraciones. Barcelona: el autor, 1980. ISBN 8430025987.

Cardona i Foix, Salvador. Teoría de máquinas [on line]. 2a ed. Barcelona: Edicions UPC, 2008 [Consultation: 27/01/2015]. Available on: <<http://hdl.handle.net/2099.3/36644>>. ISBN 9788483019634.

Ramon Moliner, Pedro. Dinámica de las máquinas. 1a ed. Barcelona: CPDA. ETSEIB, 1978.

#### Complementary:

Agulló i Batlle, Joaquim. Mecànica de la partícula i del sòlid rígid. 3a ed. Barcelona: OK Punt, 2002. ISBN 8492085061.

Beer, Ferdinand Pierre. Mecánica vectorial para ingenieros. Vol. 2, Dinámica [on line]. 11a ed. México: McGraw-Hill Education, 2017 [Consultation: 31/07/2019]. Available on: <[https://discovery.upc.edu/iii/encore/record/C\\_\\_Rb1516244?lang=cat](https://discovery.upc.edu/iii/encore/record/C__Rb1516244?lang=cat)>. ISBN 9781456255268.

Riley, William F.; Sturges, Leroy D. Ingeniería mecánica. Vol. 2, Dinámica. Barcelona [etc.]: Reverté, 2005. ISBN 8429142568.

Khamashta, Munir; Álvarez, Lorenzo; Capdevila, Ramón. Problemas de cinemática y dinámica de máquinas. Barcelona: Edicions de la Universitat Politècnica de Catalunya, 1986. ISBN 8476530048.