

SUBJECT TEACHING GUIDE

M870 - Experimental Methods in Mechanical Engineering

Master's Degree in Industrial Engineering Research

Academic year 2021-2022

| 1. IDENTIFYING DATA | | | | | |
|----------------------------------|--|------------------|--------------------|------------------|--------------|
| Degree | Master's Degree in Industrial Engineering Research | | Type and Year | Optional. Year 1 | |
| Faculty | School of Industrial Engineering and Telecommunications | | | | |
| Discipline | Module - Sustainable Design in Industrial Systems Electromechanic / Mechatronics Module Advanced Techniques in Mechanical Design | | | | |
| Course unit title and code | M870 - Experimental Methods in Mechanical Engineering | | | | |
| Number of ECTS credits allocated | 5 | Term | Semester based (2) | | |
| Web | | | | | |
| Language of instruction | Spanish | English Friendly | Yes | Mode of delivery | Face-to-face |

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|------------------|--|--|--|--|
| Department | DPTO. INGENIERIA ESTRUCTURAL Y MECANICA | | | |
| Name of lecturer | RAMON SANCIBRIAN HERRERA | | | |
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| Other lecturers | | | | |

3.1 LEARNING OUTCOMES

- Get knowledge of existing instrumentation and tests currently in the dynamic design of systems and components.
Being able to face practical problems in research in the design of systems and components.
- Being able to design dynamic testing in the investigation of dynamic behavior of machines.
- Innovate in product design tools with existing mechanical analysis.

4. OBJECTIVES

Provide knowledge of existing instrumentation and tests currently in the dynamic design of systems and components.
 Provide the necessary knowledge for the student to be able to face practical problems in research in the design of systems and components.
 Provide the student the ability to pose dynamic tests in the investigation of dynamic behavior of machines.
 Provide the necessary knowledge for the student to be able to innovate in product design tools with existing mechanical analysis.

6. COURSE ORGANIZATION

| CONTENTS | |
|----------|--|
| 1 | Introduction |
| 2 | Vibration isolation |
| 3 | 2 dof and N dof systems. Real systems |
| 4 | Digital analysis of the signal |
| 5 | Random vibrations |
| 6 | Measurement of vibrations |
| 7 | Human body vibrations |
| 8 | Applications of the measurement of vibration |

7. ASSESSMENT METHODS AND CRITERIA

| Description | Type | Final Eval. | Reassessn | % |
|---|-----------------------|-------------|-----------|--------|
| Theory | Written exam | Yes | Yes | 40,00 |
| Laboratory | Laboratory evaluation | No | No | 30,00 |
| continuous assessment | Others | No | Yes | 30,00 |
| TOTAL | | | | 100,00 |
| Observations | | | | |
| For the determination of the student's final mark, the following will be taken into account: student presentations, group work, continuous assessment and final exam. In case of a new health alert by COVID-19 makes impossible the evaluation in person, remote evaluation of the works (practical laboratory exercises and written tests) would be carried out. | | | | |
| Observations for part-time students | | | | |
| The same as for the rest of students | | | | |

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

M. J. Griffin, Handbook of Human Vibration. Academic Press, 1996.
 Leonard Meirovitch, Principles and techniques of vibrations. Prentice Hall 1996.
 I. L. Ver, L.L. Beranek, Noise and Vibration Control Engineering. Principles and Applications. Wiley, John & Sons, Incorporated 2005.

