

[GMX206] MECHANICAL ENGINEERING LABORATORY II

GENERAL INFORMATION

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|------------------|----------------------------------|-------------------|-----------------|---|
| Studies | DEGREE IN MECHANICAL ENGINEERING | | Subject | ? |
| Semester | 1 | Course | 3 | Mention / Field of specialisation |
| Character | OPTIONAL | | Language | EUSKARA |
| Plan | 2017 | Modality | Face-to-face | Total hours |
| Credits | 3 | Hours/week | 1.36 | 24.5 class hours + 50.5 non-class hours = 75 total hours |

PROFESSORS

| |
|---|
| MATEOS HEIS, MODESTO |
| ARETXABALETA RAMOS, LAURENTZI |
| UNZUETA ARANGUREN, GORKA |
| AZPI-ALDANONDO ECIOLAZA, JOSE RAMON (GOIERRI) |
| AZPI-IRURETAGOiena OSORO, XANTI (GOIERRI) |
| AZPI-PALOMO ARAMBURU, IÑIGO (GOIERRI) |
| BERASATEGUI AROSTEGUI, JOANES |
| TENA MERINO, IOSU |
| DOKBE-SELA BARRIAL, ANDRES |
| ALONSO DE MEZQUIA GONZALEZ, DAVID |
| ARAMENDI JAUREGUI, BEÑAT |
| ARAKAMA CAMINO, JON ANDER |
| ALCORTA ANDOAGA, ILLART |
| URIZAR AIZPURU, ENERITZ |

REQUIRED PREVIOUS KNOWLEDGE

| Subjects | Knowledge |
|---------------------|---|
| STATISTICS | <i>(No previous knowledge required)</i> |
| MECHANICS | |
| THERMODYNAMICS | |
| MECHANICAL DESIGN | |
| PROCESS ENGINEERING | |

SKILLS

VERIFICA SKILLS

SPECIFIC

- GMCE02** - To have the knowledge and skills for calculating, designing and testing machines
- GMCE03** - To have knowledge of applied thermal engineering
- GMCE04** - To have the knowledge and abilities required to apply the fundamentals of elasticity and resistance of materials to the behaviour of real solids.
- GMCE07** - To have knowledge of materials engineering and be able to apply it.
- GMCE08** - To be able to apply knowledge of manufacturing processes and systems, metrology and quality control
- GMCI04** - To know and use the principles of circuit theory and electrical machines
- GMCI07** - To know the principles of mechanisms and machine theory.

GENERAL

- GMCT03** - To build on basic concepts and technologies to expand knowledge of new theories and methods, and to acquire flexibility to adapt to new situations
- GMCT04** - To be able to take the initiative in problem solving, decision making, creativity, critical thinking, effective communication and the transfer of knowledge and skills in the field of mechanical engineering.
- GMCT05** - Possessing the knowledge for performing measurements, calculations, valuations, estimates, inspections, studies, reports, work plans and other similar tasks.

BASIC

- G_CB1** - To have proven to understand and have knowledge in a field of study based on general secondary education at a level found in advanced textbooks and including concepts at the forefront of their field of study.
- G_CB2** - To be able to apply knowledge to occupational or professional tasks; have the necessary skills to pose and defend arguments, and to solve problems within their field of study
- G_CB4** - To be able to communicate information, ideas, problems and solutions to both expert and lay audiences

ENAAE LEARNING RESULTS

| ENAAE LEARNING RESULTS | ECTS |
|---|------|
| ENA103 - Knowledge and comprehension: Awareness of the multidisciplinary context of engineering. | 2,68 |
| ENA109 - Research and innovation: Ability to consult and apply codes of good practice and security in their speciality. | 0,04 |
| ENA110 - Research and innovation: Capacity and ability to project and carry out experimental investigations, interpret results, and reach conclusions in their field of study. | 0,04 |

| | |
|--|------|
| ENA111 - Practical application of engineering: Understanding of the applicable techniques and methods for analysis, design and research and their limitations in the field of their speciality. | 0,04 |
| ENA113 - Practical application of engineering: Knowledge of application of materials, equipment and tools, engineering technology and processes, and their limitations in the field of their speciality. | 0,04 |
| ENA114 - Practical application of engineering: Ability to apply standards of engineering practice in their speciality. | 0,04 |
| ENA118 - Preparation of judgements: Ability to manage complex technical or professional activities or projects of their speciality, taking responsibility for decision making. | 0,04 |
| ENA119 - Communication and Teamwork: Ability to effectively communicate information, ideas, problems and solutions in the field of engineering and with society in general. | 0,04 |
| ENA120 - Communication and Teamwork: Ability to operate effectively in domestic and international contexts, individually and as a team, and to cooperate with both engineers and people from other disciplines. | 0,04 |

Total: 3

LEARNING RESULTS

RG304 Define the problem, develop the solution and present the conclusions in a efficient manner, arguing and justifying each one of them in writing.

| LEARNING ACTIVITIES | CH | NCH | TH |
|---|----------|---------------------------|-------|
| Development, writing and presentation of memorandums, reports, audiovisual material, etc. Relating to projects/POPBLs carried out individually or in teams | 3 h. | 7 h. | 10 h. |
| EVALUATION SYSTEM | W | MAKE-UP MECHANISMS | |
| Reports of solving exercises, case studies, computer practices, simulation practices and laboratory practices | 100% | <i>(No mechanisms)</i> | |

CH - Class hours: 3 h.
NCH - Non-class hours: 7 h.
TH - Total hours: 10 h.

RG305 Define the problem, develop the solution and present the conclusions in a efficient manner, arguing and justifying each one of them in spoken form.

| LEARNING ACTIVITIES | CH | NCH | TH |
|---|----------|---------------------------|------|
| Tutoring sessions and monitoring of training activities | 3 h. | 5 h. | 8 h. |
| EVALUATION SYSTEM | W | MAKE-UP MECHANISMS | |
| Technical skills, involvement in the project, finished work, obtained results, handed documentation, presentation and technical defence | 100% | <i>(No mechanisms)</i> | |

CH - Class hours: 3 h.
NCH - Non-class hours: 5 h.
TH - Total hours: 8 h.

RG302 Analyze the intervening variables in the problem and propose actions for a stable situation.

| LEARNING ACTIVITIES | CH | NCH | TH |
|---|----------|---------------------------|--------|
| Individual and team exercises | ,5 h. | 11,5 h. | 12 h. |
| Individual or team workshop and/or lab practice | 3,5 h. | | 3,5 h. |
| Individual and/or team computer simulation practice | 1,5 h. | | 1,5 h. |
| EVALUATION SYSTEM | W | MAKE-UP MECHANISMS | |
| Reports of solving exercises, case studies, computer practices, simulation practices and laboratory practices | 30% | <i>(No mechanisms)</i> | |
| Technical skills, involvement in the project, finished work, obtained results, handed documentation, presentation and technical defence | 40% | | |
| Observation of student participation and attitude in the proposed training activities | 30% | | |

CH - Class hours: 5,5 h.
NCH - Non-class hours: 11,5 h.
TH - Total hours: 17 h.

RG301 Assumes responsibilities in the work team, organizing and planning the tasks to be developed, facing the contingencies and encouraging the participation of its members.

| LEARNING ACTIVITIES | | CH | NCH | TH |
|---|--|--------|--------------------|--------|
| Individual and team exercises | | ,5 h. | 11,5 h. | 12 h. |
| Individual or team workshop and/or lab practice | | 3,5 h. | | 3,5 h. |
| Individual and/or team computer simulation practice | | 1,5 h. | | 1,5 h. |
| EVALUATION SYSTEM | | W | MAKE-UP MECHANISMS | |
| Reports of solving exercises, case studies, computer practices, simulation practices and laboratory practices | | 30% | (No mechanisms) | |
| Technical skills, involvement in the project, finished work, obtained results, handed documentation, presentation and technical defence | | 40% | | |
| Observation of student participation and attitude in the proposed training activities | | 30% | | |

CH - Class hours: 5,5 h.
NCH - Non-class hours: 11,5 h.
TH - Total hours: 17 h.

RG303 Select, apply and assess, in unknown contexts, the most appropriate methods, techniques, regulations, etc. of the engineer's profession

| LEARNING ACTIVITIES | | CH | NCH | TH |
|---|--|-------|--------------------|-------|
| Individual and team exercises | | ,5 h. | 15,5 h. | 16 h. |
| Individual or team workshop and/or lab practice | | 4 h. | | 4 h. |
| Individual and/or team computer simulation practice | | 3 h. | | 3 h. |
| EVALUATION SYSTEM | | W | MAKE-UP MECHANISMS | |
| Reports of solving exercises, case studies, computer practices, simulation practices and laboratory practices | | 30% | (No mechanisms) | |
| Technical skills, involvement in the project, finished work, obtained results, handed documentation, presentation and technical defence | | 40% | | |
| Observation of student participation and attitude in the proposed training activities | | 30% | | |

CH - Class hours: 7,5 h.
NCH - Non-class hours: 15,5 h.
TH - Total hours: 23 h.

CONTENTS

Laboratory work: P1 - Experimental analysis of a flat mechanism
P2 - Analysis of natural convection by means of thermography and CFD
P3 - Application of statistical process control (SPC) in a molding injection line
P4 - Influence of the assembly process on the mechanical assemblies operation

P5 - Starting methods of Asynchronous Motors
P6 - Machining: 4 axes and metrology

LEARNING RESOURCES AND BIBLIOGRAPHY

Learning resources

Labs
Moodle Platform
Specific Master Software

Bibliography

(No bibliography)