

[GML302] QUALITY ENGINEERING

GENERAL INFORMATION

Studies	DEGREE IN MECHANICAL ENGINEERING	Subject	?
Semester	1	Course	3
Character	COMPULSORY	Mention / Field of specialisation	
Plan	2022	Modality	Face-to-face
Credits	3	Language	EUSKARA/CASTELLANO/ENGLISH
		Hours/week	2.39
		Total hours	43 class hours + 32 non-class hours = 75 total hours

2030 AGENDA GOALS



PROFESSORS

ZENIGAONAINDIA MURUAMENDIARAZ, NEREA
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REQUIRED PREVIOUS KNOWLEDGE

Subjects	Knowledge
(No specific previous subjects required)	(No previous knowledge required)

LEARNING RESULTS

LEARNING RESULTS	KC	SK	AB	ECTS
GMR311 - To apply knowledge of manufacturing systems and processes, metrology and quality control		x		2,56
G-RTR1 - To develop interdisciplinary projects specific to their specialty and of gradual complexity, - becoming aware of respect for human rights and fundamental rights, and analyzing and assessing the impact of the proposed solutions on the SDGs - to acquire and/or apply basic, advanced and/or avant-garde, demonstrating the ability to work in multidisciplinary teams and/or undertake further studies with a high degree of autonomy		x		0,2
G-RTR2 - To express information, ideas and the arguments that support them in an orderly, clear and coherent manner, orally and in writing, based on quality information, self-made or obtained from different sources, using inclusive and non-discriminatory language		x		0,24
Total:				3

KC: Knowledge or Content / SK: Skills / AB: Abilities

ENAEF LEARNING RESULTS

- ENA102** - Knowledge and comprehension: Knowledge and comprehension of the engineering disciplines of their speciality, at the level necessary to acquire the rest of the competencies of the degree, including notions of the latest advances.
- ENA103** - Knowledge and comprehension: Awareness of the multidisciplinary context of engineering.
- ENA104** - Analysis in engineering: The ability to analyse complex products, processes and systems in their field of study; choose and apply relevant analytical, calculation and experimental methods in a suitable way; and correctly interpret the results of such analyses.
- ENA105** - Analysis in engineering: The ability to identify, formulate and solve engineering problems in their speciality; choose and apply adequately established analytical, calculation and experimental methods; and acknowledge the importance of social, health and safety, environmental, economic, and industrial restrictions.
- ENA106** - Engineering projects: Ability to project, design and develop complex products (parts, components, finished products, etc.), processes and systems of their speciality, which meet the established requirements, including awareness of the social, health and safety, environmental, economic and industrial aspects, as well as selecting and applying appropriate project methods.
- ENA107** - Engineering projects: Project capacity some state-of-the-art knowledge of their engineering speciality.
- ENA108** - Research and innovation: Ability to carry out bibliographic searches and consult and use databases and other information sources with discretion, in order to carry out simulation and analysis with the aim of conducting research on technical topics of their speciality.
- 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.
- ENA115** - Practical application of engineering: Knowledge of the social, health and safety, environmental, economic and industrial implications of engineering practice.
- ENA116** - Practical application of engineering: General ideas on economic, organisational and management issues (such as project, risk and change management) in the industrial and business context.
- ENA118** - Preparation of judgements: Ability to manage complex technical or professional activities or projects of their speciality, taking responsibility for decision making.
- ENA119** - Communication and Teamwork: Ability to effectively communicate information, ideas, problems and solutions in the field of engineering and with society in general.
- 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.
- ENA121** - Continued training: Ability to acknowledge the need for their own continued training and to undertake this activity throughout their professional life independently.
- ENA122** - Continued training: Ability to stay up to date on science and technology innovations.

SECONDARY LEARNING RESULTS

1RGM392 (1 sem)

LEARNING ACTIVITIES

Carrying out/resolving projects/challenges/cases, etc. to provide solutions to problems in interdisciplinary contexts, real and/or simulated, individually and/or in teams

CH

NCH

TH

1 h.

1 h.

EVALUATION SYSTEM

W

Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems

Comments: Students have the responsibility of meeting the tutor to do the tracking of the project and to ensure the achievement of the goals.

100%

MAKE-UP MECHANISMS

(No mechanisms)

Comments: Continuous evaluation. FEEDBACK received from the tutor and the experts in the project follow-up meetings.

CH - Class hours: 0 h.

NCH - Non-class hours: 1 h.

TH - Total hours: 1 h.

RGM328 [I] Identificar y aplicar las diferentes técnicas utilizadas para la planificación y mejora de la calidad

LEARNING ACTIVITIES

Conducting tests, giving presentations, presenting defences, taking examinations and/or doing checkpoints

CH

NCH

TH

1 h.

2 h.

3 h.

Carrying out/resolving projects/challenges/cases, etc. to provide solutions to problems in interdisciplinary contexts, real and/or simulated, individually and/or in teams

8 h.

7 h.

15 h.

Carrying out exercises and solving problems individually and/or in teams

1 h.

1 h.

EVALUATION SYSTEM

W

Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems

Presentation and defence of exercises, case studies, computer practical work, simulation practical work, laboratory practical work, term projects, end of degree project, master's thesis, challenges and problems

Individual written and/or oral tests or individual coding/programming tests

50%

40%

Comments: KP1: Control Point (30%) EN1: Zero defects application in production processes -> Case Study (Practice Work) (50%) Semester project: 20% Students have the responsibility of meeting the experts to do the tracking of the project and to ensure the achievement of the goals.

MAKE-UP MECHANISMS

Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems

Presentation and defence of exercises, case studies, computer practical work, simulation practical work, laboratory practical work, term projects, end of degree project, master's thesis, challenges and problems

Individual written and/or oral tests or individual coding/programming tests

Comments: Continuous assessment and project feedback.

CH - Class hours: 9 h.

NCH - Non-class hours: 10 h.

TH - Total hours: 19 h.

1RGM391 (1 sem)

LEARNING ACTIVITIES

Carrying out/resolving projects/challenges/cases, etc. to provide solutions to problems in interdisciplinary contexts, real and/or simulated, individually and/or in teams

CH

NCH

TH

1 h.

1 h.

2 h.

EVALUATION SYSTEM

W

Self-assessment

50%

MAKE-UP MECHANISMS

Reports on the completion of exercises, case studies, computer

Observation (technical capacity, attitude and participation) 50%

Comments: The average of the marks of the tutor's assessment and the self-assessment carried out by the work team is calculated, using the defined rubrics. Afterwards, the final mark is calculated taking into account the co-evaluation among the members of the team.

CH - Class hours: 1 h.

NCH - Non-class hours: 1 h.

TH - Total hours: 2 h.

exercises, simulation exercises, laboratory exercises, term projects, challenges and problems

1RGM394 (1 sem)

LEARNING ACTIVITIES

Development and writing of records, reports, presentations, audiovisual material, etc. on projects/work experience/challenges/case studies/experimental investigations carried out individually and/or in teams

CH

1 h.

NCH

2 h.

TH

3 h.

EVALUATION SYSTEM

W

Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems

100%

Comments: Students have the responsibility of meeting the tutor to do the tracking of the project and to ensure the achievement of the goals.

MAKE-UP MECHANISMS

Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems

Comments: Continuous evaluation. FEEDBACK received from the tutor and the experts in the project follow-up meetings.

CH - Class hours: 1 h.

NCH - Non-class hours: 2 h.

TH - Total hours: 3 h.

1RGM390 (1 sem)

LEARNING ACTIVITIES

Carrying out/resolving projects/challenges/cases, etc. to provide solutions to problems in interdisciplinary contexts, real and/or simulated, individually and/or in teams

CH

1 h.

NCH

1 h.

TH

2 h.

EVALUATION SYSTEM

W

Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems

100%

Comments: Students have the responsibility of meeting the tutor to do the tracking of the project and to ensure the achievement of the goals.

MAKE-UP MECHANISMS

Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems

Comments: Continuous evaluation. FEEDBACK received from the tutor and the experts in the project follow-up meetings.

CH - Class hours: 1 h.

NCH - Non-class hours: 1 h.

TH - Total hours: 2 h.

RGM327 [I] *Identificar y utilizar diferentes herramientas y estrategias para asegurar la calidad y Cero Defectos de un proceso*

LEARNING ACTIVITIES

Conducting tests, giving presentations, presenting defences, taking examinations and/or doing checkpoints

CH

2 h.

NCH

3 h.

TH

5 h.

Carrying out/resolving projects/challenges/cases, etc. to provide solutions to problems in interdisciplinary contexts, real and/or simulated, individually and/or in teams

1 h.

2 h.

3 h.

Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	24 h.	24 h.
Carrying out exercises and solving problems individually and/or in teams	3 h.	10 h.
		13 h.

EVALUATION SYSTEM

W

Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems

20%

Presentation and defence of exercises, case studies, computer practical work, simulation practical work, laboratory practical work, term projects, end of degree project, master's thesis, challenges and problems

50%

Individual written and/or oral tests or individual coding/programming tests

30%

Comments: KP1: Control Point (30%) EN1: Zero defects application in production processes -> Case Study (Practice Work) (50%) PBL:20% Students have the responsibility of meeting the experts to do the tracking of the project and to ensure the achievement of the goals.

MAKE-UP MECHANISMS

Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems

Individual written and/or oral tests or individual coding/programming tests

Comments: Continuous assessment and project feedback.

CH - Class hours: 30 h.

NCH - Non-class hours: 15 h.

TH - Total hours: 45 h.

1RGM393 (1 sem)

LEARNING ACTIVITIES

CH

NCH

TH

Development and writing of records, reports, presentations, audiovisual material, etc. on projects/work experience/challenges/case studies/experimental investigations carried out individually and/or in teams

1 h.

2 h.

3 h.

EVALUATION SYSTEM

W

Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems

100%

Comments: Students have the responsibility of meeting the tutor to do the tracking of the project and to ensure the achievement of the goals.

MAKE-UP MECHANISMS

Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems

Comments: Continuous evaluation. FEEDBACK received from the tutor and the experts in the project follow-up meetings.

CH - Class hours: 1 h.

NCH - Non-class hours: 2 h.

TH - Total hours: 3 h.

CONTENTS

1.INTRODUCTION TO QUALITY MANAGEMENT

I.Definition of Quality

II.Quality Objectives

III.Continuous improvement-Deming cycle

IV.Evolution of Quality

2.QUALITY AND PROCESS CONTROL

I.Introduction to quality control

II.Problems of quality control

III.Variability of processes (5M)

IV.type description

i.Final control

ii.Successive verification system

iii.Self Inspection

iv.Statistical process control (SPC)

V.Basic Statistics

VI.Control charts

VII. Inspection at Source (POKA YOKE)

3.QUALITY TOOLS AND CONTINUOUS IMPROVEMENT TECHNICS

I.Objectives of quality tools

II.7 Basic tools

i.Ishikawa Diagram (Fish bone)

ii.Stratification diagram

iii.Checking list

iv.Histogram

v.Pareto Diagram

vi.Control charts

vii.Dispersion diagram

III.FMEA

IV.CONTROL PLAN

V.OTHER TOOLS (5 WHY?,…)

4.TOTAL QUALITY MANAGEMENT – QUALITY PLANNING AND PREVENTION

I.APQP

II.TOTAL QUALITY MANAGEMENT

III.EFQM MODEL AND ISO 9001 STANDARD

LEARNING RESOURCES AND BIBLIOGRAPHY

Learning resources

Subject notes

Moodle Platform

Lab practical training

Bibliography

<https://katalogoa.mondragon.edu/janium-bin/sumario.pl?Id=20230904151109>