

Course: 2024 / 2025 - Course planning



			[GMF <u>3</u>	02] <u>MECH</u>	ANICAL <u>DESI</u>	GN			
			G	ENERAL IN	FORMATION				
	Studies	DEGREE IN MEC	HANICAL ENGIN	EERING	Subject	?			
	Semester	1	Course	3	Mention / Field of				
	Character	COMPULSORY			specialisation				
	Plan	2022	Modality	Face-to-face	Language	EUSKARA/CAS	TELLAN	IO/ENGLIS	Н
	Credits	6	Hours/week	3.56	Total hours	64 class hours - hours	- 86 non	-class hour	s = <u>150 total</u>
				2030 AGEN	DA GOALS				
8 BECENT WORK AND ECONOMIC GROWT	D 9 NOUSIRY INVIATION ADDREASTRUCTURE								
				PROFE	SSORS				
	IRAGUI SA	N PEDRO, MIKEL							
	ULACIA GA	RMENDIA, IBAI							
	ARETXABA	LETA RAMOS, L	AURENTZI						
	AZPI-ZURI	ARRAIN BERASA	TEGUI, AITOR (G	OIERRI)					
	IÑURRITEC	GUI MARROQUIN	, AUREA						
	OYANGUR	EN GARCIA, AITO	DR						
	INSAUSTI	GARMENDIA, OLA	ATZ						
		0.1.1	REQUI			GE			
		Subje	Cts		Machanical Design	Knowl	eage		
GRAF		SSION II			2D/3D design softw	are (SolidWorks			
INTR	ODUCTION .	TO MECHANICAL	DESIGN		20/00 design soliti				
				I FARNING	RESULTS				
LEAF	RNING RESL	JLTS					кс з	SK AB	ECTS
GMR	306 - To dem	onstrate ability to o	calculate, design a	nd test machine	S		-	x	5,08
G-RT	R1 - To devel	lop interdisciplinar	y projects specific	to their specialty	/ and of gradual comp	olexity, -		x	0,44
impa	ct of the prop	osed solutions on	the SDGs - to acq	uire and/or appl	y basic, advanced an	d/or			
avant	t-garde, dem	onstrating the abili	ty to work in multic	disciplinary team	is and/or undertake fu	irther studies			
With a	a high degree R2 - To expre	e of autonomy	eas and the aroum	ents that sunno	rt them in an orderly	clear and		x	0.48
cohei	rent manner,	orally and in writir	ig, based on qualit	y information, se	elf-made or obtained	rom different			-,
sourc	es, using inc	lusive and non-dis	criminatory langua	age					
								Total:	6
KC: Kr	nowledge or Cor								
F b 1 c	•	ntent / SK: Skills / AB: /	Abilities						
		ntent / SK: Skills / AB: /	Abilities						
ENA ENA nece	EE LEARNII 102 - Knowlee ssary to acqu	ntent / SK: Skills / AB: / NG RESULTS dge and comprehe uire the rest of the	Abilities ension: Knowledge competencies of t	and compreher he degree, inclu	nsion of the engineeri Iding notions of the la	ng disciplines of test advances.	their spe	eciality, at th	ne level
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ENA111 - Practical application of engineering: Understanding of the applicable techniques and methods fr analysis, design and research and their limitations in the field of their speciality.

ENA112 - Practical application of engineering: Practical competency to solve complex problems, carry out complex engineering projects, and conduct investigations specific to their speciality.

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.





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ENA114 - Practical application of engineering: Ability to apply standards of engineering practice in their speciality.

ENA115 - Practical application of engineering: Knowledge of the social, health and safety, environmental, economic and industrial implications of engineering practice.

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

LEARNING ACTIVITIES	СН	NCH	ТН			
Carrying out/resolving projects/challenges/cases, etc. to interdisciplinary contexts, real and/or simulated, individual	lutions to problems in in teams	1 h.	2 h.	3 h.		
EVALUATION SYSTEM	W	MAKE-UP MECHANI	SMS			
Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems	100%	Comments: Continuo tutor and the experts in	<i>(No mech</i> us evaluatio the project f	<i>anisms)</i> n. FEEDBACK ollow-up meeti	received from ngs	the
CH - Class hours: 1 h. NCH - Non-class hours: 2 h. TH - Total hours: 3 h.						

1RGM391 (1 sem)

LEARNING ACTIVITIES			СН	NCH	тн
Carrying out/resolving projects/challenges/cases, etc. to pro interdisciplinary contexts, real and/or simulated, individually	ovide sol / and/or i	utions to problems in n teams	1 h.	3 h.	4 h.
EVALUATION SYSTEM W Self-assessment 50% 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, sing the defined rubrics. Afterwards, the final mark is calculated aking into account the co-evaluation among the members of the eam.		MAKE-UP MECHANIS	SMS		
		Presentation and defence of exercises, case studies, comput practical work, simulation practical work, laboratory practical term projects, end of degree project, master's thesis, challeng and problems			
CH - Class hours: 1 h. NCH - Non-class hours: 3 h. IH - Total hours: 4 h.					
1RGM394 (1 sem)					
LEARNING ACTIVITIES			СН	NCH	тн
Development and writing of records, reports, presentations,	, audiovis	sual material, etc. on	1 h.	5 h.	6 h.

W



100%



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

(No mechanisms)

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: 5 h. TH - Total hours: 6 h.

RGM316 [!] Conocer y realizar ensayos de validación de máquinas

LEARNING ACTIVITIES			СН	NCH	тн
Conducting tests, giving presentations, presenting defence checkpoints	2 h.	7 h.	9 h.		
Presentation by the teacher in the classroom, in participato procedures associated with the subjects	3 h.		3 h.		
Practical work in workshops and/or laboratories, individually	y and/or	in teams	8 h.	4 h.	12 h.
Tutoring sessions and monitoring of training activities			2 h.	4 h.	6 h.
EVALUATION SYSTEM	W	MAKE-UP MECHANISM	IS		
Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems	35%		(No mech	anisms)	
Individual written and/or oral tests or individual coding/programming tests	50%				
Observation (technical capacity, attitude and participation)	15%				
CH - Class hours: 15 h. NCH - Non-class hours: 15 h. TH - Total hours: 30 h.					

1RGM390 (1 sem)					
LEARNING ACTIVITIES			СН	NCH	тн
Carrying out/resolving projects/challenges/cases, etc. to p interdisciplinary contexts, real and/or simulated, individua	provide sol Ily and/or i	utions to problems in n teams	1 h.	3 h.	4 h.
EVALUATION SYSTEM	W	MAKE-UP MECHANIS	SMS		
Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems	100%	Presentation and defer practical work, simulat term projects, end of d and problems Comments: Continuou tutor and the experts in	nce of exerc ion practical egree proje us evaluation the project f	ises, case stud work, laborato ct, master's the n. FEEDBACK ollow-up meeti	dies, computer ory practical work, esis, challenges received from the ngs.
CH - Class hours: 1 h. NCH - Non-class hours: 3 h. TH - Total hours: 4 h.					

IRGM393 (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 1 h. 5 h. 6 h.





EVALUATION SYSTEM	W	MAKE-UP MECHAN	ISMS		
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	100%	Comments: Continue tutor and the experts in	(No mech ous evaluation the project f	anisms) n. FEEDBACK ollow-up meet	(received from
H - Class hours: 1 h. CH - Non-class hours: 5 h. H - Total hours: 6 h.					
RGM315 [!] Diseñar conjuntos mecánicos, dimension ecesarios y elaborando documentación técnica sobre	ando elem los result	entos mecánicos, def ados	iiniendo las i	tolerancias y	los ajustes
LEARNING ACTIVITIES			СН	NCH	тн
Presentation by the teacher in the classroom, in participat procedures associated with the subjects	ory classes	s, of concepts and	20 h.	6 h.	26 h.
Carrying out exercises and solving problems individually a	and/or in tea	ams	14 h.	20 h.	34 h.
EVALUATION SYSTEM	W	MAKE-UP MECHAN	ISMS		
ndividual written and/or oral tests or individual	100%	Individual written and	/or oral tests	or individual	
CH - Non-class hours: 26 h. I - Total hours: 60 h.					
CH - Non-class hours: 26 h. H - Total hours: 60 h. RGM317 [!] Realiza los cálculos, diseño y los planos specificaciones dadas.	necesarios	s para la fabricación d	'e una máqui	ina a partir de	e unas
CH - Non-class hours: 26 h. H - Total hours: 60 h. CGM317 [!] Realiza los cálculos, diseño y los planos specificaciones dadas.	necesarios	s para la fabricación d	'e una máqui СН	ina a partir de NCH	e unas TH
CH - Non-class hours: 26 h. H - Total hours: 60 h. RGM317 [!] Realiza los cálculos, diseño y los planos a specificaciones dadas. LEARNING ACTIVITIES Carrying out/resolving projects/challenges/cases, etc. to p	necesarios	s para la fabricación d	e una máqui CH 8 h.	ina a partir de <u>NCH</u> 27 h.	e unas TH 35 h.
CH - Non-class hours: 26 h. H - Total hours: 60 h. RGM317 [!] Realiza los cálculos, diseño y los planos a specificaciones dadas. LEARNING ACTIVITIES Carrying out/resolving projects/challenges/cases, etc. to p interdisciplinary contexts, real and/or simulated, individual Carrying out visits and/or learning trips to other university	necesarios provide solu lly and/or in centres, lal	s para la fabricación d itions to problems in i teams boratories, companies	e una máqui <u>CH</u> 8 h. 2 h.	ina a partir de <u>NCH</u> 27 h.	e unas TH 35 h. 2 h.
CH - Non-class hours: 26 h. I - Total hours: 60 h. CH - Non-class hours: 26 h. I - Total hours: 60 h. Cargina Constant of the second secon	necesarios provide solu lly and/or in centres, lal echanical el	s para la fabricación d tions to problems in teams boratories, companies ements.	e una máqui <u>CH</u> 8 h. 2 h.	ina a partir de <u>NCH</u> 27 h.	e unas TH 35 h. 2 h.
CH - Non-class hours: 26 h. H - Total hours: 60 h.	necesarios provide solu lly and/or in centres, lal echanical el W	s para la fabricación d ntions to problems in teams boratories, companies ements. MAKE-UP MECHAN	l <mark>e una máqui</mark> <u>CH</u> 8 h. 2 h. ISMS	ina a partir de <u>NCH</u> 27 h.	e unas TH 35 h. 2 h.
CH - Non-class hours: 26 h. H - Total hours: 60 h. CH - Total hours: 60 h. Carrying out/resolving projects/challenges/cases, etc. to p interdisciplinary contexts, real and/or simulated, individual Carrying out visits and/or learning trips to other university and/or thermal power plants Comments: IGUS company talk about state-of-the-art me EVALUATION SYSTEM Presentation and defence of exercises, case studies,	necesarios provide solu lly and/or in centres, lal echanical el <u>W</u> 100%	tions to problems in teams boratories, companies ements.	le una máqui CH 8 h. 2 h. ISMS (No mech	ina a partir de <u>NCH</u> 27 h. anisms)	e unas TH 35 h. 2 h.
CH - Non-class hours: 26 h. H - Total hours: 60 h. CGM317 [!] Realiza los cálculos, diseño y los planos a specificaciones dadas. LEARNING ACTIVITIES Carrying out/resolving projects/challenges/cases, etc. to p interdisciplinary contexts, real and/or simulated, individual Carrying out visits and/or learning trips to other university and/or thermal power plants Comments: IGUS company talk about state-of-the-art me EVALUATION SYSTEM Presentation and defence of exercises, case studies, computer practical work, simulation practical work, aboratory practical work, term projects, end of degree project, master's thesis, challenges and problems Comments: Students have the responsibility of macting	necesarios provide solu lly and/or in centres, lal echanical el <u>W</u> 100%	tions to problems in teams boratories, companies ements. <u>MAKE-UP MECHAN</u> Comments: Continuo tutor and the experts in	e una máqui <u>CH</u> 8 h. 2 h. ISMS (No mech pus evaluation n the project fo	ina a partir de <u>NCH</u> 27 h. anisms) n. FEEDBACK ollow-up meet	e unas TH 35 h. 2 h.
CH - Non-class hours: 26 h. H - Total hours: 60 h. RGM317 [!] Realiza los cálculos, diseño y los planos is specificaciones dadas. LEARNING ACTIVITIES Carrying out/resolving projects/challenges/cases, etc. to p interdisciplinary contexts, real and/or simulated, individual Carrying out visits and/or learning trips to other university and/or thermal power plants Comments: IGUS company talk about state-of-the-art me EVALUATION SYSTEM 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 Comments: Students have the responsability of meeting kperts to do the tracking of the project and to ensure the chievement of the goals.	necesarios provide solu lly and/or in centres, lal echanical el <u>W</u> 100%	tions to problems in teams boratories, companies ements. <u>MAKE-UP MECHAN</u> Comments: Continue tutor and the experts in	e una máqui CH 8 h. 2 h. ISMS (No mech pus evaluation n the project fo	ina a partir de <u>NCH</u> 27 h. anisms) n. FEEDBACK ollow-up meet	TH 35 h. 2 h.
 CH - Non-class hours: 26 h. H - Total hours: 60 h. RGM317 [!] Realiza los cálculos, diseño y los planos especificaciones dadas. LEARNING ACTIVITIES Carrying out/resolving projects/challenges/cases, etc. to p interdisciplinary contexts, real and/or simulated, individual Carrying out visits and/or learning trips to other university and/or thermal power plants Comments: IGUS company talk about state-of-the-art metexture project, master's thesis, challenges and problems Comments: Students have the responsability of meeting experts to do the tracking of the project and to ensure the chievement of the goals. H - Class hours: 10 h. CH - Non-class hours: 27 h. H - Total hours: 37 h. 	necesarios	s para la fabricación d nitions to problems in teams boratories, companies ements. <u>MAKE-UP MECHAN</u> Comments: Continuo tutor and the experts in	e una máqui CH 8 h. 2 h. ISMS (No mech bus evaluation n the project fo	ina a partir de <u>NCH</u> 27 h. anisms) n. FEEDBACK ollow-up meet	TH 35 h. 2 h.
 CH - Non-class hours: 26 h. H - Total hours: 60 h. RGM317 [!] Realiza los cálculos, diseño y los planos especificaciones dadas. LEARNING ACTIVITIES Carrying out/resolving projects/challenges/cases, etc. to p interdisciplinary contexts, real and/or simulated, individual Carrying out visits and/or learning trips to other university and/or thermal power plants Comments: IGUS company talk about state-of-the-art metexpection 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 Comments: Students have the responsability of meeting experts to do the tracking of the project and to ensure the chievement of the goals. H - Class hours: 10 h. CH - Non-class hours: 27 h. H - Total hours: 37 h. 	necesarios	s para la fabricación d nitions to problems in teams boratories, companies ements. <u>MAKE-UP MECHAN</u> Comments: Continuo tutor and the experts in	e una máqui CH 8 h. 2 h. ISMS (No mech bus evaluation n the project fo	ina a partir de <u>NCH</u> 27 h. anisms) n. FEEDBACK ollow-up meet	e unas TH 35 h. 2 h.

- Modelling principles
- Mechanical transmissions





- Steady-state vs. transient conditions
- 2. Dimensioning of machine elements:
- Rolling elements:
- Rolling bearings
- Ball screws
- Guiding systems
- Belt transmission

Learning resources	Bibliography
Subject notes Technical articles	MOTT, Robert L. Diseño de elementos de máquinas. Pearson Prentice Hall (2006)
Class presentations Video projections	DECKER, Karl-Heinz. Elementos de máquinas (Manual del Ingeniero Técnico, Volumen XIII) URMO
Student book Slides of the subject	BUDYNAS, Richard. Diseño en ingeniería mecánica de Shigley. McGraw-Hill Interamericana de España S.L.; Edición: 8 (26 de febrero de 2008)
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