



	[GMG302] PROCES	<u>SS ENGINEER</u>					
	GENERAL IN						
Studies DEGREE IN MEC			MANUFACTUR	ING PR	OCE	SS ENG	INEERING
Semester 2	Course 2	Mention / Field of		-			-
Character COMPULSORY		specialisation					
<b>Plan</b> 2022	Modality Face-to-face	Language	EUSKARA/CAS	TELLAN	NO		
Credits 4,5	Hours/week 3.75	Total hours	67.52 class hour total hours	rs + 44.9	98 nc	on-class l	hours = <u>112</u>
	2030 AGEN	DA GOALS					
DESENT WORK AND STANAILE CITES AND PARTICIPAL AND COMMUNITIES							
<b>M</b> 🛞 🔒							
	PROFE	SSORS					
UGARTE BARRENA, DONE							
AZPI-ALDANONDO ECIOLAZ	. , ,						
ORTIZ DE ZARATE BENGOA							
Subject	cts		Knowle	edge			
GRAPHIC EXPRESSION II PROCESS ENGINEERING I		Trigonometry notion	าร				
FOUNDATIONS OF MATERIALS SC							
CONDATIONS OF MATERIALS SC	LEARNING						
	LEARNING	RESULIS		KO	<u> </u>	4.0	FOTO
LEARNING RESULTS GMR210 - To know and apply manufa	acturing metrology and quality co	ntrol systems and pro	Cesses	КС	sk x	AB	4,02
GRTR1 - To develop interdisciplinary					x		0,32
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pecoming aware of respect for huma	an rights and tundamental rights a		boooning the				
			d/or				
impact of the proposed solutions on	the SDGs - to acquire and/or appl	ly basic, advanced an					
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impact of the proposed solutions on avant-garde, demonstrating the abilit with a high degree of autonomy	the SDGs - to acquire and/or appl ty to work in multidisciplinary team	ly basic, advanced an ns and/or undertake fu	urther studies		x		0,16
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**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.

## SECONDARY LEARNING RESULTS

LEARNING ACTIVITIES			СН	NCH	тн
Development and writing of records, reports, presentation projects/work experience/challenges/case studies/experiendividually and/or in teams			1,34 h.	,66 h.	2 h.
VALUATION SYSTEM	W	MAKE-UP MECHANI	SMS		
Reports on the completion of exercises, case studies, omputer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems comments: Continuous evaluation. FEEDBACK receive or and the experts in the project follow-up meetings	100% d from the	<b>Comments:</b> Continuo tutor and the experts in		. FEEDBACK	
I - Class hours: 1,34 h. CH - Non-class hours: ,66 h.					
H - Total hours: 2 h.					
I - Total hours: 2 h. (GM231 [!] Crear hojas de procesos de mecanizado on máquinas convencionales y CNC	económia	cas teniendo en cuenta l		-	
GM231 [!] Crear hojas de procesos de mecanizado n máquinas convencionales y CNC EARNING ACTIVITIES			СН	лсн	тн
GM231 [!] Crear hojas de procesos de mecanizado n máquinas convencionales y CNC EARNING ACTIVITIES Development and writing of records, reports, presentation rojects/work experience/challenges/case studies/experi	ns, audiov	isual material, etc. on		-	
GM231 [!] Crear hojas de procesos de mecanizado n máquinas convencionales y CNC EARNING ACTIVITIES Development and writing of records, reports, presentation rojects/work experience/challenges/case studies/experi individually and/or in teams conducting tests, giving presentations, presenting defend	ns, audiov nental inv	isual material, etc. on estigations carried out	<u>СН</u> 1 h.	лсн	тн
GM231 [!] Crear hojas de procesos de mecanizado n máquinas convencionales y CNC EARNING ACTIVITIES Development and writing of records, reports, presentation rojects/work experience/challenges/case studies/experi individually and/or in teams Conducting tests, giving presentations, presenting defend heckpoints Presentation by the teacher in the classroom, in participa	ns, audiov nental inv ces, takinç	isual material, etc. on estigations carried out examinations and/or doir	<u>СН</u> 1 h.	лсн	<u>ТН</u> 13 h.
GM231 [!] Crear hojas de procesos de mecanizado máquinas convencionales y CNC EARNING ACTIVITIES Development and writing of records, reports, presentation rojects/work experience/challenges/case studies/experindividually and/or in teams Conducting tests, giving presentations, presenting defend heckpoints Presentation by the teacher in the classroom, in participal rocedures associated with the subjects	ns, audiov mental inv ces, taking tory classe	isual material, etc. on estigations carried out examinations and/or doir es, of concepts and	CH 1 h. ng 2 h.	<b>NCH</b> 12 h.	<b>ТН</b> 13 h. 2 h.
GM231 [1] Crear hojas de procesos de mecanizado in máquinas convencionales y CNC EARNING ACTIVITIES Development and writing of records, reports, presentation projects/work experience/challenges/case studies/experi- ndividually and/or in teams Conducting tests, giving presentations, presenting defend heckpoints Presentation by the teacher in the classroom, in participa procedures associated with the subjects Carrying out exercises and solving problems individually	ns, audiov mental inv ces, taking tory classe	isual material, etc. on estigations carried out examinations and/or doir es, of concepts and	CH 1 h. 2 h. 17 h. 5 h.	<b>NCH</b> 12 h. 2 h.	<i>TH</i> 13 h. 2 h. 19 h.
I - Total hours: 2 h.	ns, audiov mental inv ces, taking tory classe and/or in t	isual material, etc. on estigations carried out examinations and/or doir es, of concepts and eams	CH 1 h. 1 g 2 h. 17 h. 5 h. SMS for oral tests of ests	NCH 12 h. 2 h. 3,5 h. or individual	<b>TH</b> 13 h. 2 h. 19 h. 8,5 h.

NCH - Class hours: 25 h. NCH - Non-class hours: 17,5 h. TH - Total hours: 42,5 h.

2RGM294 (2 sem)						
LEARNING ACTIVITIES			СН	NCH	тн	
Development and writing of records, reports, presentation projects/work experience/challenges/case studies/experin individually and/or in teams			1,34 h.	,66 h.	2 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	100%	Comments: Continuc	(No mecha	,	received from th	he





project, master's thesis, challenges and problems **Comments:** Continuous evaluation. FEEDBACK received from the tutor and the experts in the project follow-up meetings

tutor and the experts in the project follow-up meetings

CH - Class hours: 1,34 h. NCH - Non-class hours: ,66 h. TH - Total hours: 2 h.

RGM230 [!] Crear hojas de proceso de fresado y taladrado, y crear manualmente sus programas CNC СН NCH ΤН LEARNING ACTIVITIES 1 h. 14 h. 15 h. 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. 1 h. Conducting tests, giving presentations, presenting defences, taking examinations and/or doing checkpoints 14,5 h. 1 h. 15,5 h. Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects 4 h. 2 h. 6 h. Carrying out exercises and solving problems individually and/or in teams

**Comments:** The occupational safety aspects related to machining processes are mentioned and the effects that may be generated on the environment are analysed. Use of updated CAD-CAM software. Use of updated catalogues The costs of machining processes are worked out, calculating machining times and hourly rates.

EVALUATION SYSTEM	W	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	85%	Individual written and/or oral tests or individual coding/programming tests <b>Comments:</b> The first exam will have a weight of 25% and the make-up will have a weight of 75%.

CH - Class hours: 20,5 h. NCH - Non-class hours: 17 h. TH - Total hours: 37,5 h.

LEARNING ACTIVITIES			СН	NCH	ТН
Carrying out/resolving projects/challenges/cases, etc. to interdisciplinary contexts, real and/or simulated, individua			2 h.	1 h.	3 h.
EVALUATION SYSTEM	W	MAKE-UP MECHAN	ISMS		
Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems	50%	<b>Comments:</b> Continuo tutor and the experts in		n. FEEĎBACK	
Co-assessment	50%				
<b>Comments:</b> The average of the marks of the tutor's asse and the self-assessment carried out by the work team is ca using the defined rubrics. Afterwards, the final mark is calc nultiplying the average mark by a factor calculated on the he co-evaluation among the members of the group.	alculated, ulated by				

## 2RGM292 (2 sem)



## Goi Eskola Politeknikoa | Mondragon Unibertsitatea Course: 2024 / 2025 - Course planning



			СН	NCH	TH
Carrying out/resolving projects/challenges/cases, etc. to p interdisciplinary contexts, real and/or simulated, individual			1,34 h.	,66 h.	2 h.
EVALUATION SYSTEM	w	MAKE-UP MECHAN	ISMS		
Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems	50%	<b>Comments:</b> Continuctive tutor and the experts in		n. FEEÓBACK	
Co-assessment <b>Comments:</b> The average of the marks of the tutor's asses and the self-assessment carried out by the work team is cal sing the defined rubrics. Afterwards, the final mark is calcu- ultiplying the average mark by a factor calculated on the b e co-evaluation among the members of the group.	lculated, ulated by				
H - Class hours: 1,34 h. CH - Non-class hours: ,66 h. I - Total hours: 2 h.					
2RGM290 (2 sem)					
EARNING ACTIVITIES			СН	NCH	ТН
Carrying out/resolving projects/challenges/cases, etc. to p nterdisciplinary contexts, real and/or simulated, individual			2 h.	1 h.	3 h.
EVALUATION SYSTEM	W	MAKE-UP MECHAN	ISMS		
exercises, term projects, challenges and problems	l from the	<b>Comments:</b> Continuot tutor and the experts in			
exercises, term projects, challenges and problems <b>Comments:</b> Continuous evaluation. FEEDBACK received tor and the experts in the project follow-up meetings <b>H - Class hours:</b> 2 h. <b>CH - Non-class hours:</b> 1 h.	from the				
computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems <b>Comments:</b> Continuous evaluation. FEEDBACK received tor and the experts in the project follow-up meetings <b>H - Class hours:</b> 2 h. <b>CH - Non-class hours:</b> 1 h. <b>H - Total hours:</b> 3 h.	I from the				
exercises, term projects, challenges and problems <b>Comments:</b> Continuous evaluation. FEEDBACK received tor and the experts in the project follow-up meetings <b>H - Class hours:</b> 2 h. <b>CH - Non-class hours:</b> 1 h.		tutor and the experts in	the project fo	ollow-up meeti	ngs
exercises, term projects, challenges and problems Comments: Continuous evaluation. FEEDBACK received tor and the experts in the project follow-up meetings H - Class hours: 2 h. CH - Non-class hours: 1 h. H - Total hours: 3 h. CEMP232 [1] Crear y defender hojas de procesos de me or ordenador LEARNING ACTIVITIES Carrying out/resolving projects/challenges/cases, etc. to p	ecanizad	tutor and the experts in o económicos haciendo	the project fo	ico de la fabr	ngs ricación asist
exercises, term projects, challenges and problems Comments: Continuous evaluation. FEEDBACK received tor and the experts in the project follow-up meetings H - Class hours: 2 h. CH - Non-class hours: 1 h. H - Total hours: 3 h. CGM2322 [!] Crear y defender hojas de procesos de me for ordenador LEARNING ACTIVITIES	ecanizad	tutor and the experts in o económicos haciendo	o un uso bás	ico de la fabr	ngs icación asist





NCH - Non-class hours: 6,5 h. TH - Total hours: 20,5 h.

## CONTENTS

1.- Conventional Material Removal Processes

Drilling: machines and operations

Milling: machines and operations

Turning: machines and operations

Coolants

Cutting tools: materials and geometry

Cutting tool selection

Machining times

Cutting force and power

Grinding processes

Process planning

2.- Other Processes:

Additive Manufacturing (AM)

Electro Discharge Machining (EDM)

High Speed Milling (HSM)

3.- Computer aided tools for manufacturing

FAGOR CNC programming

CAM programming

LEARNING RESOURCES AND BIBLIOGRAPHY				
Learning resources	Bibliography			
Subject notes	Halevi, G. (2003). Process and Operation Planning : Revised Edition of the Principles of Process Planning: a Logical Approach. Springer			
Labs Moodle Platform Lab practical training	Netherlands.			
	Scallan, P. (2003). Process Planning: The Design/Manufacture Interface. Elsevier			
Class presentations Specific Master Software	Kalpakjian, S., & Schmid, S. R. (2002). Manufactura, ingeniería y tecnología. Pearson educación.			
	Grover, M. P. (1997). Fundamentos de Manufactura Moderna. Materiales, Procesos y Sistemas.			