

Course: 2024 / 2025 - Course planning



[GMA304] MATHEMATICS III							
GENERAL INFORMATION							
Studies DEGREE IN MEC	HANICAL ENGINEERING	Subject	MATHEMATIC	S			
Semester 1	Course 2	Mention / Field of					
Character BASIC TRAINING		specialisation					
<b>Plan</b> 2022	Modality Face-to-face	Language	EUSKARA/CA	STELL	ANO		
Credits 6	Hours/week 4.33	Total hours	78 class hours hours	+ 72 n	on-clas	s hours :	= <u>150 total</u>
	2030 AGENI	DA GOALS					
B description and the second and the							
	PROFES	SORS					
LIZARRIBAR MORAIZ, JATS	U						
URIEN CRESPO, MIREN JOS	SUNE						
ZUBIRIA ULACIA, MARIA							
	REQUIRED PREVIC		GE				
(No specific provious	CIS	//	Know			red)	
			NO PIEVIOUS KIIO	meuge	erequii	eu)	
LEARNING RESULTS	LEARNING	RESULIS		кс	SK	AB	ECTS
GMR201 - To solve mathematical pro	blems that may arise in engineerin	ig. Ability to apply kn	owledge	-		x	5,4
about: differential and integral calcul	us of several variables; vector calc	ulus and of gradual comm	alexity -		¥		0.36
becoming aware of respect for huma	an rights and fundamental rights, ar	nd analyzing and ass	essing the				0,00
impact of the proposed solutions on	the SDGs - to acquire and/or apply	basic, advanced an	d/or				
avant-garde, demonstrating the abili with a high degree of autonomy	ty to work in multidisciplinary teams	s and/or undertake fu	inther studies				
G-RTR2 - To express information, ide	<b>G-RTR2</b> - To express information, ideas and the arguments that support them in an orderly, clear and <b>x</b> 0,24						0,24
coherent manner, orally and in writing, based on quality information, self-made or obtained from different							
sources, using inclusive and non-discriminatory language							
KC: Knowledge or Content / SK: Skills / AB: A	Abilities					Total:	6
ENA101 - Knowledge and comprehension: Knowledge and understanding of mathematics and other basic sciences inherent in them							
engineering speciality, at a level that allows them to acquire the other competencies of the degree.							
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.							
<b>ENA106</b> - 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.							
<b>ENA111</b> - 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.							
<b>ENA112</b> - 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.							
ENA118 - Preparation of judgements: Ability to manage complex technical or professional activities or projects of their speciality, taking responsibility for decision making.							
ENAMO Communication and Terr	work. Ability to offectively	vionto information			utione :	امثار مطلوم	-l - f

**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.

## SECONDARY LEARNING RESULTS

1RGM290 (1 sem)			
LEARNING ACTIVITIES	СН	NCH	тн
Development and writing of records, reports, presentations, audiovisual material, etc. on projects/work experience/challenges/case studies/experimental investigations carried out		3 h.	3 h.





individually and/or in teams					
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 <b>Comments:</b> Continuous evaluation. FEEDBACK received tutor and the experts in the project follow-up meetings	100%	(No mechanisms) <b>Comments:</b> Continuous evaluation. FEEDBACK received from tutor and the experts in the project follow-up meetings			received from the ngs
CH - Class hours: 0 h. NCH - Non-class hours: 3 h.					
IH - Total nours: 3 n.					
1RGM293 (1 sem)					
LEARNING ACTIVITIES			СН	NCH	тн
Development and writing of records, reports, presentation	s, audiovis	sual material, etc. on	-	3 h.	3 h.
individually and/or in teams		Sugations carried out			
EVALUATION SYSTEM	W	MAKE-UP MECHANIS	SMS		
Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory	100%	Comments: Continuo	(No mech	anisms) DEEDBACK	received from the
exercises, term projects, challenges and problems		tutor and the experts in	the project for	ollow-up meeti	ngs
<b>Comments:</b> Continuous evaluation. FEEDBACK received	from the				
NCH - Class nours: 0 n. NCH - Non-class hours: 3 h.					
TH - Total hours: 3 h.					
1RCM294 (1 sem)					
INGM264 (1 Sell)					
			<u></u>		
LEARNING ACTIVITIES Development and writing of records, reports, presentation	s audiovis	ual material etc. on	СН	3 h.	3 h.
projects/work experience/challenges/case studies/experin individually and/or in teams	nental inve	stigations carried out			
	w		SMS		
Presentation and defence of exercises, case studies.	100%	WARE-OF WECHANK	(No mech	anisms)	
computer practical work, simulation practical work,		Comments: Continuou	us evaluation	n. FEEDBACK	received from the
laboratory practical work, term projects, end of degree project master's thesis challenges and problems		tutor and the experts in	the project for	ollow-up meeti	ngs
<b>Comments:</b> Continuous evaluation. FEEDBACK received	from the				
utor and the experts in the project follow-up meetings					
CH - Class hours: 0 h.					
NCH - Non-class hours: 3 h. TH - Total hours: 3 h.					
REM202 [!] Utiliza el cálculo integral para funciones r	nultivarial	bles en la resolución de	problemas	geométricos	y físicos
LEARNING ACTIVITIES			СН	NCH	тн



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	Carrying out/resolving projects/challenges/cases, etc. to provide solutions to problems in				
interdisciplinary contexts, real and/or simulated, individually and/or in teams Computer simulation exercises, individually and/or in teams			4 h.	4 h.	8 h.
Presentation by the teacher in the classroom, in participatory classes, of concepts and			9 h.		9 h.
procedures associated with the subjects					
Carrying out exercises and solving problems individually	and/or in te	eams	8 h.	13 h.	21 h.
EVALUATION SYSTEM	20%	MAKE-UP MECHAN	ISMS	onieme)	
computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems	2070		(NO Mech	anisins)	
Individual written and/or oral tests or individual coding/programming tests	80%				
CH - Class hours: 30 h. NCH - Non-class hours: 20 h. TH - Total hours: 50 h.					
RGM203 [!] Desarrolla e interpreta series de Fourier	de funcior	es periódicas v no per	iódicas		
,					
LEARNING ACTIVITIES	ana taking	avaminationa and/ar dai	CH	2 h	
checkpoints	ces, taking	examinations and/or doi	ng 211.	2 11.	4 11.
Presentation by the teacher in the classroom, in participa	atory classe	s, of concepts and	3 h.		3 h.
Carrying out exercises and solving problems individually	and/or in te	ams	3 h.	5 h.	8 h.
EVALUATION SYSTEM	W	MAKE-UP MECHAN	SMS		
Individual written and/or oral tests or individual	100%		(No mech	anisms)	
coding/programming tests					
CH - Class hours: 8 h.					
NCH - Non-class hours: 7 h.					
NCH - Non-class hours: 7 h. TH - Total hours: 15 h.					
NCH - Non-class hours: 7 h. TH - Total hours: 15 h.					
NCH - Non-class hours: 7 h. TH - Total hours: 15 h.					
NCH - Non-class hours: 7 h. TH - Total hours: 15 h.					
NCH - Non-class hours: 7 h. TH - Total hours: 15 h. IRGM292 (1 sem)					
NCH - Non-class hours: 7 h. TH - Total hours: 15 h. IRGM292 (1 sem)					
NCH - Non-class hours: 7 h. TH - Total hours: 15 h. IRGM292 (1 sem) LEARNING ACTIVITIES			СН	NCH	ТН
NCH - Non-class hours: 7 h. TH - Total hours: 15 h. IRGM292 (1 sem) LEARNING ACTIVITIES Development and writing of records, reports, presentation projects/work experience/challenges/case studies/experiention individually and/or in teams	ns, audiovis mental inve	sual material, etc. on stigations carried out	СН	<u>NCH</u> 3 h.	<u>ТН</u> 3 h.
NCH - Non-class hours: 7 h. TH - Total hours: 15 h. IRGM292 (1 sem) LEARNING ACTIVITIES Development and writing of records, reports, presentation projects/work experience/challenges/case studies/experient individually and/or in teams EVALUATION SYSTEM	ns, audiovis mental inve W	sual material, etc. on estigations carried out	сн	<u>NCH</u> 3 h.	<u>ТН</u> 3 h.
NCH - Non-class hours: 7 h. TH - Total hours: 15 h. IRGM292 (1 sem) LEARNING ACTIVITIES Development and writing of records, reports, presentation projects/work experience/challenges/case studies/experiendividually and/or in teams EVALUATION SYSTEM Self-assessment	ns, audiovis mental inve <u>w</u> 100%	sual material, etc. on estigations carried out	CH ISMS (No mech	NCH 3 h. anisms)	<u>ТН</u> 3 h.
NCH - Non-class hours: 7 h. TH - Total hours: 15 h. IRGM292 (1 sem) LEARNING ACTIVITIES Development and writing of records, reports, presentation projects/work experience/challenges/case studies/experi individually and/or in teams EVALUATION SYSTEM Self-assessment Comments: Continuous evaluation. FEEDBACK receive	ns, audiovis mental inve <u>w</u> 100% d from the	sual material, etc. on estigations carried out <u>MAKE-UP MECHAN</u> Comments: Continuc	CH SMS (No mech bus evaluation	NCH 3 h. anisms) n. FEEDBACK	TH 3 h. received from th
NCH - Non-class hours: 7 h.         TH - Total hours: 15 h.         IRGM292 (1 sem)         LEARNING ACTIVITIES         Development and writing of records, reports, presentation projects/work experience/challenges/case studies/experientindividually and/or in teams         EVALUATION SYSTEM         Self-assessment         Comments: Continuous evaluation. FEEDBACK received tutor and the experts in the project follow-up meetings	ns, audiovis mental inve <u>W</u> 100% d from the	sual material, etc. on estigations carried out <u>MAKE-UP MECHAN</u> Comments: Continuc tutor and the experts in	Сн SMS (No mech bus evaluation the project fe	NCH 3 h. anisms) h. FEEDBACK bllow-up meeti	TH 3 h. received from th
NCH - Non-class hours: 7 h. TH - Total hours: 15 h. IRGM292 (1 sem) LEARNING ACTIVITIES Development and writing of records, reports, presentation projects/work experience/challenges/case studies/experient individually and/or in teams EVALUATION SYSTEM Self-assessment Comments: Continuous evaluation. FEEDBACK received tutor and the experts in the project follow-up meetings	ns, audiovis mental inve <u>w</u> 100% d from the	sual material, etc. on estigations carried out <u>MAKE-UP MECHAN</u> Comments: Continuc tutor and the experts in	CH SMS (No mech- pus evaluation the project for	NCH 3 h. anisms) h. FEEDBACK ollow-up meeti	TH 3 h. received from th
NCH - Non-class hours: 7 h. TH - Total hours: 15 h. IRGM292 (1 sem) LEARNING ACTIVITIES Development and writing of records, reports, presentation projects/work experience/challenges/case studies/experi individually and/or in teams EVALUATION SYSTEM Self-assessment Comments: Continuous evaluation. FEEDBACK receive tutor and the experts in the project follow-up meetings CH - Class hours: 0 h.	ns, audiovis mental inve <u>w</u> 100% d from the	sual material, etc. on estigations carried out <u>MAKE-UP MECHAN</u> Comments: Continuc tutor and the experts in	CH SMS (No mech bus evaluation the project for	NCH 3 h. anisms) h. FEEDBACK billow-up meeti	TH 3 h. received from th
NCH - Non-class hours: 7 h. TH - Total hours: 15 h. IRGM292 (1 sem) LEARNING ACTIVITIES Development and writing of records, reports, presentation projects/work experience/challenges/case studies/experi individually and/or in teams EVALUATION SYSTEM Self-assessment Comments: Continuous evaluation. FEEDBACK receive tutor and the experts in the project follow-up meetings CH - Class hours: 0 h. NCH - Non-class hours: 3 h. TH - Total hours: 3 h.	ns, audiovis mental inve <u>W</u> 100% d from the	sual material, etc. on estigations carried out <u>MAKE-UP MECHAN</u> Comments: Continuc tutor and the experts in	CH SMS (No mech pus evaluation the project for	NCH 3 h. anisms) h. FEEDBACK bllow-up meeti	TH 3 h. received from th
NCH - Non-class hours: 7 h. TH - Total hours: 15 h. IRGM292 (1 sem) LEARNING ACTIVITIES Development and writing of records, reports, presentation projects/work experience/challenges/case studies/experi individually and/or in teams EVALUATION SYSTEM Self-assessment Comments: Continuous evaluation. FEEDBACK receive tutor and the experts in the project follow-up meetings CH - Class hours: 0 h. NCH - Non-class hours: 3 h. TH - Total hours: 3 h.	ns, audiovis mental inve <u>w</u> 100% d from the	sual material, etc. on estigations carried out <u>MAKE-UP MECHAN</u> Comments: Continuc tutor and the experts in	CH SMS (No mech bus evaluation the project for	NCH 3 h. anisms) h. FEEDBACK ollow-up meeti	TH 3 h. received from th ngs
NCH - Non-class hours: 7 h. TH - Total hours: 15 h. IRGM292 (1 sem) LEARNING ACTIVITIES Development and writing of records, reports, presentation projects/work experience/challenges/case studies/experient individually and/or in teams EVALUATION SYSTEM Self-assessment Comments: Continuous evaluation. FEEDBACK received tutor and the experts in the project follow-up meetings CH - Class hours: 0 h. NCH - Non-class hours: 3 h. TH - Total hours: 3 h.	ns, audiovis mental inve <u>w</u> 100% d from the	sual material, etc. on estigations carried out <u>MAKE-UP MECHAN</u> Comments: Continuc tutor and the experts in	CH SMS (No mech bus evaluation the project for	NCH 3 h. anisms) h. FEEDBACK ollow-up meeti	TH 3 h. received from th ngs
NCH - Non-class hours: 7 h. TH - Total hours: 15 h. IRGM292 (1 sem) LEARNING ACTIVITIES Development and writing of records, reports, presentation projects/work experience/challenges/case studies/experi individually and/or in teams EVALUATION SYSTEM Self-assessment Comments: Continuous evaluation. FEEDBACK receive tutor and the experts in the project follow-up meetings CH - Class hours: 0 h. NCH - Non-class hours: 3 h. TH - Total hours: 3 h.	ns, audiovis mental inve <u>W</u> 100% d from the	sual material, etc. on estigations carried out <u>MAKE-UP MECHAN</u> Comments: Continue tutor and the experts in	CH SMS (No mech bus evaluation the project for	NCH 3 h. anisms) h. FEEDBACK billow-up meeti	TH 3 h. received from th ngs
NCH - Non-class hours: 7 h. TH - Total hours: 15 h. IRGM292 (1 sem) LEARNING ACTIVITIES Development and writing of records, reports, presentation projects/work experience/challenges/case studies/experi individually and/or in teams EVALUATION SYSTEM Self-assessment Comments: Continuous evaluation. FEEDBACK receive tutor and the experts in the project follow-up meetings CH - Class hours: 0 h. NCH - Non-class hours: 3 h. TH - Total hours: 3 h.	ns, audiovis mental inve <u>w</u> 100% d from the	sual material, etc. on estigations carried out <u>MAKE-UP MECHAN</u> Comments: Continuc tutor and the experts in	CH ISMS (No mech bus evaluation the project for	NCH 3 h. anisms) h. FEEDBACK billow-up meeti	TH 3 h.
NCH - Non-class hours: 7 h. TH - Total hours: 15 h. IRGM292 (1 sem) LEARNING ACTIVITIES Development and writing of records, reports, presentation projects/work experience/challenges/case studies/experie individually and/or in teams EVALUATION SYSTEM Self-assessment Comments: Continuous evaluation. FEEDBACK receive tutor and the experts in the project follow-up meetings CH - Class hours: 0 h. NCH - Non-class hours: 3 h. TH - Total hours: 3 h. IRGM291 (1 sem)	ns, audiovis mental inve <u>w</u> 100% d from the	sual material, etc. on estigations carried out <u>MAKE-UP MECHAN</u> Comments: Continuc tutor and the experts in	CH SMS (No mech bus evaluation the project for	NCH 3 h. anisms) n. FEEDBACK ollow-up meeti	TH 3 h.



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			Escuela Pol Superior
LEARNING ACTIVITIES	СН	NCH	ТН
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	t	3 h.	3 h.
EVALUATION SYSTEM W MAKE-UP MECH	ANISMS		
Self-assessment 100%	(No mech	anisms)	
Comments: Continuous evaluation. FEEDBACK received from the tutor and the experts in the project follow-up meetings tutor and the expert	inuous evaluation ts in the project for	n. FEEDBACk ollow-up meet	received fror ings
H - Class hours: 0 h. CH - Non-class hours: 3 h. H - Total hours: 3 h.			
RGM204 [!] Utiliza el cálculo vectorial en la resolución de problemas geométricos	y físicos		
LEARNING ACTIVITIES	СН	NCH	ТН
Presentation by the teacher in the classroom, in participatory classes, of concepts and	10 h.	10 h.	20 h.
procedures associated with the subjects			
EVALUATION SYSTEM MAKE-UP MECH	ANISMS		
Individual written and/or oral tests or individual 100%	(No mech	anisms)	
H - Class hours: 10 h. CH - Non-class hours: 10 h. I - Total hours: 20 h.			
H - Class hours: 10 h. ICH - Non-class hours: 10 h. H - Total hours: 20 h.			
H - Class hours: 10 h. CH - Non-class hours: 10 h. H - Total hours: 20 h. RGM201 [!] Utiliza el cálculo diferencial multivariable para optimización de funcion plicaciones	nes, estimación	n de errores y	otras
H - Class hours: 10 h. CH - Non-class hours: 10 h. H - Total hours: 20 h.	nes, estimación	n de errores y	otras
H - Class hours: 10 h. CH - Non-class hours: 10 h. H - Total hours: 20 h. RGM201 [!] Utiliza el cálculo diferencial multivariable para optimización de funcion plicaciones LEARNING ACTIVITIES Conducting teste, giving prosportations, prosporting defenses, taking examinations and/or	nes, estimación CH	n de errores y NCH	otras TH
H - Class hours: 10 h. CH - Non-class hours: 10 h. H - Total hours: 20 h. RGM201 [!] Utiliza el cálculo diferencial multivariable para optimización de funcion blicaciones LEARNING ACTIVITIES Conducting tests, giving presentations, presenting defences, taking examinations and/or checkpoints	nes, estimación CH doing <sup>4 h.</sup>	n de errores y NCH	otras TH 4 h.
H - Class hours: 10 h. CH - Non-class hours: 10 h. 1 - Total hours: 20 h. CGM201 [!] Utiliza el cálculo diferencial multivariable para optimización de funcio Dicaciones LEARNING ACTIVITIES Conducting tests, giving presentations, presenting defences, taking examinations and/or checkpoints Carrying out/resolving projects/challenges/cases, etc. to provide solutions to problems in nterdisciplinary contexts, real and/or simulated, individually and/or in teams	nes, estimación <u>CH</u> doing <sup>4</sup> h. 5 h.	a de errores y NCH 3 h.	<i>t</i> otras TH 4 h. 8 h.
H - Class hours: 10 h. CH - Non-class hours: 10 h. 1 - Total hours: 20 h. CGM201 [!] Utiliza el cálculo diferencial multivariable para optimización de funcio blicaciones LEARNING ACTIVITIES Conducting tests, giving presentations, presenting defences, taking examinations and/or checkpoints Carrying out/resolving projects/challenges/cases, etc. to provide solutions to problems in nterdisciplinary contexts, real and/or simulated, individually and/or in teams Computer simulation exercises, individually and/or in teams	nes, estimación CH doing 4 h. 5 h. 4 h.	n de errores y NCH 3 h. 4 h.	<i>TH</i> 4 h. 8 h. 8 h.
H - Class hours: 10 h. CH - Non-class hours: 10 h. I - Total hours: 20 h. RGM201 [!] Utiliza el cálculo diferencial multivariable para optimización de funcio blicaciones LEARNING ACTIVITIES Conducting tests, giving presentations, presenting defences, taking examinations and/or checkpoints Carrying out/resolving projects/challenges/cases, etc. to provide solutions to problems in nterdisciplinary contexts, real and/or simulated, individually and/or in teams Computer simulation exercises, individually and/or in teams Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects	nes, estimación CH doing 4 h. 5 h. 4 h. 9 h.	a de errores y NCH 3 h. 4 h.	TH 4 h. 8 h. 8 h. 9 h.
H - Class hours: 10 h. CH - Non-class hours: 10 h. I - Total hours: 20 h. CGM201 [!] Utiliza el cálculo diferencial multivariable para optimización de funcio blicaciones LEARNING ACTIVITIES Conducting tests, giving presentations, presenting defences, taking examinations and/or checkpoints Carrying out/resolving projects/challenges/cases, etc. to provide solutions to problems in nterdisciplinary contexts, real and/or simulated, individually and/or in teams Computer simulation exercises, individually and/or in teams Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects Carrying out exercises and solving problems individually and/or in teams Comments: The simulation exercises are carried out using the latest version of MATLAB	nes, estimación CH doing 4 h. 5 h. 4 h. 9 h. 8 h. 8 software.	а <b>de errores y</b> <u>NCH</u> 3 h. 4 h. 13 h.	<b>TH</b> 4 h. 8 h. 9 h. 21 h.
H - Class hours: 10 h. CH - Non-class hours: 10 h. 1 - Total hours: 20 h. CGM201 [!] Utiliza el cálculo diferencial multivariable para optimización de funcio oblicaciones LEARNING ACTIVITIES Conducting tests, giving presentations, presenting defences, taking examinations and/or checkpoints Carrying out/resolving projects/challenges/cases, etc. to provide solutions to problems in nterdisciplinary contexts, real and/or simulated, individually and/or in teams Computer simulation exercises, individually and/or in teams Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects Carrying out exercises and solving problems individually and/or in teams Comments: The simulation exercises are carried out using the latest version of MATLAB EVALUATION SYSTEM W MAKE-UP MECH	nes, estimación CH doing 4 h. 5 h. 4 h. 9 h. 8 h. 8 software. ANISMS	n de errores y NCH 3 h. 4 h. 13 h.	otras           TH           4 h.           8 h.           9 h.           21 h.
H - Class hours: 10 h.         CH - Non-class hours: 10 h.         H - Total hours: 20 h.         RGM201 [I] Utiliza el cálculo diferencial multivariable para optimización de funcio.         plicaciones         LEARNING ACTIVITIES         Conducting tests, giving presentations, presenting defences, taking examinations and/or checkpoints         Carrying out/resolving projects/challenges/cases, etc. to provide solutions to problems in interdisciplinary contexts, real and/or simulated, individually and/or in teams         Computer simulation exercises, individually and/or in teams         Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects         Carrying out exercises and solving problems individually and/or in teams         Comments: The simulation exercises are carried out using the latest version of MATLAB         EVALUATION SYSTEM       W         Reports on the completion of exercises, case studies, 20%	nes, estimación CH doing 4 h. 5 h. 4 h. 9 h. 8 h. 3 software. ANISMS (No mech	n de errores y NCH 3 h. 4 h. 13 h.	<b>otras</b> <u>TH</u> 4 h. 8 h. 9 h. 21 h.
H - Class hours: 10 h.         CH - Non-class hours: 10 h.         H - Total hours: 20 h.         RGM201 [1] Utiliza el cálculo diferencial multivariable para optimización de funcio plicaciones         LEARNING ACTIVITIES         Conducting tests, giving presentations, presenting defences, taking examinations and/or checkpoints         Carrying out/resolving projects/challenges/cases, etc. to provide solutions to problems in interdisciplinary contexts, real and/or simulated, individually and/or in teams         Computer simulation exercises, individually and/or in teams         Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects         Carrying out exercises and solving problems individually and/or in teams         Comments: The simulation exercises, case studies, computer exercises, simulation exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems       20%         MAKE-UP MECH.         Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems       20%         Individual written and/or oral tests or individual       80%	nes, estimación CH doing 4 h. 5 h. 4 h. 9 h. 8 h. 3 software. ANISMS (No mech	n de errores y NCH 3 h. 4 h. 13 h. anisms)	<b>otras</b> <b>TH</b> 4 h. 8 h. 9 h. 21 h.
H - Class hours: 10 h.         CH - Non-class hours: 20 h.         RGM201 [!] Utiliza el cálculo diferencial multivariable para optimización de funcio plicaciones         LEARNING ACTIVITIES         Conducting tests, giving presentations, presenting defences, taking examinations and/or checkpoints         Carrying out/resolving projects/challenges/cases, etc. to provide solutions to problems in interdisciplinary contexts, real and/or simulated, individually and/or in teams         Computer simulation exercises, individually and/or in teams         Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects         Carrying out exercises and solving problems individually and/or in teams         Comments: The simulation exercises, reac carried out using the latest version of MATLAE         EVALUATION SYSTEM       W         Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems       20%         Individual written and/or oral tests or individual       80%	nes, estimación CH doing 4 h. 5 h. 4 h. 9 h. 8 h. 8 software. ANISMS (No mech	n de errores y NCH 3 h. 4 h. 13 h. anisms)	otras TH 4 h. 8 h. 9 h. 21 h.
H - Class hours: 10 h.         H - Total hours: 20 h.         RGM201 [1] Utiliza el cálculo diferencial multivariable para optimización de funcio plicaciones         LEARNING ACTIVITIES         Conducting tests, giving presentations, presenting defences, taking examinations and/or checkpoints         Carrying out/resolving projects/challenges/cases, etc. to provide solutions to problems in interdisciplinary contexts, real and/or simulated, individually and/or in teams         Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects         Carrying out exercises and solving problems individually and/or in teams         Computer simulation exercises, case studies, computer simulation exercises, accuried out using the latest version of MATLAE         EVALUATION SYSTEM       W         Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems       80%         Individual written and/or oral tests or individual       80%         H - Class hours: 30 h.       6H - Non-class hours: 20 h	nes, estimación CH doing 4 h. 5 h. 4 h. 9 h. 8 h. 3 software. ANISMS (No mech	n de errores y NCH 3 h. 4 h. 13 h.	otras TH 4 h. 8 h. 9 h. 21 h.
H - Class hours: 10 h.         CH - Non-class hours: 10 h.         H - Total hours: 20 h.         REGM201 [1] Utiliza el cálculo diferencial multivariable para optimización de funcio oficaciones         LEARNING ACTIVITIES         Conducting tests, giving presentations, presenting defences, taking examinations and/or checkpoints         Carrying out/resolving projects/challenges/cases, etc. to provide solutions to problems in interdisciplinary contexts, real and/or simulated, individually and/or in teams         Computer simulation exercises, individually and/or in teams         Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects         Carrying out exercises and solving problems individually and/or in teams         Comments: The simulation exercises, case studies, 20%         Computer exercises, simulation exercises, laboratory axercises, term projects, challenges and problems individual witten and/or or al tests or individual witten and/or oral tests or individual withe and/or or al tests or ind	nes, estimación CH doing 4 h. 5 h. 4 h. 9 h. 8 h. 3 software. ANISMS (No mech	a de errores y NCH 3 h. 4 h. 13 h.	otras         TH         4 h.         8 h.         9 h.         21 h.
H - Class hours: 10 h.         H - Total hours: 20 h.         REMEDIT [I] Utiliza el cálculo diferencial multivariable para optimización de funcio oblicaciones         LEARNING ACTIVITIES         Conducting tests, giving presentations, presenting defences, taking examinations and/or checkpoints         Carrying out/resolving projects/challenges/cases, etc. to provide solutions to problems in interdisciplinary contexts, real and/or simulated, individually and/or in teams         Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects         Carrying out exercises and solving problems individually and/or in teams         Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects         Carrying out exercises and solving problems individually and/or in teams         Computer simulation exercises, case studies, 20%         Computer exercises, simulation exercises, laboratory         exercises, term projects, challenges and problems         Individual written and/or oral tests or individual       80%         coding/programming tests         H - Class hours: 30 h.         CH - Non-class hours: 20 h.         1 - Total hours: 50 h.	nes, estimación CH doing 4 h. 5 h. 4 h. 9 h. 8 h. 3 software. ANISMS (No mech	n de errores y NCH 3 h. 4 h. 13 h.	<b>otras</b> <b>TH</b> 4 h. 8 h. 9 h. 21 h.

1) Multivariable functions





- Domain of multivariable functions
- Limits of multivariable functions
- Partial derivatives
- Local maxima and minima
- Absolute maxima and minima in closed domains
- Diferential approximation
- Optimization problems
- Gradient. Directional derivatives
- Tangent planes
- 2) Multivariable integrals
  - Doble integrals. Computation of volumes and areas
  - Integrales triples. Computation of volumes and center of mass
- 3) Fourier series
  - Gibbs phenomenon
- 4) Multivariable vector functions
  - Conservative fields
  - Green's theorem

## LEARNING RESOURCES AND BIBLIOGRAPHY

Learning resources	Bibliography
Subject notes	Calculus (Volumen II) Salas/Hille/Etgen Ed.Reverté
Moodle Platform	Cálculo de varias variables (volumen 2) Gerald Bradley Karl J.
Class presentations	Smith Ed Prentice Hall
Specific Master Software	