Goi Eskola Politeknikoa Escuela Politécnica Superior

		[GFC00	bj Quar	itum Physics					
		GEN	IERAL INI	ORMATION					
Studies	ENGINEERING INDUSTRY	PHYSICS APPLIED TO)	Subject	Physics				
Semester	2	Course 2		Mention / Field of					
Character	COMPULSORY			specialisation					
Plan	2022	Modality Fac	ce-to-face	Language	EUSKARA/CA	STELL	ANO		
Credits	4,5	Hours/week 0		l otal hours	68 class hours	8 + 44.5	non-cl	ass houi	'S = <u>112.5 to</u>
		203	30 AGENI	DA GOALS					
SENT WORK AND MODE GROWTH MODE GROWTH MOD MOD GROWTH MODE GROWTH M									
			PROFES	SORS					
TELLERIA	ALLIKA, XABIER								
LASA ALOI	NSO, JON								
		REQUIRE	D PREVIC	US KNOWLED	GE				
	Subj	ects			Knov	vledge			
(No	o specific previou	s subjects required)		()	lo previous kno	owledge	e requii	red)	
		LE	EARNING	RESULTS					
EARNING RESU	JLTS	les of quantum physics	and solving	simple problems in (one and three	KC	SK	AB	4 02
imensions			and solving			~			1,02
-RTR1 - To deve ecoming aware of	lop interdisciplina of respect for hun	ry projects specific to th nan rights and fundament the SDCs, to acquire	neir specialty ntal rights, ar	and of gradual comp nd analyzing and ass basic, advanced an	blexity, - essing the d/or		x		0,24
npact of the prop vant-garde, dem	onstrating the ab	ility to work in multidisci	plinary team	s and/or undertake fu	urther studies				
npact of the prop vant-garde, dem vith a high degree h-RTR2 - To expre oherent manner, ources, using inc	oosed solutions of onstrating the ab e of autonomy ess information, ic orally and in writ clusive and non-d	lity to work in multidiscip deas and the arguments ing, based on quality inf iscriminatory language	s that suppor	t them in an orderly, If-made or obtained	rther studies clear and from different		x		0,24
npact of the prop vant-garde, dem vith a high degree G-RTR2 - To expre oherent manner, ources, using inc	oosed solutions of onstrating the ab e of autonomy ess information, ic orally and in writ clusive and non-d ntent / SK: Skills / AB	ility to work in multidiscip deas and the arguments ing, based on quality inf iscriminatory language Abilities	s that suppor formation, se	s and/or undertake fu t them in an orderly, If-made or obtained	In the studies clear and from different		x	Total:	0,24 4,5
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Course: 2024 / 2025 - Course planning

Unibertsitatea Goi Eskola Politeknikoa Escuela Politécnica Superior

Carrying out/resolving projects/challenges/cases, etc. to p interdisciplinary contexts, real and/or simulated, individua	lutions to problems in 1 h. 1 h. 2 h. in teams	
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	100%	(No mechanisms)
CH - Class hours: 1 h. NCH - Non-class hours: 1 h. TH - Total hours: 2 h.		

RGF219 [!] Entiende las limitaciones de la mecánica clásica para explicar la física del mundo microscópico. СН NCH ΤН LEARNING ACTIVITIES 10 h. Carrying out/resolving projects/challenges/cases, etc. to provide solutions to problems in 6 h. 4 h. interdisciplinary contexts, real and/or simulated, individually and/or in teams 13 h. 8 h. 21 h. 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 9 h. 5 h. 14 h. Practical work in workshops and/or laboratories, individually and/or in teams 3 h. 2 h. 5 h. **EVALUATION SYSTEM** w MAKE-UP MECHANISMS Reports on the completion of exercises, case studies, 10% Individual written and/or oral tests or individual computer exercises, simulation exercises, laboratory coding/programming tests exercises, term projects, challenges and problems Presentation and defence of exercises, case studies, 20% computer practical work, simulation practical work, laboratory practical work, term projects, end of degree project, master's thesis, challenges and problems 70% Individual written and/or oral tests or individual coding/programming tests CH - Class hours: 31 h. NCH - Non-class hours: 19 h. TH - Total hours: 50 h.

2RGF291 (2 sem)					
LEARNING ACTIVITIES			СН	NCH	тн
Carrying out/resolving projects/challenges/cases, etc. to p interdisciplinary contexts, real and/or simulated, individua	orovide sol Ily and/or i w	utions to problems in n teams	2 h.	1 h.	3 h.
Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems	100%		(No mech	anisms)	
CH - Class hours: 2 h. NCH - Non-class hours: 1 h. TH - Total hours: 3 h.					

2RGF290 (2 sem)

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LEARNING ACTIVITIES			СН	NCH	ТН
Carrying out/resolving projects/challenges/cases, etc. to printerdisciplinary contexts, real and/or simulated, individual	rovide solu ly and/or in	utions to problems in n teams	1 h.	2 h.	3 h.
EVALUATION SYSTEM	W	MAKE-UP MECHANI	SMS		
Self-assessment	25%		(No mecha	anisms)	
Co-assessment	25%				
Observation (technical capacity, attitude and participation)	50%				
CH - Class hours: 1 h. NCH - Non-class hours: 2 h. TH - Total hours: 3 h.					
2RGF292 (2 sem)					
LEARNING ACTIVITIES			СН	NCH	ТН
Development and writing of records, reports, presentations projects/work experience/challenges/case studies/experim individually and/or in teams	s, audiovis iental inve	sual material, etc. on stigations carried out	1 h.	1 h.	2 h.
EVALUATION SYSTEM	W	MAKE-UP MECHANI	SMS		
computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems			(100 110012	111011107	
CH - Class hours: 1 h. NCH - Non-class hours: 1 h. TH - Total hours: 2 h.					
RGF220 [!] Resuelve la ecuación de Schrödinger de m LEARNING ACTIVITIES Carruing out/resolving projects/challenges/cases, etc. to pi	nanera an	alítica para modelos se	ncillos de un CH 6 h.	na y tres dim NCH 4 h.	ensiones TH 10 h.
interdisciplinary contexts, real and/or simulated, individual	ly and/or in	n teams			
Presentation by the teacher in the classroom, in participate procedures associated with the subjects	ory classe	s, of concepts and	19 h.	13 h.	32 h.
Carrying out exercises and solving problems individually a	nd/or in te	ams	3 h.	1 h.	4 h.
Practical work in workshops and/or laboratories, individual	ly and/or i	n teams	2,5 h.	2 h.	4,5 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	10%	Individual written and/or oral tests or individual coding/programming tests			
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	20%				

CH - Class hours: 30,5 h. NCH - Non-class hours: 20 h.

coding/programming tests

Individual written and/or oral tests or individual

TH - Total hours: 50,5 h.

CONTENTS

70%



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Course: 2024 / 2025 - Course planning

1. Need for a quantum theory

- 1. Black body radiation, photoelectric effect, atomic spectra, Bohr model, and double slit experiment
- 2. Introduction to the quantum theory
 - 1. De Broglie postulate
 - 2. Wave function and the statistical interpretation
 - 3. The Schrödinger equation, superposition principle and the free particle
 - 4. Operators, obsevables and Heisenberg's uncertainty principle
 - 5. Permanent and non-permanent states
 - 6. Measurement results and their probabilities
- 3. Formalism of the quantum theory
 - 1. Postulates of quantum mechanics
 - 2. Commutators, compatible observables, and full group of commutable observables
 - 3. Uncertainty principle
 - 4. Time evolution of obsevables. Ehrenfest and Virial's theorems
 - 5. Time independent Schrödinger equation
- 4. One dimensional potentials
- 1. Infinite potential well, potential jump, potential wall, finite potential well, Dirac's delta potential and harmonic oscillator 5. Three dimensional potentials
- 1. Free particle, square potential well, harmonic oscillator and hydrogen atom
- 6. Numerical solution of the Schrödinger equation

LEARNING RESOURCES AND BIBLIOGRAPHY

Learning resourcesBibliographySubject noteshttps://labur.eus/UvEY5Moodle PlatformClass presentationsSlides of the subjectLabs