



IDENTIFYING DATA

Fundamentals of Electronics

Subject	Fundamentals of Electronics			
Code	V12G330V01402			
Study programme	(*)Grao en Enxeñaría en Electrónica Industrial e Automática			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Mandatory	2nd	2nd
Teaching language	Spanish Galician English			
Department				
Coordinator	Eguizábal Gándara, Luis Eduardo Martínez-Peñalver Freire, Carlos			
Lecturers	Baneira Collazo, Fernando Eguizábal Gándara, Luis Eduardo Lago Ferreiro, Alfonso Martínez-Peñalver Freire, Carlos Pérez Estévez, Diego Rodríguez Castro, Francisco Sánchez Real, Francisco Javier			
E-mail	penalver@uvigo.es eguizaba@uvigo.es			
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General description	This *assignatura pretends to provide to the *alumnado a basic training, so much theoretical how practical, on the fundamental concepts of the analog electronics.			

Competencies

Code	
B3	CG3 Knowledge in basic and technological subjects that will enable students to learn new methods and theories, and provide them the versatility to adapt to new situations.
C11	CE11 Knowledge of the fundamentals of electronics.
D2	CT2 Problems resolution.
D9	CT9 Apply knowledge.
D10	CT10 Self learning and work.

Learning outcomes

Expected results from this subject	Training and Learning Results		
Understand the appearances related with the interconnection of basic devices	B3	C11	D2 D9
Understand the operation of the basic electronic devices	B3	C11	D2 D9
Analyse discreet circuits			D2 D9 D10
Analyse and design circuits amplifiers			D2 D9 D10
Use basic electronic instrumentation			D9 D10

Know and dominate the tools of simulation of devices	B3	D2 D9 D10
Check the operation of the electronic circuits		D9 D10

Contents

Topic	
Subject 1. Physics of devices.	Fundamental concepts. Introduction to physics of the solid state. Union *PN: balance, direct polarisation, reverse polarisation. Differences between ideal diode and real diode. Models of the diode. I handle of the characteristic leaves. Types of diodes.
Subject 2. Circuits with diodes.	Circuit *recortador. Circuit *limitador. Circuit *rectificador. Filter by condenser. Detection of failures.
Subject 3. Transistors.	Bipolar transistor (*BJT). Transistors of effect field (*JFET and *MOSFET). Models.
Subject 4. Amplification.	Concepts, parameters, classification. Circuits of polarisation. Models in small signal of the transistors. Frequency response.
Subject 5. *Acoplamiento Of amplifiers.	*Acoplamiento By condenser. Direct attachment. Amplifiers *multietapa. Amplifiers of power.
Subject 6. *Realimentación.	Concepts. Influence and advantages of the *realimentación negative, Types of *realimentación negative. Influence of the *realimentación in the levels of impedances. Swing.
Subject 7. Operational amplifiers.	Concept. Characteristics. Differences between the operational amplifier ideal and the real operational amplifier. Leaves of characteristics.
Subject 8. Applications of the operational amplifiers.	Linear applications: investor, no investor, follower, *restador, *sumador, *integrador, *derivador. Applications no linear: generators, comparators, *rectificadores, fixers, *limitadores and detectors of beak. Analog timers: The 555. Active filters of prime importance.
Subject 9. Sources of feeding regulated.	Concept. Types of regulators: series, parallel. Regulators of tension integrated. Applications.

Planning

	Class hours	Hours outside the classroom	Total hours
Introductory activities	0	1	1
Case studies / analysis of situations	0	15	15
Master Session	23	0	23
Troubleshooting and / or exercises	15	29	44
Autonomous troubleshooting and / or exercises	0	27	27
Previous studies / activities	0	20	20
Laboratory practises	15	0	15
Long answer tests and development	3	0	3
Other	2	0	2

*The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.

Methodologies

Description

Introductory activities	(*)Con antelación ao comezo das sesións presenciais estará a disposición dos alumnos unha listaxe detallada de coñecementos que deben de adquirir ao longo da súa formación previa e que lle serán necesarios para afrontar a materia con éxito.
Case studies / analysis of situations	(*)Con antelación á realización das sesións teóricas, os alumnos disporán dunha serie de materias que han de preparar, pois sobre eles versarán ditas sesións.
Master Session	(*)Desenvolveranse nos horarios fixados pola dirección do centro. Consistirán nunha exposición por parte do profesor de aspectos relevantes da materia que estarán relacionados coas materias que previamente debeu traballar o alumno. Deste xeito propíciase a participación activa do mesmo, que terá ocasión de expor dúbidas e preguntas durante a sesión. Cando resulte oportuno ou relevante procederase á resolución de exemplos e/ou problemas que ilustren adecuadamente a problemática a tratar. Na medida en que o tamaño dos grupos o permita propiciárase unha participación o máis activa posible do alumno.
Troubleshooting and / or exercises	(*)Durante las sesiones de aula, cuando resulte oportuno o relevante se procederá a la resolución de ejemplos y/o problemas que ilustren adecuadamente la problemática a tratar.
Autonomous troubleshooting and / or exercises	(*)Despois de cada sesión teórica de aula o alumno debería realizar, de forma sistemática un estudo de consolidación e repaso onde deberían quedar resoltas todas as súas dúbidas con respecto á materia. As dúbidas ou aspectos non resoltos deberá expolos ao profesor o máis axiña posible, a fin de que este utilice estas dúbidas ou cuestións como elemento de *realimentación do proceso de ensino-aprendizaxe.
Previous studies / activities	(*)É absolutamente imprescindible que, para un correcto aproveitamento, o alumno realice unha preparación previa das sesións prácticas de laboratorio, para iso forneceráselle indicacións e material específico para cada sesión con antelación suficiente. O alumno deberá traballar previamente sobre o material fornecido e tamén debe ter preparados os aspectos teóricos necesarios para abordar a sesión. Esta preparación previa será un elemento que se terá moi en conta á hora de avaliar cada sesión práctica.
Laboratory practises	(*)Durante as sesións de prácticas os alumnos realizarán actividades do seguinte tipo: <ul style="list-style-type: none"> - Montaxe de circuitos. - Manexo de instrumentación electrónica - Medidas sobre circuitos - Cálculos relativos á montaxe e/ou medidas de comprobación - Recompilación e representación de datos Ao final de cada sesión de prácticas cada grupo entregará as follas de resultados correspondentes.

Personalized attention

Methodologies	Description
Laboratory practises	*Tutorías: In the schedules of *tutorías the students will be able to attend to the dispatches of the professors to receive orientation and academic support. Email: The students also will be able to request orientation and support by means of email to the professors of the matter. This way of attention is advisable for indications and short doubts of punctual type.

Assessment

	Description	Qualification	Training and Learning Results	
Laboratory practises	The practices of laboratory will evaluate of continuous way (session to session). The criteria of evaluation are: <ul style="list-style-type: none"> - A minimum assistance of 80%. - *Puntualidad. - Previous preparation of the practices. - *Aprovechamiento Of the session. - The practical sessions will realise in groups of two students. The billed of the practices will be the disposal of the students with *antelación. - The students answered in a group of leaves the results, that will deliver to the ending of the practice. These leaves will serve to justify the assistance and value the *aprovechamiento. 	20	C11	D10
Long answer tests and development	It will consist in a proof written of individual and face-to-face character that will realise when finalising the *cuatrimestre, in the schedules established by the direction of the centre. The proof will be able to consist in a combination of the following types of exercises: <ul style="list-style-type: none"> - you Question type test. - Questions of short answer. - Problems of analysis. - Resolution of practical cases. 	60	C11	D2 D9

Other	<p>Evaluation of thematic blocks:</p> <p>This part supports the *autoaprendizaje and provides *realimentación to the student.</p> <p>It is thought so that the student value of honest and objective form the level of learning reached and obtain *realimentación the same.</p> <p>It will consist in the individual realisation of relative proofs to a thematic block, that will realise , if and possible, by *mediostelemáticos. The proofs will consist in questions type test, questions of enclosed answer and problems of analysis with numerical answer.</p>	20	B3 C11 D2 D9
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Other comments on the Evaluation

To surpass the *asignatura, the student has to obtain 5 points on 10.

Recommendations:

The students will be able to consult any relative doubt to the activities assigned to the group of work to the that belong or the matter seen in the face-to-face hours in the hours of *tutorías or through the means related in the section of Attention to the student.

The students have to fulfil *inexcusablemente the terms established for the different activities.

In the different proofs advises to the students that justify all the results that reach. To the hour to mark them will not give any result by *sobrentendido and will take into account the method employed to arrive to the solution proposed.

It recommends , in the presentation of the diverse exercises, not presenting faults of spelling and characters or unreadable symbols, because they will affect the final punctuation.

It can not use pencil. They will not correct the examinations to which was missing him any of the leaves that accompany to the billed.

During the realisation of the final examination will not be able to use aim and the mobile telephones will have to be turned off.

Guidelines for the improvement and the recovery:

In case that a student do not approve the matter in the first announcement, has of a second announcement in the present academic course. The corresponding final qualification for this second announcement will obtain like result to add the following notes:

- 1.- The note obtained in the evaluation of the practices of laboratory in the first announcement, with a weight of 20% of the final qualification.
- 2.- The note obtained in the evaluation of the thematic blocks with the same *contextualización that in the first announcement. The weight of this note is of 20% of the final qualification.
- 3.- The note obtained in the evaluation of the final examination realised in this announcement with the same *contextualización that in the first announcement. The weight of this note is of 60% of the final qualification.

To approve the matter in this second announcement is necessary to obtain an equal final punctuation or upper to 5 points.

Once finished the present academic course the note obtained in the evaluation of the final examination loses his validity. The notes obtained in the evaluations of practices and of the thematic blocks will keep during the two academic courses following to the present course, except that the student wish to do them again.

Evaluation of students with renunciation to the evaluation continued:

The students that was them conceded, of official form by the centre, the renunciation to the evaluation continued, will have to realise a proof written similar to the proof *individualizada of long answer and a practical proof of laboratory.

Both proofs will have a maximum punctuation of 10 points. The final note will be the average of the notes of the two proofs. To surpass the *asignatura will have to obtain an equal or upper note to 5 points. The proof written will realise when finalising the *cuatrimestre, in the schedules established by the direction of the centre. The practical proof in a near date to the previous and that will propose in function of the availability of the laboratories.

Ethical commitment:

it expects that the present student a suitable ethical behaviour. In case to detect a no ethical behaviour (copy, plagiarism, utilisation of unauthorised electronic devices, for example), will consider that the student does not gather the necessary requirements to surpass the matter. Depending of the type of behaviour no ethical detected, could conclude that the student does not reach the competitions *B2, *B3 and *CT19.

Sources of information

Recommendations

Subjects that continue the syllabus

Digital Electronics and Microcontrollers/V12G330V01601
Electronic Instrumentation I/V12G330V01503
Power Electronics/V12G330V01701
Industrial Electronics/V12G330V01924
Electronic Instrumentation II/V12G330V01921

Subjects that are recommended to be taken simultaneously

Automation and Control Fundamentals/V12G330V01401

Subjects that it is recommended to have taken before

Physics: Physics I/V12G330V01102
Physics: Physics II/V12G330V01202
Computing for Engineering/V12G330V01203
Mathematics: Calculus I/V12G330V01104
Mathematics: Calculus II and Differential Equations/V12G330V01204
Basics of Circuit Analysis and Electrical Machines/V12G330V01303

Other comments

To enrol in this *asignatura is advisable and necessary have surpassed, or be enrolled of all the matters of the inferior courses to the course in that it is situated this *asignatura.
