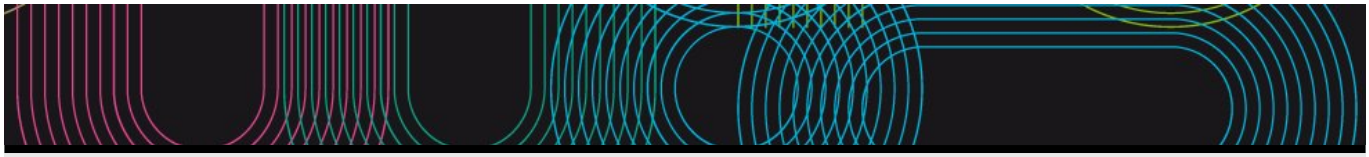

IDENTIFYING DATA				
Electrical engineering				
Subject	Electrical engineering			
Code	V12G320V01401			
Study programme	Grado en Ingeniería Eléctrica			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	9	Mandatory	2nd	2nd
Teaching language	Spanish			
Department				
Coordinator	Garrido Suárez, Carlos			
Lecturers	Garrido Suárez, Carlos			
E-mail	garridos@uvigo.es			
Web	http://www.uvigo.es/uvigo_gl/departamentos/area_tecnologica/enxeneria_electrica.html			
General description	The matter of Electrotechnics has like general aim complete the training of the students that go to *cursar the Degree of Electrical Engineering in Theory of Circuits with the end to supply him specific tools that allow him tackle, analyse and evaluate the behaviour of the electrical circuits so much in diet *estacionario as in transitory diet. The matter is conceived to supply knowledges, aims and competitions that are necessary to tackle with guarantees other matters of the courses 3º and 4º. For a *aprovechamiento suitable of this matter and that do not suppose a *sobreesforzo additional for the student, would owe to have *cursado previously the matters of Foundations of Theory of Circuits and Electrical Machines and Calculation I and II since we will give by given basic knowledges of both matters that serve of starting point for the development of the Electrotechnics.			

Skills	
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.
C10	CE10 Knowledge and use of the principles of circuit theory and electrical machines.
D2	CT2 Problems resolution.
D10	CT10 Self learning and work.
D14	CT14 Creativity.
D17	CT17 Working as a team.

Learning outcomes			
Expected results from this subject	Training and Learning Results		
Comprise the basic appearances of the behaviour of the electrical circuits in front of a change of conditions	B3	C10	D2 D10 D14 D17
Dominate the available current technicians for the analysis of electrical circuits *trifásicos balanced and unbalanced	B3	C10	D2 D10 D14 D17
Know the technicians of measure and register of data in the real electrical circuits	B3	C10	D2 D10 D14 D17
Purchase skills on the process of analysis of electrical circuits in diets of fault	B3	C10	D2 D10 D14 D17

Contents	
Topic	
SUBJECT I: CIRCUITS IN TRANSITORY DIET The aim that pretends reach with this subject is that the student know to analyse the answer of the electrical circuits in *réximen transitory, differentiating clearly between the permanent answer and the transitory and the identification of the same in the circuits considering the performance of the initial conditions and of the sources. It begins with simple circuits of first order, *incidiéndose on the behaviour of the distinct elements of the circuit and the typification of the answers. It explains also the difference between the natural answer and the forced, that is to say, the answer owed the initial conditions imposed by the elements *almacenadores of energy and the answer owed the sources of independent excitation. It extends the study to circuits of second order, and explain technicians of analytical resolution and by means of the transformed of Laplace. They enter new technicians of resolution so much temporary (method *discretizado) like *frecuenciales (application of the transformed of Laplace).	□ Types of answers and diets in the linear circuits. □ Methods to obtain the answer of circuits in transitory diet. □ Linear circuits of first order. □ Linear circuits of second order. □ Resolution by the method *discretizado
SUBJECT II:CIRCUITS OF THAT TRIPHASES. MEASURES. COMPENSATION. With this subject, intends that the student know to analyze circuits triphases so much balanced how unbalanced. It initiates the subject with the basic concepts stop the analysis of circuits balanced. It continues with the unbalanced circuits, the different methods to measure the power and the compensation of power reactivates as well as the methods to determine the sequence of phases. It finalizes with an introduction to the symmetrical components.	□ Introduction: Introduction: Generators, cargos and circuits triphases. □ Circuits triphases balanced. Tensions and intensities. □ Conversion of sources and triphases charges. □ Analysis of circuits triphases balanced. □ Power in circuits triphases balanced. Compensation. □ Analysis of circuits triphases unbalanced. □ Determination of the sequence of phases and measure of power and energy. □ Symmetrical components.
SUBJECT III: ANALYSIS OF *CORTOCIRCUITOS IN ELECTRICAL CIRCUITS. The aim that pretends reach with this subject is that the student know and know to analyse the different types of *cortocircuitos that can present in circuits and electrical networks using methods of suitable analyses to each situation as well as know the application of norms for his determination.	□ Introduction to the *cortocircuitos. □ Analysis of *cortocircuitos *trifásicos balanced. □ Networks of sequence. Connection of networks of sequence. □ *Cortocircuitos Unbalanced. □ Norms for the calculation of *cortocircuitos.

Planning			
	Class hours	Hours outside the classroom	Total hours
Lecturing	30	60	90
Problem solving	28.8	2.88	31.68
Autonomous problem solving	0	54.32	54.32
Practices through ICT	20	20	40
Essay questions exam	9	0	9
*The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.			

Methodologies	
	Description
Lecturing	The professor exposes in class of big group the contents of the matter
Problem solving	In the classroom the professor resolves problems and exercises of the *temario and arouse to the student similar exercises for his resolution with other mates.
Autonomous problem solving	The student will have to resolve by his account a series of exercises and questions of the matter proposed by the professor.
Practices through ICT	The student in collaboration with other mates has to resolve diverse electrical settings using a computer software that allow him put in practice the knowledges purchased in the classes of classroom.

Personalized assistance

Methodologies	Description
Lecturing	The doubts and questions that can arise during the classes and the personal work of the student will be resolved well in situ or during the time of *tutorías.Also it will be possible to attention by means of the email for the resolution of doubts.
Problem solving	The doubts and questions that can arise during the classes and the personal work of the student will be resolved well in situ or during the time of *tutorías.Also it will be possible to attention by means of the email for the resolution of doubts.
Practices through ICT	The doubts and questions that can arise during the classes and the personal work of the student will be resolved well in situ or during the time of *tutorías.Also it will be possible to attention by means of the email for the resolution of doubts.
Autonomous problem solving	The doubts and questions that can arise during the classes and the personal work of the student will be resolved well in situ or during the time of *tutorías.Also it will be possible to attention by means of the email for the resolution of doubts.

Assessment

	Description	Qualification	Training and Learning Results
Essay questions exam	Continuous evaluation (100%): at the end of each subject the student will make a proof that will describe as 0 to 10 points, reaching the approved with a 5. The partial proofs approved are *liberatorias of the corresponding part in the final examination of the common announcements. The students that surpass all the proofs, the final note will be the average *ponderado of the partial proofs, corresponding him 25%, 40% and 35% to the subjects I, II and III respectively. For the students that suspend or do not present to any or to all the partial proofs will make a final examination of the partial no surpassed that it will describe each one of them of 0 to 10 points, reaching the approved of each a with a 5. To surpass the matter is necessary condition obtain a minimum of 2 points on 10 in each partial. The final note is the result to do the average *ponderado indicated of the final notes of the partial, surpassing the matter if said note is equal or upper to 5. The students that do not reach the minimum of 2 points on 10 in a partial, the final note will be at most a 4.5 although the average *ponderado result upper. The students approved by partial proofs can modify the note presenting also to the final proof. In the examination will indicate the dates of publication of the notes and of the review. Ethical commitment: it Expects that the present student a suitable ethical behaviour. In the case to detect a no ethical behaviour (copy, plagiarism, utilisation of unauthorised electronic devices, and others) will consider that the student does not gather the necessary requirements to surpass the matter. In this case the global qualification in the present academic course will be of suspense (0.0)	100	B3 C10 D2 D10 D14 D17

Other comments on the Evaluation

The student only has to make in the second announcement the partial no surpassed in the first. The final result calculates to the equal that in the first announcement

Sources of information

Basic Bibliography

V.M. Parra, A. Pérez, A. Pastor, J. Ortega, **Teoría de Circuitos**, 1991,

E. Estévez, C. Garrido, J. Cidrás, **Ejercicios resueltos de circuitos eléctricos**, 1999,

F. Barrero, **Sistemas de Energía Eléctrica**, 2004,

Complementary Bibliography

Recommendations

Subjects that continue the syllabus

Electrical installations 1/V12G320V01503
Electrical machines/V12G320V01504

Subjects that it is recommended to have taken before

Physics: Physics 1/V12G320V01102
Physics: Physics 2/V12G320V01202
Mathematics: Calculus 1/V12G320V01104
Mathematics: Calculus 2 and differential equations/V12G320V01204

Other comments

Requirements: To enrol in this matter is necessary to have surpassed or be enrolled of all the matters of the inferior courses to the course in that it is *emplazada this matter.

Contingency plan

Description

=== EXCEPTIONAL PLANNING ===
Given the uncertain and unpredictable evolution of the health alert caused by COVID-19, the University of Vigo establishes an extraordinary planning that will be activated when the administrations and the institution itself determine it, considering safety, health and responsibility criteria both in distance and blended learning. These already planned measures guarantee, at the required time, the development of teaching in a more agile and effective way, as it is known in advance (or well in advance) by the students and teachers through the standardized tool.

=== ADAPTATION OF THE METHODOLOGIES ===
* Teaching methodologies maintained
In case of virtual or mixed teaching, keep the same educational methodologies that in face-to-face teaching using the telematic means that the University puts to disposal of the teachers and students (Faitic, Campus Remoto and/or Campus Integra)

* Teaching methodologies modified
Any

* Non-attendance mechanisms for student attention (tutoring)
The student attention (tutoring), in case of virtual or mixed teaching, will manage of telematic form by means of the use of the available telematic tools (Faitic, Campus Remoto and/or Campus Integra, e-mail, phone)

* Modifications (if applicable) of the contents
Any

* Additional bibliography to facilitate self-learning
Any

* Other modifications
Any

=== ADAPTATION OF THE TESTS ===
* Tests already carried out
The face-to-face proofs made keep his value and weight in the global evaluation

* Pending tests that are maintained
The pending proofs to make are supported by his value and weight in the global evaluation, making through the distinct tools put to disposal of the teachers and students (faitic, email, Campus Remoto , Campus Integra, telephone, etc.)

* Tests that are modified
Any

* New tests
Any

* Additional Information
The criteria of evaluation are kept adapted to the realisation of the proofs, in the case to be necessary and by indication in Resolution Rectoral, using the telematic means places to disposal of the theachers