Universida_{de}Vigo

Subject Guide 2020 / 2021

IDEN	TIFYING	G DATA					
Elect	rical en	nergy management					
Subje	ct	Electrical energy					
Codo							
Study	,						
progr	amme	Engineering					
Descr	riptors	ECTS Credits	Choose	Year	Quadmester		
		9	Optional	4th	1st		
Teach	ning	Spanish					
langu	age	Galician					
		English					
Depa	rtment	Villanuova Terros, Daniel					
		Parajo Calvo, Borpardo Josó					
Lectu	IEIS	Villanueva Torres Daniel					
E-mai	il	dvillanueva@uvigo.es					
Web		http://faitic.uvigo.es					
Gene	ral	Electrical Energy Management					
descr	iption						
Comp	petenci	es					
Code							
C45 (Op8 Cap	pacity to manage energy installation audits.					
C48 (Opii Ca	apacity to analyze the economics of electrical energy p	roduction system	m operations. Knov	viedge of the electrical		
<u>C10</u>	On12 Kn	nalket.	nd canacity to a	onnly them			
$\frac{C+J}{D1}$	Canacity	to interrelate all the acquired knowledge and interpre-	t it as compone	nts in a body of kn	owledge with a clear		
91	structure	e and strong internal coherence			omedge man a cical		
D2 (Capacity	acity to develop a complete project in any field included in this type of engineering, suitably combining acquired					
I	knowled	ge, accessing necessary information sources, undertaking the necessary enquiries and integrating into inter-					
	disciplina	ary work teams.					
D3 I	Propose	and develop practical solutions, which develop suitable	e strategies bas	ed on theoretical k	nowledge, for problem		
	know wł	and and situations that arise as everyday realities in e	dating of all the	information require	ad to undertake their		
ונט	work. wi	with access to all the current and future tools for seeking information and adapting it in the light of technological					
č	and soci	cial changes					
D6 I	Know an	nd handle legislation applicable to the sector, know the	social and busi	ness environment a	and know how to work		
t	together	r with the Administration and use acquired knowledge	to draw up engi	neering projects ar	nd develop any of the		
	aspects	ts of professional work required					
D7 (Capacity	/ to organise, interpret, assimilate, create and manage	all the informat	tion needed to orga	anise their work,		
	Conceive	e engineering within a framework of sustainable devel	opment with an	awareness of envir	onmental issues		
D9 I	Know the	e importance of the security aspects and be able to tra	ansmit this infor	mation to the stake	eholders.		
D10	Become	aware of the need for training and continual improver	nent in guality, o	developing the valu	ues associated with		
9	scientific	c thinking and showing a flexible, open and ethical atti	tude towards div	verse opinions and	situations, particularly		
i	in matte	matters of non-discrimination on the grounds of gender, race or religion, respect for fundamental rights, accessibility,					
	etc						
Lear	ning ou	tcomes					

Expected results from this subject

Training and Learning Results

D9 D10
To macter the current techniques for energetic analisys (huy/sale) on the electrical market C49 D1
D3
D5
D6
D7
To know the regulations related to the quality of the electrical supply C48 D1
D3
D5
D6
D7
D9
To know the methodology and outcomes of a energetic audit C45 D1
D2
D3
D5
D6
D7
D8
D9
To know the procedures for energetic management in the industrial environment C49 D1
U2
D3
DS DC
Db
D7
U8

Contents	
Торіс	
OPERATION OF THE ELECTRICAL POWER	States of the electrical system.
SYSTEMS.	Analysis of contingencies.
	Analysis of contingencies based in Load Flow.
OPTIMUM OPERATION OF THE GENERATION.	Economic dispatch of units of generation.
	Time programming and hydrothermal coordination
OPERATION OF THE ELECTRICAL MARKETS.	Operation of the electrical market.
	Subjects of the market.
	Match procedures.
	Analysis of options of purchase of energy.
QUALITY OF THE ELECTRICAL PROVISION	Reliability.
	Index of quality of electricla provision.
	Standards.
ENERGY AUDIT: METHODOLOGY AND RESULTS	Basic concepts: luminotechnics, quality of wave, design installations.
	Energetic efficiency in the installations: Illumination, photovoltaic solar
	contribution.
	Standards.
SYSTEMS OF MANAGEMENT OF ELECTRICAL	Contribution to the energy efficiency of the systems of management.
ENERGY. INDUSTRIAL AND TERTIARY STATES.	Energy performance concept.
	Standards.

Planning				
	Class hours	Hours outside the classroom	Total hours	
Lecturing	25	50	75	
Problem solving	10	10	20	
Autonomous problem solving	0	29.4	29.4	
Seminars	3.8	3.8	7.6	
Practices through ICT	37.5	37.5	75	
Essay	0	8	8	
Essay questions exam	2	8	10	

*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 teacher will expose the content of the matter.
Problem solving	The teacher will carry out exercises and problems of the contents of the matter, and the students will do problems and exercises of the same type.
Autonomous problem solving	The student will have to solve several exercises and problems proposed
Seminars	Some problems and specific practical exercises will be performed considering computer support, research of information, use of programs of calculation,
Practices through ICT	Problems and practical exercises will be performed considering computer support, research of information, use of programs of calculation,

Personalized assistance			
Methodologies	Description		
Practices through ICT	For all the modalities of teaching, the sessions of tutorials would be made by telematic means (email, videoconference, forums of FAITIC,) By means of previous concertation. The realisation of the practices will be individual, with the help of the teachers when the student needs it and this can be performed during the hours of practices, during the tutorials and/or through email.		
Seminars	The seminars will consist of the realisation of practices in small groups, in such a way that the attention by part of the teachers can be higher. The teachers will try, during them, that the students can solve more general doubts, concepts or base-knowledge issues, in case they exist.		

Assessment				
	Description	Qualification	Traini	ing and
			Learnin	g Results
Practices through ICT	Delivery of the summary of the process developed during the practices.	10	C48	D2 D5
	Learning outcomes:			D6
	-Know the electrical market working.			D7
	-Catch up the current techniques to analyze the buy/sell bids in the			D9
	electrical market.			D10
	-Know the standards and the concepts related to the quality of the			
	electrical supply.			
	-Know the methodology and the obtainable results of the energy audits.			
	-Know the procedures for the energy management in the industrial			
	environment.			
Essay	The teachers will propose several projects to the student providing solution to complex problems.	30	C45 C49	D1 D2
				D3
	Learning outcomes:			D5
	-Know the electrical market working.			D6
	-Catch up the current techniques to analyze the buy/sell bids in the			D7
	electrical market.			D8
	-Know the standards and the concepts related to the quality of the			D9
	electrical supply.			D10
	-Know the methodology and the obtainable results of the energy audits.			
	-Know the procedures for the energy management in the industrial			
	environment.			
Essay questions	The teachers will propose global problems to the students, where they will	60	C48	D1
exam	have to realise an approach, some operations and give a solution.		C49	D3
				D5
	Learning outcomes:			D7
	-Know the electrical market working.			
	-Calch up the current techniques to analyze the buy/sen bids in the			
	Know the standards and the concents related to the quality of the			
	oloctrical supply			
	Know the methodology and the obtainable results of the operative audits			
	-Know the procedures for the energy management in the industrial			
	environment.			

Other comments on the Evaluation

The practices can be recovered in any one of the two editions of the final exam of the subject

The mark of any one of the parts is saved along the course, but won't be saved for the following academic years. Exam schedule. Verify / check this information in the website of the school: http://minaseenerxia.uvigo.es/gl/docencia/exames

Sources of information

Basic Bibliography

Grainger, John J.; Stevenson, William D., **Análisis de sistemas de potencia**, 1ª Edición, McGraw Hill, 1996 Gómez Expósito, Antonio, **Análisis y operación de sistemas de energía eléctrica**, 1ª Edición, McGraw Hill, 2002 Duncan Glover, J; Sarma, Mulukutla S., **GSistemas de potencia**, 3ª edición, Thomson, 2003

Complementary Bibliography

Padiyar, K. R., Power System Dynamics, 1ª Edición, John Wiley and Sons, 1996

Duncan Glover, J; Sarma, Mulukutla S.; Overbye, Thomas J., **Power System Analysis and Design**, 4ª edición, Thomson, 2008

Wadhwa, C. L., Electrical Power Systems, 2^a edición, John Wiley and Sons, 1991

Recommendations	
Subjects that continue the syllabus	
Final Year Dissertation/V09G290V01991	

Subjects that it is recommended to have taken before

Electrotechnology/V09G290V01301 Renewable energy installations/V09G290V01604 Electrical technology I/V09G290V01504 Electrical technology II/V09G290V01602

Contingency plan

Description

Considering the uncertain and unpredictable evolution of the health alert caused by COVID-19, the University establishes an extraordinary planning that will be activated when the administrations and the institution determine it. It is based on safety, health and responsibility, and it guarantees teaching in an online or semi-presential modalities. These already planned measures will guarantee, at the required time, the development of teaching in a more agile and effective way, because they will be known in advance by students and teachers through the standardized tool for teaching guides DOCNET.

1. Semi-presential modality

Once the semi-presential teaching is required, it would mean a reduction of the capacity of the teaching spaces used in the face-to-face modality. Therefore, as the first measure of the centre, the capacity of the teaching spaces would be reformulated and informed to the teachers, in order to proceed to reorganize the formative activities for the rest of the semester. It should be noted that the reorganization will depend on the moment throughout the semester in which this semi-presential modality is activated. For the reorganization of the teaching activities, the following guidelines would be followed:

Through the FaiTIC platform, all the students will be informed about the new conditions under which the formative activities and assessment tests will be carried out at the end of the semester.

The tutorial sessions will be carried out by telematic means (email, videoconference, FAITIC forums, ...) with prior agreement.

Once some of the students have carried out experimental or computer laboratory practices in the face-to-face modality, if it is possible, the rest of the students will have the possibility to perform the same or equivalent activities in the same modality.

For the rest of the activities until the end of the semester, it should be done a proper identification of those formative activities which can be done under face-to-face modality and those which will be carried out remotely.

Regarding the potential tools to be applied for the formative activities during the online mode, CampusRemoto and the FaiTIC platform will be used.

2. Online modality

In the event that the non-face-to-face teaching modality is required (suspension of all face-to-face formative and assessment

activities), the tools currently available at the University of Vigo, CampusRemoto and the FaiTIC platform will be used. The reorganization will depend on the moment throughout the semester in which this online modality is activated. In the reorganization of the teaching activities, the following guidelines would be followed:

2.1. Communication

Through the FaiTIC platform, all the students will be informed about the new conditions under which the formative activities and assessment tests will be carried out at the end of the semester.

2.2. Adaptation and / or modification of teaching methodologies

As the teaching methodologies have been conceived for the face-to-face teaching modality, the teaching methodologies that would be kept and those which would be modified or replaced in the online modality are indicated below.

The teaching methodologies that would be kept, since they can be used in face-to-face and online teaching mode: All would be kept.

The teaching methodologies that would be modified are the following: None would be modified.

2.3. Adaptation of tutorial sessions and personalized attention The tutorial sessions may be carried out by telematic means (email, videoconference, FAITIC forums, ...) with prior agreement.

2.4. Evaluation

The type of assessment tests and their weight in the final assessment would not be modified.

2.5. Bibliography or additional material to facilitate self-learning Not applicable.