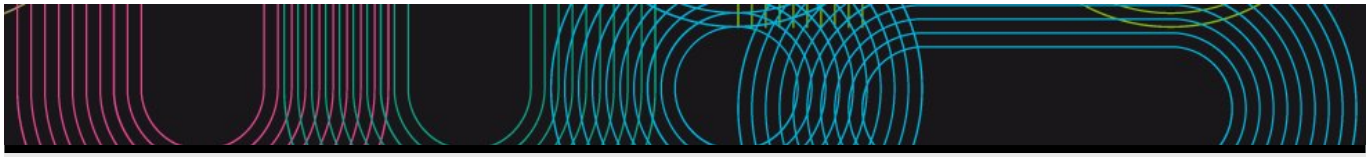

IDENTIFYING DATA				
Geomatics				
Subject	Geomatics			
Code	V09G290V01401			
Study programme	Degree in Energy Engineering			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Mandatory	2nd	2nd
Teaching language	Spanish Galician English			
Department	Natural Resources and Environment Engineering			
Coordinator	Martínez Sánchez, Joaquín			
Lecturers	Garrido González, Iván Liñares Méndez, Patricia Martínez Sánchez, Joaquín Rodríguez Somoza, Juan Luis			
E-mail	joaquin.martinez@uvigo.es			
Web	http://http://faitic.uvigo.es/			
General description	The objective of this subject is that the students acquire the main concepts about data acquisition with different kinds of sensors (topographic, photogrammetric and LiDAR, GPS...) oriented to gathering maps and/or planes and presenting the results making use of Geographical Information Systems (GIS).			

Competencies	
Code	
C14	Knowledge of topography, photogrammetry and cartography.
D1	Capacity to interrelate all the acquired knowledge and interpret it as components in a body of knowledge with a clear structure and strong internal coherence
D3	Propose and develop practical solutions, which develop suitable strategies based on theoretical knowledge, for problem phenomena and situations that arise as everyday realities in engineering
D4	Encourage work based on cooperation, communication skills, organization, planning and recognition of responsibility in a multilingual and multidisciplinary working environment that fosters education in equality, peace and respect for fundamental rights
D5	Know what sources are available for ongoing and continual updating of all the information required to undertake their work, with access to all the current and future tools for seeking information and adapting it in the light of technological and social changes
D7	Capacity to organise, interpret, assimilate, create and manage all the information needed to organise their work, handling the I.T., mathematical, physical and other tools required

Learning outcomes		
Expected results from this subject		Training and Learning Results
Understanding of the basic aspects needed to draw up plans at different scales.	C14	D1 D3 D7
Mastery of current techniques for data collection in the field using different sensor types which enable map and plan creation.	C14	D1 D5 D7
Knowledge of topographic techniques for data collection.	C14	D1 D3 D7
Ability to handle the main topographic instruments.	C14	D1 D3 D4 D7

Knowledge of photogrammetric techniques for collecting and processing data.	C14	D1 D3 D4 D5 D7
Acquisition of skills to use data from different sources to obtain point clouds which can later allow the creation of plans at different scales.	C14	D1 D3 D7

Contents	
Topic	
Error en traducción.	Error en traducción.
Error en traducción.	Error en traducción.
(*)*Fundamentos Of wool *fotogrametría	(*)
(*)Sensors LIDAR	(*)
(*)*Fundamentos Of wool *topografía. Topographical instruments	(*)
(*)*Levantamientos Topographical	(*)

Planning			
	Class hours	Hours outside the classroom	Total hours
Problem solving	7.5	17.5	25
Laboratory practices	8	15	23
Computer practices	13	21	34
Group tutoring	1.5	4	5.5
Lecturing	19.5	20	39.5
Problem solving	2	10	12
Objective questions exam	0.5	5	5.5
Practices report	0.5	5	5.5
*The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.			

Methodologies	
	Description
Problem solving	Activity in which a number of problems and/or exercises related with the subject are presented to the students. The student must develop suitable and correct solutions by means of routines, the application of formulas or algorithms, the application of procedures of transformation of the available information and the interpretation of the resulted. It usually employ how supplement of the master class lessons.
Laboratory practices	Application of the learnt concepts to concrete situations and acquisition of basic and procedural skills related with the subject object of study. Developmetnt in special spaces with specialized equipment.
Computer practices	Application of the knowledge to concrete situations, and of acquisition of basic and procedural skills related with the subject object of study, developed in classrooms of computing.
Group tutoring	Interviews between the lecturer and the students focused on consulting and development of activities and /or the learning process.
Lecturing	Exposition by the lecturer of the theoretical concepts and basics of the subject and/or guidelines for exercises or projects to be developed by the students.

Personalized attention	
Methodologies	**Description**
Laboratory practices	Orientation, support and motivation for the learning process will be provided face-to-face in the classroom and in the schedule assigned to office tutorials.
Computer practices	Orientation, support and motivation for the learning process will be provided face-to-face in the classroom and in the schedule assigned to office tutorials.
Group tutoring	Orientation, support and motivation for the learning process will be provided to groups of students, face-to-face in the classroom and in the schedule assigned to office tutorials.

Assessment			
	Description	Qualification	Training and Learning Results

Computer practices	A continuous evaluation process will be followed by monitoring the work in the computer classroom practices. Learning outcomes: Understanding of the basic aspects needed to draw up plans at different scales.- Mastery of current techniques for data collection in the field using different sensor types which enable map and plan creation. -Ability to handle the main topographic instruments. Knowledge of topographic techniques for data collection. Acquisition of skills to use data from different sources to obtain point clouds which can later allow the creation of plans at different scales.	20	C14	D1 D3 D4 D5 D7
Problem solving	Overall assessment of the teaching-learning process and the acquisition of competencies and knowledge through resolutions of problems and exercises. Learning outcomes: - Understanding of the basic aspects needed to draw up plans at different scales. - Mastery of current techniques for data collection in the field using different sensor types which enable map and plan creation. - Ability to handle the main topographic instruments. Knowledge of topographic techniques for data collection.	50	C14	D1 D5
Objective questions exam	Overall assessment of the teaching-learning process and the acquisition of competencies and knowledge through test-type tests. Learning outcomes: - Understanding of the basic aspects needed to draw up plans at different scales. Knowledge of topographic techniques for data collection. Knowledge of photogrammetric techniques for collecting and processing data. Acquisition of skills to use data from different sources to obtain point clouds which can later allow the creation of plans at different scales.	10	C14	D1 D5
Practices report	Overall assessment of the teaching-learning process and the acquisition of competencies and knowledge through the realization of works and / or projects. Learning outcomes: Mastery of current techniques for data collection in the field using different sensor types which enable map and plan creation. Knowledge of photogrammetric techniques for collecting and processing data. Ability to handle the main topographic instruments. Acquisition of skills to use data from different sources to obtain point clouds which can later allow the creation of plans at different scales.	20	C14	D1 D3 D4 D5 D7

Other comments on the Evaluation

It will be necessary to reach a minimum mark for both practical and theoretical parts of the subject. This mark will be set during the lectures and only the students that reach both minima will pass the ordinary examination call. The final mark will be the average of theoretical and practical marks.

Marks could be kept for those students that had reached a minimum mark during the ordinary call. On the contrary, students would have to pass the extraordinary examination. The theoretical extraordinary call will consist of problem solving and test assessment on the official date.For practical contents assessment, students would have to present a report about the pending parts of the subject or pass a pratical examination that will be described during the lectures.

Again, the final mark will be the average of theoretical and pratical marks.

Exam Timetable: Exam dates and rooms must be verified in the official webpage of the school:

http://minaseenerxia.uvigo.es/es/docencia/examenes

Sources of information

Basic Bibliography

Wolf, Paul R. y Brinker, Russell C., **Topografía**, 11ª ed., Alfaomega, 2009 reimp. 2014

de Sanjosé Blasco, José Juan; López González, Mariló; Atkinson, Alan D.J., **Topografía para estudios de grado: geodesia, cartografía, fotogrametría, topografía (instrumentos, métodos y aplicaciones), replanteo, seguridad del topógrafo en el trabajo**, 3ª ed., Bellisco, 2015

Delgado Pascual, Mercedes (et al.), **Problemas resueltos de topografía**, 1ª ed., Universidad de Salamanca, 2006 reimp. 2011

Lerma García, José Luis, **Fotogrametría moderna: analítica y digital**, 1ª ed., Universidad Politécnica de Valencia, 2002

Chuvieco Salinero, Emilio, **Fundamentos de la teledetección espacial**, 3ª ed., Rialp, 1996

Complementary Bibliography

de Corral Manuel de Villena, Ignacio, **Topografía de obras**, 1ª ed. reimp., Universitat Politécnica de Catalunya, 2001 reimp 2009
Carpio Hernández, Juan Pedro, **Redes topométricas**, 1ª ed., Bellisco, 2001
Santamaría Peña, Jacinto, **Problemas resueltos de topografía práctica**, 2ª ed., Universidad de La Rioja, 1999
Luhmann, Thomas y Robson, Stuart, **Close Range Photogrammetry: Principles, Methods and Applications**, 1ª ed., Whittles Publishing, 2011
Vosselman, George y Maas, Hans-Gerd, **Airborne and Terrestrial Laser Scanning**, 1ª ed., CRC Press, 2010

Recommendations

Subjects that continue the syllabus

Renewable energy installations/V09G290V01604
Hydraulic resources, installations and hydro-power plants/V09G290V01601
Fluid dynamical alternative energies/V09G290V01704
Sustainable exploitation of mining energy resources/V09G290V01803
Construction works, on-site layout and processes/V09G290V01802
Projects/V09G290V01801
Final Year Dissertation/V09G290V01991

Subjects that are recommended to be taken simultaneously

Environmental technology/V09G290V01402

Subjects that it is recommended to have taken before

Graphic expression: Graphic expression/V09G290V01101
IT: Statistics/V09G290V01203