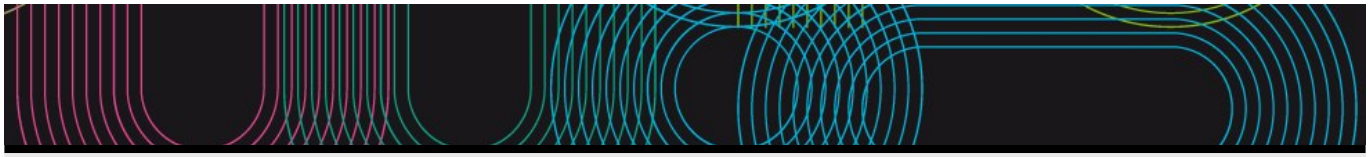

IDENTIFYING DATA				
Forestry hydrology				
Subject	Forestry hydrology			
Code	P03G370V01604			
Study programme	(*)Grao en Enxeñaría Forestal			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Optional	3rd	2nd
Teaching language				
Department	Natural Resources and Environment Engineering			
Coordinator	Álvarez Bermúdez, Xana			
Lecturers	Álvarez Bermúdez, Xana			
E-mail	xaalvarez@uvigo.es			
Web	http://http://www.forestales.uvigo.es/			
General description	Description of the elements that influence in the hydrological cycle. Characterisation of hydrographic basins and quantification of the erosion. Technicians of control and management of the hydrographic basins			

Competencies	
Code	
B3	Knowledge of degradation processes that affect forest systems and resources (pollution, pests and diseases, fires, etc.) and capacity for the use of forest environment protection techniques, forest hydrological restoration and biodiversity conservation .
C9	Ability to know, understand and use the principles of: forestry hydraulics; hydrology and hydrological-forest restoration.
D4	Sustainability and environmental commitment

Learning outcomes			
Expected results from this subject	Training and Learning Results		
New	B3	C9	D4

Contents	
Topic	
Subject1 Introduction and generalities	Hydrological cycle. The hydrological basin. Physical parameters of the basin. Soil and climate. Actions of the forest on the water regulation. Hydrological subsystems. Hydrological models. legal framework .
Subject 2 Precipitation	Training and types. Measured atmospheric humidity. Terminal Speed drops rain. Size drops and kinetical energy. Measure and distribution of the precipitation. Methods of work with rainfall data. Half precipitation on an area
Subject 3 Evaporation	Solar radiation Profiles of wind in vegetation Evaporation and evapotranspiration Empirical methods Interception and transpiration in forests

Subject 4 Infiltration	Measure of humidity and potential water in the floor influential Factors instantaneous and accumulated Infiltration Flow in saturated means. Law of Darcy Models of infiltration Measured of the hydraulic conductivity
Subject 5 Runoff	Generation and classification of the flow of runoff Coefficient of runoff. Number Of Curve Methods of Green-Ampt Methods of estimate of runoff monthly Water balance and Thornthwaite
Subject 6 Hydrographs	Separation of basic flow Unitary and synthetic hydrographs Maximum Discharge of runoff
Subject 7 Surface water and groundwater	Aquifers hydrogeological variables Equations of subterranean flow
Subject 8 hydrological Measurements	Discharge Measurements of speed of flow Measurements with sensors of pressure Types of control of relation level and discharge
Subject 9 Driving of avenues of water	Introduction Traffic of aggregated systems hydrological Traffic in rivers Traffic distributed of increasing cinematic Wave
Subject 10 hydrological Statistics	Concepts. Analysis of frequency. Work of distribution. Period of return. Theory of adjust statistical. Analysis of frequency for extreme values .
Subject 11 hydrological Restoration forest	Action of the forest on water regulation. Distribution of the the precipitation in forest masses. Intercept. Translocation. Trunk runoff Hydrological techniques reforestation
Subject 12: Water erosion	Types of erosion. Parametric models Models of analytical solution . Stabilization and rehabilitation techniquesn of areas with risk of erosion
Subject 13: Restoration of banks and rivers	Main pressures and impacts of the Spanish rivers Environmental Assessment of the rivers Features and banks Performances for the improvement and restoration of rivers Development projects Ecological restoration of rivers and banks
Subject 14: transversal Works in the course	Dams of consolidation Dams of retention Planning and technical criteria of execution Act longitudinal in margines rivers Design of breakwaters Pavers background Deflectors

Planning

	Class hours	Hours outside the classroom	Total hours
Computer practices	10	10	20
Autonomous problem solving	30	30	60
Studies excursion	3	3	6
Lecturing	30	30	60
Problem solving	3	0	3
Short answer tests	1	0	1

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

Methodologies

	Description
Computer practices	I handle of software draw computer-aided for treatment of watershed. By means of this methodology develop the competitions A19 and A62
Autonomous problem solving	They will explain and/or they will resolve problems in group from a series of billed facilitated by the professor. The students will have to resolve a small number of exercises for each one of the subjects, that will have to deliver in the term indicated for his qualification. By means of this methodology develop the competitions A19 and A62
Studies excursion	It will realise visit to a place of interest hydrological to observe the hydrological conditions of the same and infrastructures and techniques of restoration employed. By means of this methodology develop the competitions A19 and A62
Lecturing	Classes in the classroom to the groups, where explain the corresponding contents to each subject. By means of this methodology develop the competitions A19 and A62

Personalized attention

Methodologies	Description
Autonomous problem solving	

Assessment

	Description	Qualification	Training and Learning Results
Problem solving	Practical supposition for his resolution. By means of this methodology evaluate the competitions A19 and A62	30	C9
Short answer tests	Proof with questions type test and of short answer, where the student will have to show the knowledge purchased. By means of this methodology evaluate the competitions A19 and A62	70	C9

Other comments on the Evaluation

Sources of information

Basic Bibliography

Complementary Bibliography

Recommendations