

## 25247 - Stream ecosystem

### Información del Plan Docente

<b>Academic Year</b>	2016/17
<b>Academic center</b>	201 - Escuela Politécnica Superior
<b>Degree</b>	277 - Degree in Environmental Sciences
<b>ECTS</b>	6.0
<b>Course</b>	
<b>Period</b>	Four-month period
<b>Subject Type</b>	Optional
<b>Module</b>	---

### **1.Basic info**

#### **1.1.Recommendations to take this course**

This subject is offered in the [English Friendly](#) form

#### **1.2.Activities and key dates for the course**

### **2.Initiation**

#### **2.1.Learning outcomes that define the subject**

#### **2.2.Introduction**

### **3.Context and competences**

#### **3.1.Goals**

#### **3.2.Context and meaning of the subject in the degree**

#### **3.3.Competences**

#### **3.4.Importance of learning outcomes**

### **4.Evaluation**

### **5.Activities and resources**

#### **5.1.General methodological presentation**

Theory sessions in which external expert communications are also included and participation is encourage.

Practical sessions consist of field, lab and study work with materials supplied by lecturers.

## 25247 - Stream ecosystem

### 5.2. Learning activities

The program offered to achieve the expected results include the next learning activities:

Theory sessions: Lectures introduce the main concepts and lines of the subject. In addition, most difficult issues will be reviewed thoroughly. Bibliography and auto-evaluation tools are provided. Readings and instructions for all practical exercises will be provided on the course website (moodle).

Practical sessions: Practical classes form part of the required activities for this course. If you miss a lecture or tutorial through illness or some other serious reason, it is your responsibility to attend an equivalent class from another stream. Some content and activities will not be available except by physically attending the classes, and missing material will disadvantage you in the course assessment.

### 5.3. Program

#### Theoretical Programme

The theoretical programme is as follows:

- Introduction.
- Resources and factors; distribution, abundance and availability of basic elements for life. Factors, resources and sub-products relating to organism activity in ecosystems. Autoecological limitations relating to abundance; resources and other varying factors. Asymptotic yield of resources. Limiting resources. Significance of metabolic sub-products in ecosystems. Importance of the vertical axis in the organisation of material space. Gradients of redox in nature.
- Fluvial systems and physical-chemical characteristics. The basin as a hydrological unit. Continental waters. Typology. The water cycle. Composition. Water flow. Substratum. Light and temperature. Dissolved gas. Inorganic carbon and pH regulation.
- Fluvial systems and biological characteristics. The dynamics of nutrients. Phosphorous as a limiting nutrient. Use of dissolved and particulate organic matter. Fluvial biofilm. Microbial loop. Consumers; shredders, collectors, grazers, predators. Integration of different factors along the river. The "river continuum concept." Variation of food chain characteristics along a fluvial gradient. Mediterranean rivers. Eutrophication. Micro-contaminants.
- Lake systems; dynamics, types and organisms. Causes of degradation and eutrophication.
- Reservoirs; dynamics and organisms. Impact.
- Marine ecosystem; littoral, benthic and pelagic zones. Food chain. Communities. Impact.

#### Practical Programme

The practical programme is as follows:

- Practical case study: interpretation, summary and presentation of a scientific article
- Primary production and predation. The importance of "bottom-up" and "top-down" controls within the food chain.
- The quality of water courses. Ecological status index; macroinvertebrates and chlorophyll. Field trip and practicals.
- Population census in nature. The effect of protection in natural aquatic ecosystems.
- Visits to a variety of aquatic ecosystems undergoing restoration projects.

### 5.4. Planning and scheduling

<b>TOTAL</b>	8	12	8	6	8	6	8	5	8	8	14	8	6	8	8	8	8	7			<b>150</b>
<b>Learning Activities/ week</b>	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	<b>Total</b>	

## 25247 - Stream ecosystem

<b>Face-to-face instruction</b>																					64
<b>Lectures</b>	2	2	2	2	2	2	2		2	2	2	2	2	2							30
<b>Lab</b>	2		2		2				2		2		2								14
<b>Field</b>		7,5								7,5											15
<b>Evaluation</b>														2					3		5
<b>Non-classroom instruction</b>																					86
<b>Individual work</b>	2,5	4	2,5	4	2,5	4	1,5	8	4	4	4	4	2,5	4	8	8	4				79,5
<b>Group work</b>			1,5		1,5		1,5						1,5								6

### 5.5. Bibliography and recommended resources

BB- Conceptos y técnicas en ecología fluvial / edición a cargo de Arturo Elosegi, Sergi Sabater . Bilbao : Fundación BBVA, 2009

BB- Invertébrés d'eau douce : systématique, biologie, écologie / [réalisé sous la direction de] Henri Tachet ; [en collaboration avec] Philippe Richoux ... (et al.) . - [1ª ed.] Paris : CNRS Éditions, cop. 2003

BB- Margalef, Ramón. Limnología / Ramón Margalef . [1a ed.] reimp. Barcelona : Omega, D.L. 1983 (reimp.2011)BB- Wetzel, Robert G.. Limnología / Robert G. Wetzel . Barcelona : Omega, D.L. 1981

BB- Allan, J. David. Stream ecology : structure and function of running waters / J. David Allan, María M. Castillo . 2nd ed. Dordrecht (Países Bajos) : Springer, cop. 2007

BB- Lampert, W., Sommer, U. (2007). Limnoecology of lakes and stream. New York: Oxford University Press

BC- Mitsch, W.J. (2007). Wetlands. New York: John Wiley & Sons

BC- Begon, Michael. Ecología : individuos, poblaciones y comunidades / Michel Begon, John L. Harper, Colin R. Townsend ; traducido por Miquel Riba Rovira, Raymond Salvador Civil . 3ª ed. Barcelona : Omega, D.L.1999

BC- Margalef, Ramón. Ecología / Ramón Margalef . 10a reimp. Barcelona : Omega, cop. 2005

BC- Dodds, W.K. (2010): Freshwater ecology: concepts and environmental applications of limnology. Academic Press