

## 250451 - PLAEXOXACA - Road Network Planning and Operation

Coordinating unit:	250 - ETSECCPB - Barcelona School of Civil Engineering
Teaching unit:	751 - DECA - Department of Civil and Environmental Engineering
Academic year:	2015
Degree:	MASTER'S DEGREE IN CIVIL ENGINEERING (PROFESSIONAL TRACK) (Syllabus 2012). (Teaching unit Optional) MASTER'S DEGREE IN CIVIL ENGINEERING (RESEARCH TRACK) (Syllabus 2009). (Teaching unit Optional)
ECTS credits:	5
Teaching languages:	Spanish

### Teaching staff

Coordinator: FELIX-EDMUNDO PEREZ JIMENEZ

Others: FELIX-EDMUNDO PEREZ JIMENEZ

### Degree competences to which the subject contributes

Specific:

8169. The ability to plan, manage and operate civil engineering infrastructure.

### Teaching methodology

The course consists of 1,5 hours per week of classroom activity (large size group) and 0,8 hours weekly with half the students (medium size group).

The 1,5 hours in the large size groups are devoted to theoretical lectures, in which the teacher presents the basic concepts and topics of the subject, shows examples and solves exercises.

The 0,8 hours in the medium size groups is devoted to solving practical problems with greater interaction with the students. The objective of these practical exercises is to consolidate the general and specific learning objectives.

The rest of weekly hours devoted to laboratory practice.

Support material in the form of a detailed teaching plan is provided using the virtual campus ATENEA: content, program of learning and assessment activities conducted and literature.

### Learning objectives of the subject

Specialization subject in which knowledge on specific competences is intensified.

Knowledge and skills at specialization level that permit the development and application of techniques and methodologies at advanced level.

Contents of specialization at master level related to research or innovation in the field of engineering.



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### Study load

Total learning time: 125h	Theory classes:	19h 30m	15.60%
	Practical classes:	9h 45m	7.80%
	Laboratory classes:	9h 45m	7.80%
	Guided activities:	6h	4.80%
	Self study:	80h	64.00%

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### Content

<p>1. Road networks. Planning, financing and management in Spain.</p>	<p>Learning time: 2h 24m Theory classes: 1h Self study : 1h 24m</p>
<p>Description: Introduction The Spanish road network. Organization, financing and management</p>	
<p>2. Pavements. Basic principles.</p>	<p>Learning time: 4h 48m Theory classes: 2h Self study : 2h 48m</p>
<p>Description: Road pavements. Types and characteristics Distress mechanisms and factors Pavement types and distress modes</p>	
<p>3. Pavement surface characteristics</p>	<p>Learning time: 10h 48m Theory classes: 3h 30m Laboratory classes: 1h Self study : 6h 18m</p>
<p>Description: Introduction Adherence Noise produced by vehicle circulation Surface roughness Optical characteristics</p>	
<p>4. Pavement design</p>	<p>Learning time: 21h 36m Theory classes: 2h Practical classes: 4h Laboratory classes: 3h Self study : 12h 36m</p>
<p>Description: Structural pavement design Experimental and analytical methods Exercises of flexible and rigid pavement design</p>	

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<p>5. Pavement auscultation</p>	<p>Learning time: 6h Theory classes: 2h 30m Self study : 3h 30m</p>
<p>Description: Auscultation Visual inspection Determination of pavement surface characteristics Determination of pavement mechanical characteristics</p>	
<p>6. Maintenance of flexible pavements</p>	<p>Learning time: 19h 12m Theory classes: 2h Practical classes: 3h Laboratory classes: 3h Self study : 11h 12m</p>
<p>Description: Pavement condition, diagnosis and decision making Ordinary conservation. Local repairs and small failures Pavement reinforcement exercises</p>	
<p>7. Maintenance of rigid pavements</p>	<p>Learning time: 4h 48m Theory classes: 2h Self study : 2h 48m</p>
<p>Description: Introduction Repair of local failures Surface rehabilitation Reinforcement and structural rehabilitation</p>	
<p>8. Pavement recycling</p>	<p>Learning time: 3h 35m Theory classes: 1h 30m Self study : 2h 05m</p>
<p>Description: Introduction Cold in place recycling Hot mix asphalt in plant recycling</p>	

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<p>9. Pavement management systems</p>	<p>Learning time: 20h 24m Theory classes: 2h 30m Practical classes: 3h Laboratory classes: 3h Self study : 11h 54m</p>
<p>Description: Pavement management systems Structure of a management system Benefits of implementation Exercises of management systems</p>	

### Qualification system

The mark of the course is obtained from the ratings of continuous assessment and their corresponding laboratories and exercises.

Continuous assessment consist in several activities, both individually and in group, of additive and training characteristics, carried out during the year (both in and out of the classroom).

The evaluation tests consist of a part with questions about concepts associated with the learning objectives of the course with regard to knowledge or understanding.

### Regulations for carrying out activities

Failure to perform a laboratory or continuous assessment activity in the scheduled period will result in a mark of zero in that activity.

### Bibliography

#### Basic:

Pérez, F.E.; Miró, R.; Martínez, A. Proyecto, conservación y gestión de firmes. Madrid: Asociación Española de la Carretera, 2007. ISBN 975-84-89875-71-5.

Huang, Y.. Pavement analysis.

Ministerio de Fomento. Norma 6.1 IC Secciones de firmes. 2003.

Ministerio de Fomento. Rehabilitación de firmes: instrucción de carreteras: Norma 6.3 IC. Madrid: Ministerio de Fomento. Dirección General de Carreteras, 2003. ISBN 8449806968.

#### Complementary:

Yoder, E.; Witczak, M.. Principles of pavement design.