Course guides
250451 - PLAEXOXACA - Road Network Planning and Operation

Unit in charge: Barcelona School of Civil Engineering
Teaching unit: 751 - DECA - Department of Civil and Environmental Engineering.

Degree: MASTER'S DEGREE IN CIVIL ENGINEERING (PROFESSIONAL TRACK) (Syllabus 2012). (Optional subject).

Academic year: 2020  ECTS Credits: 5.0  Languages: Spanish

LECTURER
Coordinating lecturer: JOSE RODRIGO MIRO RECASENS
Others: ADRIANA HAYDEE MARTINEZ REGUERO, JOSE RODRIGO MIRO RECASENS

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

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

Transversal:
8559. ENTREPRENEURSHIP AND INNOVATION: Being aware of and understanding the mechanisms on which scientific research is based, as well as the mechanisms and instruments for transferring results among socio-economic agents involved in research, development and innovation processes.
8560. SUSTAINABILITY AND SOCIAL COMMITMENT: Being aware of and understanding the complexity of the economic and social phenomena typical of a welfare society, and being able to relate social welfare to globalisation and sustainability and to use technique, technology, economics and sustainability in a balanced and compatible manner.
8561. TEAMWORK: Being able to work in an interdisciplinary team, whether as a member or as a leader, with the aim of contributing to projects pragmatically and responsibly and making commitments in view of the resources that are available.

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.

STUDY LOAD

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours medium group</td>
<td>9,8</td>
<td>7.83</td>
</tr>
<tr>
<td>Self study</td>
<td>80,0</td>
<td>63.95</td>
</tr>
<tr>
<td>Hours large group</td>
<td>19,5</td>
<td>15.59</td>
</tr>
<tr>
<td>Guided activities</td>
<td>6,0</td>
<td>4.80</td>
</tr>
<tr>
<td>Hours small group</td>
<td>9,8</td>
<td>7.83</td>
</tr>
</tbody>
</table>

Total learning time: 125.1 h

CONTENTS


Description:
Introduction
The Spanish road network. Organization, financing and management

Full-or-part-time: 2h 24m
Theory classes: 1h
Self study: 1h 24m


Description:
Road pavements. Types and characteristics
Distress mechanisms and factors
Pavement types and distress modes

Full-or-part-time: 4h 48m
Theory classes: 2h
Self study: 2h 48m
### 3. Pavement surface characteristics

**Description:**
- Introduction
- Adherence
- Noise produced by vehicle circulation
- Surface roughness
- Optical characteristics

**Full-or-part-time:** 10h 48m
- Theory classes: 3h 30m
- Laboratory classes: 1h
- Self study: 6h 18m

### 4. Pavement design

**Description:**
- Structural pavement design
- Experimental and analytical methods
- Exercises of flexible and rigid pavement design

**Full-or-part-time:** 21h 36m
- Theory classes: 2h
- Practical classes: 4h
- Laboratory classes: 3h
- Self study: 12h 36m

### 5. Pavement auscultation

**Description:**
- Auscultation
- Visual inspection
- Determination of pavement surface characteristics
- Determination of pavement mechanical characteristics

**Full-or-part-time:** 6h
- Theory classes: 2h 30m
- Self study: 3h 30m

### 6. Maintenance of flexible pavements

**Description:**
- Pavement condition, diagnosis and decision making
- Ordinary conservation. Local repairs and small failures
- Pavement reinforcement exercises

**Full-or-part-time:** 19h 12m
- Theory classes: 2h
- Practical classes: 3h
- Laboratory classes: 3h
- Self study: 11h 12m
7. Maintenance of rigid pavements

Description:
Introduction
Repair of local failures
Surface rehabilitation
Reinforcement and structural rehabilitation

Full-or-part-time: 4h 48m
Theory classes: 2h
Self study : 2h 48m

8. Pavement recycling

Description:
Introduction
Cold in place recycling
Hot mix asphalt in plant recycling

Full-or-part-time: 3h 35m
Theory classes: 1h 30m
Self study : 2h 05m

9. Pavement management systems

Description:
Pavement management systems
Structure of a management system
Benefits of implementation
Exercises of management systems

Full-or-part-time: 20h 24m
Theory classes: 2h 30m
Practical classes: 3h
Laboratory classes: 3h
Self study : 11h 54m

GRADING SYSTEM

The mark of the course will be obtained from the marks from both the continuous assessment and the supervised activity carried out during the semester.

Continuous assessment will consist in several tests about concepts associated with the learning objectives of the course with regard to knowledge or understanding.

The supervised activity, which can be individually or in group, of additive and training characteristics, will be carried out during the semester (both in and out of the classroom).

The final mark of the course will be obtained weighting the continuous assessment as 80% and the supervised activity as 20%. Students who do not attend any of the evaluation activities of the subject will not have a numerical mark and their qualification will be NP.
EXAMINATION RULES.

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:

Complementary: