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Coordinating unit: 250 - ETSECCPB - Barcelona School of Civil Engineering

Teaching unit: 751 - DECA - Department of Civil and Environmental Engineering

Academic year: 2018

Degree: BACHELOR'S DEGREE IN CIVIL ENGINEERING (Syllabus 2017). (Teaching unit Compulsory)
BACHELOR'S DEGREE IN CIVIL ENGINEERING (Syllabus 2010). (Teaching unit Compulsory)

ECTS credits: 6 Teaching languages: Catalan, Spanish, English

Teaching staff

Coordinator: PERE MACIAS ARAU

Others: PERE MACIAS ARAU, FRANCESC MAGRINYA TORNER, JOSEP MERCADÉ ALOY, ELISABETH ROCA BOSCH, DANIEL RODRIGUEZ ARANDA, ROBERT VERGES FERNANDEZ

Opening hours

Timetable: Monday, tuesday and thursday, morning. 202

Degree competences to which the subject contributes

Specific:

3063. Knowledge of the urban management regulatory framework. Understanding of the urban phenomenon and the factors determining it (history, economy, human activity, mobility). Understanding of and ability to draw up urbanisation projects.

3064. Knowledge of the influence of infrastructures on town and country planning enabling participation in the urbanisation of urban public space, and on plans for urban services and utilities such as water distribution, sewage disposal, waste management, transport systems, traffic, lighting, etc.

Generical:

3104. Students will learn to identify, formulate and solve a range of engineering problems. They will be expected to show initiative in interpreting and solving specific civil engineering problems and to demonstrate creativity and decision-making skills. Finally, students will develop creative and systematic strategies for analysing and solving problems.

3106. Students will learn to assess the complexity of the problems examined in the different subject areas, identify the key elements of the problem statement, and select the appropriate strategy for solving it. Once they have chosen a strategy, they will apply it and, if the desired solution is not reached, determine whether modifications are required. Students will use a range of methods and tools to determine whether their solution is correct or, at the very least, appropriate to the problem in question. More generally, students will be encouraged to consider the importance of creativity in science and technology.

3107. Students will learn to identify, model and analyse problems from open situations, consider alternative strategies for solving them, select the most appropriate solution on the basis of reasoned criteria, and consider a range of methods for validating their results. More generally, students will learn to work confidently with complex systems and to identify the interactions between their components.

3110. Students will learn to plan, design, manage and maintain systems suitable for use in civil engineering. They will develop a systematic approach to the complete life-cycle of a civil engineering infrastructure, system or service, which includes drafting and finalising project plans, identifying the basic materials and technologies required, making decisions, managing the different project activities, performing measurements, calculations and assessments, ensuring compliance with specifications, regulations and compulsory standards, evaluating the social and environmental impact of the processes and techniques used, and conducting economic analyses of human and material resources.

3112. Students will develop an understanding of the different functions of engineering, the processes involved in the

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life-cycle of a construction project, process or service, and the importance of systematising the design process. They will learn to identify and interpret the stages in preparing a product design specification (PDS), draft and optimise specifications and planning documents, and apply a systematic design process to the implementation and operation phases. Students will learn to write progress reports for a design process, use a range of project management tools and prepare final reports, and will be expected to show an awareness of the basic economic concepts associated with the product, process or service in question.
3113. Students will learn to identify user requirements, to draft definitions and specifications of the product, process or service in question, including a product design specification (PDS) document, and to follow industry-standard design management models. Students will be expected to show advanced knowledge of the steps involved in the design, execution and operation phases and to use the knowledge and tools covered in each subject area to the design and execution of their own projects. Finally, students will assess the impact of national, European and international legislation applicable to engineering projects.

Transversal:

585. ENTREPRENEURSHIP AND INNOVATION - Level 1. Showing enterprise, acquiring basic knowledge about organizations and becoming familiar with the tools and techniques for generating ideas and managing organizations that make it possible to solve known problems and create opportunities.
586. ENTREPRENEURSHIP AND INNOVATION - Level 2. Taking initiatives that give rise to opportunities and to new products and solutions, doing so with a vision of process implementation and market understanding, and involving others in projects that have to be carried out.
589. SUSTAINABILITY AND SOCIAL COMMITMENT - Level 2. Applying sustainability criteria and professional codes of conduct in the design and assessment of technological solutions.
594. TEAMWORK - Level 3. Managing and making work groups effective. Resolving possible conflicts, valuing working with others, assessing the effectiveness of a team and presenting the final results.
584. THIRD LANGUAGE. Learning a third language, preferably English, to a degree of oral and written fluency that fits in with the future needs of the graduates of each course.

Teaching methodology

The course is followed by notes ATENEA round the campus. The classes consist of an explanation by the teacher of the fundamentals and things that can be asked in the evaluation.

At the end of each module is a classroom assessment

The final grade will be deducted from the assessments and module exercises, and from the qualification of the course practice.

Do not keep note of modules partially approved at the end of the course.

Learning objectives of the subject

Students will acquire an understanding of how infrastructure influences land management. They will also learn to participate in the development of urban public space, as well as in urban services projects such as water distribution, sanitation, waste management, transport systems, traffic, lighting, etc., and acquire an understanding of the urban management regulation framework.

Upon completion of the course, students will have acquired the ability to: 1. Analyse an urban structure and identify the reasons for its development. 2. Analyse the development of regional infrastructure. 3. Analyse the development of networks of urban services.

Basic concepts of urban development and regional organisation; Urban morphology; Elements of the analysis of urban space; Infrastructure networks and city building; Land management; Networks of infrastructure, highways and railways;

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Networks of services, organisational logic, public space; Urban planning; Regional models; Urban sprawl; Urban structure and the effects of infrastructure; Analysis of networks; Transport networks; Service networks; Regional planning and networks

We should add a fourth capacity: 4.Saber read the planning documents.

Study load

Total learning time: 150h	Theory classes:	36h	24.00%
	Practical classes:	16h	10.67%
	Laboratory classes:	8h	5.33%
	Guided activities:	6h	4.00%
	Self study:	84h	56.00%

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Content

MODULE AND INDUSTRIAL TOWN PLANNING

Learning time: 33h 36m

Theory classes: 8h
Practical classes: 4h
Laboratory classes: 2h
Self study : 19h 36m

Description:

Assumptions about the origins of the modern city. The origins of the modern city: qualitative difference with the old cities. Background of modern urban planning: layout tools. The shape of the road network in the logic of fixing the alignments The first modern building regulations and urban police. The logic of the first building operations Burguess city: the tenant as a goal.

The concentration of production factors in the city and the emergence of the first urban services. The problems of cleanliness and public break: water supply and sewerage. The lighting and gas production in the city. An infrastructure almost disappeared: the telegraph. The revolution in urban transportation: trams and metropolitan: the revolution of electrification.

Expose how each type of infrastructure has led to a model city from concentrated and continual growth in the expanded territory, and how the planning is going to create different types of instruments and plans to establish order in each type of city. Thus, the city built by stretching of services (water, gas, tramways, sewers, ..) was regulated by Projects Eixample and the city that exploded on its territory as a result of the automobile and electricity was invented municipal planning. The timing of the evolution of the contemporary city and urban planning as exhibited proposed the passage of the compact city and continues, the city extended suburbs over the city fragmented estates in the metropolitan city and the city of dispersion.

4.- The environmental aspects of the city and the region. instruments

I. PERFORMANCE. Appraisal of four text about Urbanism Principles.

Specific objectives:

Objective of the lesson. Explain why the Planning, discipline emerged in the modern city, its relationship with the Property Law and the subsequent invention of infrastructure

Objective To understand how the successive inventions of urban infrastructure are going changing the type of city.

Objective: To understand the type of planning that was used in each of the periods of development of the city.

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MODULE II current levels of planning. URBAN MANAGEMENT

Learning time: 33h 36m

Theory classes: 8h
Practical classes: 4h
Laboratory classes: 2h
Self study : 19h 36m

Description:

Origins and legal framework. Content wanted, limitations and possibilities of planning. Defining the content of regional or territorial policies in metropolitan Western world; level of adequacy of our planning instruments. Framing of planning in urban legislation in Catalonia. Types of plans, content and current situation. The special problems of urban metropolitan areas. Brief analysis of the characteristics of government CON
Legal framework defining the planning, skills and bodies acting Content Plans General: general and organic structure and legal classification of land (urban land, urban and non urban) Rating soil: Applications and parameters of each type building. Planning rules. Critical aspects of mere regulation of urban planning and operation of their small immediate action. New perspectives on the utility of Municipal Urban Plans in a context of transformation of the type of city development plans of general urban planning. Type (Partial Plans and Urban Improvement Plans) and content
Systems planning to carry out action plans for development of urban planning. The Project for land subdivision as a means of regularization of properties and distribution of burdens and benefits of the urban operation. Criteria for completion of a proposed land subdivision. The provisional settlement has its effects. The list of projects for land subdivision and development.
Urban Rehabilitation and instrumental needs for its management. Strategic action plans for relaunching the economy of cities. The large-scale urban project: conditioned and features. Examples in the metropolitan city of Barcelona. The public-private coordination and institutional coordination. Transformations and possibilities for improving urban infrastructure: the example of the Llobregat Delta Plan.
The management of the rehabilitation of degraded areas and historic towns: experiences in Catalonia.

EJERCICI II Analyze and compare the contents and objectives of a Plan of Municipal Urban Planning and a Partial Plan chosen by the student and a same territory. Compare basically the level of precision required for infrastructure and construction.

Specific objectives:

Objective: To analyze the reasons of planning or land, the instruments that includes our legal framework. See the correspondence between objectives and means in the light of current concerns.
Objective: To analyze the reasons for the planning and, provides the tools our legal framework. See the correspondence between objectives and means in the light of current concerns, and perspectives of urban planning in the world.
Objective: an introduction to the mechanisms and instruments of land management, such as those listed in the legislation of other alternative practices used in the present town.
Objective: To analyze the mechanisms of management which deals with the current renewal of cities and their neighborhoods

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MODUL III THE REGIONAL SYSTEMS AND ALTERATION OF GEOGRAPHY. THE ROLE OF INFRASTRUCTURE

Learning time: 38h 24m

Theory classes: 8h
Practical classes: 4h
Laboratory classes: 4h
Self study : 22h 24m

Description:

Introduction to the physical-geographical analysis. Defining an invariant region. Relief and slope. Hydrographic basins and slopes. Coast and coastal area. The concept of landscape. Systems of human settlements and the use of land. Functional Hierarchy between settlements, concepts and field raft of influence. Attempts at modeling systems developed and stable settlements (Cristalher and LOSH) and its applications in regional decisions.
The deformation of the geographic territory for the introduction of infrastructure, the example of the conformation of the Catalan territory. The territorial systems: a network of roads, railways, transport terminals, network, network, water supply, power grids and telecommunications. Characteristics and perspectives of infrastructure networks in Catalonia. Natural systems: types and protection tools
Evolutionary characteristics of transport networks. Importance as a new variant of territorial organization. Network topology, knots and centralities. Territorial analysis from graph theory: fundamental concepts of simplification instrumental territory (center and centroid, radius and arc). Indicators useful in applications of graph theory: centrality, accessibility and coverage. Application examples. Fractal theory and its application to the evolution of networks. Application examples
Laboratory 1. Examples of calculation and measurement of network effects (Graph Theory and Fractals theory): measurement indicators territorial potential (accessibility, continuity, isotropy, etc..)
EJERCICI III: Detecting the invariant region of topographic and infrastructure analyze how they affect the potential initial advantage.

Specific objectives:

Objective: To understand the region as constructed from urban settlements and infrastructure. Power handling concepts and spatial analysis tools, essentially invariant geographical territory
Objective: To analyze how the infrastructure has changed the potential of a territory, from the formation of the Catalan territory. Classify and define the various infrastructure systems that make up the territory ..
Objective: Study methods and tools for analyzing and infrastructure have changed the territory. Apply measuring instruments. Understanding the territory from the networks and the fundamental concepts of graph theory and fractal theory.

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THE DRAFT OF THE MODULE IV INFRAESTRUCTURAS Urban	Learning time: 38h 24m Theory classes: 8h Practical classes: 4h Laboratory classes: 4h Self study : 22h 24m

Description:

Construction dl'espai public and urbanization. Analysis of the functions of the urban street. Type of streets. Patterns and characteristics of urban streets. Streets establishing the basic structure of the city. Elements of the proposed public space. Geometry of street requirements and tools of composition. Materials and components for surface ordering.
The infrastructure development: legal requirements and customary practices. Infrastructure water cycle and its reflection in the estate. Conditions leading telecommunications and energy infrastructures. The lighting, design criteria and installation. The system of open spaces and trees. The records of the services.
Gradualitat and survival in building service networks; gradualitat meanings of the concept. The levels of urbanization and economic development. The possibility of building low levels satisfactory. Comparison of basic levels and standards for each service. The conditions of the site as a particular type of intervention. Examples of application of the concepts mentioned in the regularization process of urbanization marginal.

Laboratory 2 Sizing of current and proposed street section amended
EJERCICI IV: Analyzing a neighborhood, asking what are their infrastructure and which could be from a more functional and lower environmental costs.

Specific objectives:

Objective: Understand the project dimension and urban infrastructure from the perspective of their integration and their common intention to build a particular urban space: the type of street from their urban environment.
Objective: Overcoming functional vision can only be given in other subjects. Analyze alternative development than usual, from a perspective of integration

Objective: Understand how infrastructure elements of city building, with different possibilities of intervention and as an cumulative gradualitat process.

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Qualification system

The qualification of subject is obtained from continuous assessment grades or a final exam. Continuous assessment involves different activities, additive and formative character, made during the course (in the classroom and outside of it). It consists of four individual tests in the classroom (E1, E2, E3, E4 i) and 4 modular practices to be done individually outside the classroom. The modular qualification Mi=0,6Ei+0,4Pi
After the collective visit, another practice must be deliver. (L)
The final (QF) of the subject by continuous assessment is determined by the following formula: QF = {0.2M1 + 0.2M2 + 0.2M3 + 0.2M4 + 0.2 L}.
The final (QF) of the subject in which the student chooses to only one final exam will be QF = EF, where EF is a comprehensive review of the whole subject.
Students will be able to choose to be assessed by continuous assessment or final exam before the exam conducting E4.
Throughout the course you can perform various practical exercises, not computed on tests of control but serve to enhance the final grade. These exercises are voluntary.

Criteria for re-evaluation qualification and eligibility: Students that failed the ordinary evaluation and have regularly attended all evaluation tests will have the opportunity of carrying out a re-evaluation test during the period specified in the academic calendar. Students who have already passed the test or were qualified as non-attending will not be admitted to the re-evaluation test. The maximum mark for the re-evaluation exam will be five over ten (5.0). The non-attendance of a student to the re-evaluation test, in the date specified will not grant access to further re-evaluation tests. Students unable to attend any of the continuous assessment tests due to certifiable force majeure will be ensured extraordinary evaluation periods.

These tests must be authorized by the corresponding Head of Studies, at the request of the professor responsible for the course, and will be carried out within the corresponding academic period.

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.

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