

IDENTIFICATION DETAILS

Degree:	Architecture			
Scope	Architecture, construction, building and urban planning, and civil engineering			
Faculty/School:	Higher Polytechnic School			
Course:	INFORMATION TECHNOLOGY (CALCULUS)			
Туре:	Optional		ECTS credits:	3
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Year:	5		Code:	3767
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Teaching period:	Tenth semester			
Subject:	Projects			
Module:	Projectual			
Teaching type:	Classroom-based			
Language:	Spanish			
Total number of student study hours:	75			

SUBJECT DESCRIPTION

Mastering the digital environment is essential to configure the professional profile of the current architect. Information technology has established itself as the main tool for the development of professional activity. In the case of structural calculation, it offers the possibility of evaluating within a reasonable time the goodness of the proposed solutions and their possible alternatives.

For the student, it is an excellent way to verify the goodness of the results obtained through manual calculations and, even more, to acquire theoretical experience because it allows quick results as a response to the various options available.

Given the friendly environments of current structural calculation programs, learning can be a productive game. In the case of this subject, it has been decided to use as a reference the calculation programs of the specialized firm CYPE Ingenieros SA because they are the most widely distributed commercial programs in Spain.

GOAL

Apply structural design and calculation theory by learning the use of computer verification tools

Experiment in estimating results with rapid methods of approximating them.

Familiarize yourself with the usual professional development environment in the structural field.

PRIOR KNOWLEDGE

To study this subject it is advisable Have passed the basic subjects in the area of career structures (Structures I and II).

It can be combined with development subjects in the same area (Structures III, IV and Geology, Geotechnics and Foundations). This simultaneity can facilitate the learning of these subjects.

It is also advisable to be familiar with the computer work environments of specialized programs.

COURSE SYLLABUS

TOPIC 1. The IT environment.

TOPIC 2. Previous structural definition. Concepts

TOPIC 3. Providing data to the program.

TOPIC 4. Interpretation of results.

TOPIC 5. Editing and modifying results. Recalculations.

TOPIC 6. Organization of information and drafting of structural plans.

TOPIC 1.

1.1. Choice of the appropriate program for the analysis of the planned structure.

1.2. Menu screens. File Management

TOPIC 2.

- 2.1. Conceptual definition of the projected structure.
- 2.2. Geometric definition of the same.
- 2.3. Definition of knots, materials, coefficients
- 2.4. Critical view of the supposed structure

TOPIC 3.

3.1. Entering general data. Materials, combinations, environment, number of plants and general actions

3.2. Introduction of the vertical structure. Walls, pillars, screens.

- 3.3. Definition of the horizontal structure by individual plants or plant groups.
- 3.3.1. Definition of contours.

- 3.3.2. Definition of beams.
- 3.3.3. Definition of cloths (unidirectional or bidirectional forged).
- 3.3.4. Definition of special loads
- 3.4. Definition of the foundation
- 3.4.1. Surface foundation with footings and beams
- 3.4.2. Surface foundation with slabs.
- 3.4.3. Deep piloting foundation.
- 3.4.4. Containment structures. Definition of thrusts.

TOPIC 4.

- 4.1. Evaluation of the errors indicated by the program
- 4.2. Aspects to check. ELU and ELS compliance
- 4.3. What aspects can be modified without recalculating

TOPIC 5.

- 5.1. Editing and modifying reinforced concrete beams
- 5.2. Editing and modification, if appropriate, of metal beams
- 5.3. Editing and modifying column arrays
- 5.4. Editing and modification, if appropriate, of metal pillars
- 5.5. Editing and modifying wall structures.
- 5.6. Editing and modifying forged weapons. Base armed.
- 5.7. Editing and modifying the assembly of shoes, slabs and plaques
- 5.8. Editing and modifying the assembly of containment elements

THEME 6

- 6.1. Selection of results.
- 6.2. Importing results
- 6.3. Organizing plans
- 6.4. Incorporation of details

EDUCATION ACTIVITIES

1. In-person activities

1.1. Theoretical and practical classes. In each topic, the teacher will address the theoretical concepts and their immediate practical application that need to be known. Students will actively and practically participate in the application of concepts and procedures. The teacher will answer any questions they may have.

1.2. Performing exercises. All classes will be of a practical nature and will be conducted simultaneously by teacher and students.

1.3. Evaluation controls. During the course, small exercises will be carried out continuously to verify the students' assimilation of the concepts discussed. Given the characteristics of the subject and the means used, monitoring and evaluation of the student's work and knowledge can be carried out by remote procedures. In this case, at least, the evaluation tests will be carried out on common works with individualized starting parameters for each student.

1.4. Tutorials

1.4.1. Personalized. Individualized attention to the student in order to clarify doubts that the student does not understand during their personal work.

1.4.2. From a group. Attention to groups of students who need additional help on specific issues for the monitoring of the subject.

2. Non-face-to-face activities

2.1. Continuation and supplementation of the exercises started in the classroom. In the next class, students will present their progress, which will be submitted to analysis by the whole class, led by the teacher.

2.2. Preparation, by groups of students, on topics or exercises for presentation in class. Attention to and assimilation of what has been explained in class will be encouraged through the preparation by groups of brief summaries of partial topics of the subject.

DISTRIBUTION OF WORK TIME

TEACHER-LED TRAINING ACTIVITIES	INDIVIDUAL WORK		
30 Horas	45 Horas		

SKILLS

Basic Skills

Students must have demonstrated knowledge and understanding in an area of study that is founded on general secondary education. Moreover, the area of study is typically at a level that includes certain aspects implying knowledge at the forefront of its field of study, albeit supported by advanced textbooks

Students must be able to apply their knowledge to their work or vocation in a professional manner and possess skills that can typically be demonstrated by coming up with and sustaining arguments and solving problems within their field of study.

Students must have the ability to gather and interpret relevant data (usually within their field of study) in order to make judgments that include reflections on pertinent social, scientific or ethical issues

Students must be able to convey information, ideas, problems and solutions to both an expert and non-expert audience

Students must have developed the learning skills needed to undertake further study with a high degree of independence

Ability to solve problems and to take decisions.

Ability to apply procedures.

An understanding of the problems involved in structural design, construction and engineering associated with building projects.

General Skills

Ability to solve problems and to take decisions.

Ability to apply procedures.

An understanding of the problems involved in structural design, construction and engineering associated with building projects.

Specific skills

Aptitude for the conception, practice and development of basic and execution projects, sketches and preliminary projects. (T)

Aptitude for the conception, practice and development of urban projects. (T)

Aptitude for the conception, practice and development of construction management. (T)

LEARNING RESULTS

Design the structure of a building and define its computer model.

Analyze the results obtained with a critical view of them, selecting and organizing the information obtained.

Generate the necessary plans to define the projected structure.

The course can be approved:

BY COURSE (Continuous Assessment):

This course is based on continuous evaluation that will lead to the successful one

- Proving regular attendance: It is essential to attend at least 80% of classes.

- Demonstrating sufficient knowledge of the subject throughout the course

This sufficiency will be accredited by obtaining a grade equal to or greater than 5 as a weighted average of the result of the partial grades obtained from:

- The control exams that will be taken during the semester (50% of the overall score). Given the characteristics of the subject and the means used, the monitoring, control and evaluation of the student's work and knowledge can be carried out by remote procedures. In this case, the evaluation tests will be carried out on common works with individualized starting parameters for each student.

- The exercises performed in class and their extension outside of class (40% of the overall grade)

- It is mandatory to complete 75% of the proposed exercises. If you do not submit an exercise, your score will be 0 and will be averaged with the rest.

- An exercise will be considered delivered when it is delivered in a timely manner in accordance with the provisions of each statement, which will also include the evaluation criteria.

- With a view to the evaluation, late deliveries or improvements to the exercises delivered will not be accepted. However, if they are carried out, they can be analyzed in individual or group tutorial spaces.

- Active and relevant participation in theoretical and practical classes. (10% of the overall grade) EVALUATION IN AN ORDINARY CALL

Students who do not pass the course or do not complete it will be eligible for an exam in the ordinary call. The exam will cover the whole of the subject and your grade will be the one obtained in it.

In this subject, students are allowed to have books, notes and exercises in the exams, since the intention is to be able to answer the questions posed under the same conditions as they will do in the future in the professional field. For this reason, in the event that face-to-face exams are not possible, tests may be carried out, with a sufficient degree of reliability, on a remote system, video-monitored and recorded, on common statements with individualized parameters

EVALUATION IN AN EXTRAORDINARY CALL

Students who do not pass the course or do not complete it will be eligible for an exam in the extraordinary call. The exam will cover the whole of the subject and its grade will be the one obtained in it and the criteria and method of completion will be the same as in the ordinary call, either in person or remotely.

In this subject, students are allowed to use books, notes, exercises and spreadsheets like Excel during the exams, since the intention is to be able to answer the questions posed under the same conditions as they will do in the future in the professional field without the memory to remember formulation or operational repetitiveness acquiring a fundamental character in the result of the test. However, the use of applications that automatically provide the conceptual and/or quantitative result of some question (s) requested in the statements, as well as any form of plagiarism, is prohibited. Plagiarism, as well as the use of illegitimate means in evaluation tests, will be sanctioned in accordance with the University's Evaluation Regulations and Coexistence Regulations. In the case of remote tests, any violation of the general protocol established by the university or specific to the subject is prohibited and, if this occurs, the official regulations of the UFV existing for this purpose will apply to the student.

ETHICAL AND RESPONSIBLE USE OF ARTIFICIAL INTELLIGENCE

1.- The use of any Artificial Intelligence (AI) system or service shall be determined by the lecturer, and may only be used in the manner and under the conditions indicated by them. In all cases, its use must comply with the following

principles:

a) The use of AI systems or services must be accompanied by critical reflection on the part of the student regarding their impact and/or limitations in the development of the assigned task or project.

b) The selection of AI systems or services must be justified, explaining their advantages over other tools or methods of obtaining information. The chosen model and the version of AI used must be described in as much detail as possible.

c) The student must appropriately cite the use of AI systems or services, specifying the parts of the work where they were used and describing the creative process followed. The use of citation formats and usage examples may be consulted on the Library website(<u>https://www.ufv.es/gestion-de-la-informacion_biblioteca/</u>).

d) The results obtained through AI systems or services must always be verified. As the author, the student is responsible for their work and for the legitimacy of the sources used.

2.- In all cases, the use of AI systems or services must always respect the principles of responsible and ethical use upheld by the university, as outlined in the <u>Guide for the Responsible Use of Artificial Intelligence in Studies at UFV</u>. Additionally, the lecturer may request other types of individual commitments from the student when deemed necessary.

3.- Without prejudice to the above, in cases of doubt regarding the ethical and responsible use of any AI system or service, the lecturer may require an oral presentation of any assignment or partial submission. This oral evaluation shall take precedence over any other form of assessment outlined in the Teaching Guide. In this oral defense, the student must demonstrate knowledge of the subject, justify their decisions, and explain the development of their work.

BIBLIOGRAPHY AND OTHER RESOURCES

Basic

Antonio Manuel Reyes Learning manual for calculating metal and reinforced concrete structures with CYPECAD Anaya multimedia ISBN: 978-84-415-4356-0

Additional

Ministry of Housing. Government of Spain Technical Building Code BOE ISBN: 9788430971701

Ministry of the Presidency and Relations with the Courts. Government of Spain Structural Code BOE ISBN: 9788449810640