

Course file

Study cycle	BACHELOR IN CIVIL ENGINEERING		
Course	COMPUTER SCIENCE AND PROGRAMMING	Mandatory	<input checked="" type="checkbox"/>
		Optional	<input type="checkbox"/>
Course scientific area	CIVIL ENGINEERING	Category	B

Course category: B - Basic; C - Core Engineering; E - Specialization; P - Complementary.

Year: 1st	Semester: 1st	ECTS: 4,0		Total: 108
Contact time	T:	TP: 45	PL:	S:
				OT:

T - Lectures; TP - Theory and practice; PL - Lab Work; S - Seminar; OT - Tutorial Guidance.

Course Director	Title	Position
Cristina Coutinho	Mestre	Professor Adjunto

Learning objectives (knowledge, skills and competences to be developed by students)

(max. 1000 characters)

Objectives: Provides expert skills and advanced analysis techniques to build and explore spreadsheet models. Also provides the basic subject areas of a first course on algorithms, data structure and programming methods using a high level programming language, in order to solve Civil Engineering problems.

Skills and competences to be developed by students: Ability to analyse a problem and create an according spreadsheet model; ability to explore the spreadsheet model; understanding programming fundamentals; ability to analyse a problem and develop an according algorithm; ability to apply a structured top-down design to computer programming problems.

Syllabus

(max. 1000 characters)

1. Spreadsheet environment

1.1 Editing, formatting, data validation and data protection.

1.2 Formulas and functions; search and reference functions.

1.3 Database design: database functions; sort, filter and group; pivot tables.

1.4 Charts; pivot charts.

1.5 Exchanging data.

2. Algorithms and programming

2.1. Computer language fundamentals: program development; program structure; constants and variables; data types; arithmetic expressions and operators.

2.2 Decision and Loop statements.

2.3 Sub-Programs: global and local variables; parameters.

2.4 Structured variables: performing search operations with subscripted variables; sorting.

2.5 Files: defining text files; reading and writing data in text files.

Demonstration of the consistency between the syllabus and the course objectives

(max. 1000 characters)

Topics in the syllabus are introduced following a growing complexity. This allows students to achieve a growing knowledge of the spreadsheet environment and also to gradually master programming concepts developing the ability to analyse and design proposed projects.

Teaching methodology (evaluation included)

(max. 1000 characters)

All knowledge is given through illustrative examples. All these examples are followed by similar exercise proposals to be worked by students, allowing new information to be studied, implemented and verified. Students are required to work by themselves.

Assessment includes a final individual test (50%) and a team project (50%).

Demonstration of the consistency between teaching methodology and the course learning objectives

(max. 3000 characters)

Topics are introduced following a growing complexity always through illustrative examples. All examples are followed by exercise proposals to be solved by students.

Teaching methodology is directed towards learning objectives which are: achieving expert skills in spreadsheet modeling and understanding a programming language in order to be able to analyse, structure and implement a Civil Engineering program.



INSTITUTO SUPERIOR DE ENGENHARIA DE LISBOA



ÁREA DEPARTAMENTAL DE ENGENHARIA CIVIL

Main Bibliography

(max. 1000 characters)

C.Coutinho, A.Martins, P.Mateus, "Informática e Programação", Folhas de apoio à UC, página do moodle de IP, 2011/12;

<http://www.gcflearnfree.org/excel2013/>