



Academic year	2016-17
Subject	20302 - Programming - Computer Studies I
Group	Group 95, 1S, GEIN, GIN2
Teaching guide	AU
Language	English

Subject identification

Subject	20302 - Programming - Computer Studies I
Credits	2.4 de presencials (60 hours) 3.6 de no presencials (90 hours) 6 de totals (150 hours).
Group	Group 95, 1S, GEIN, GIN2 (Campus Extens)
Teaching period	First semester
Teaching language	English

Professors

Lecturers	Horari d'atenció als alumnes					
	Starting time	Finishing time	Day	Start date	Finish date	Office
Cristina Suemay Manresa Yee cristina.manresa@uib.es	11:30	12:30	Tuesday	12/09/2016	28/02/2017	221
	12:00	13:00	Thursday	30/01/2017	31/07/2017	221

Contextualisation

This is an introductory course in the Degree in Computer Engineering. It is a first-year course and it is given in the first semester.

This course introduces the essentials of programming. Specifically, the course focuses on the algorithmic process, in which students will learn how to design solutions for sequential problems applying top down approaches and using abstract concepts for operations and data, which will ensure high quality and efficient solutions with easy-to-read and easy-to-maintain code.

Further, the course is closely related to other courses in the computing module and to any course focused on developing algorithms in any programming language or environment.

Requirements

Recommendable

Previous knowledge on using the computer at user level and skills searching information on the web and using office tools to write reports are recommended

Skills

Students may consult the basic competences to achieve by the end of the degree at the following address: http://estudis.uib.cat/ca/grau/comp_basiques/





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Specific

- * CFB03: Basic knowledge on the use and programming of computers, operating systems, databases and software.

Generic

- * CTR01. Develop skills for analysis and synthesis, organization, planning and decision-making..
- * CTR07: Ability to communicate effectively computer science concepts both orally and writing in different contexts.

Basic

- * You may consult the basic competencies students will have to achieve by the end of the degree at the following address: <http://www.uib.eu/study/grau/Basic-Competences-In-Bachelors-Degree-Studies/>

Content

Theme content

1. Fundamentals

Definitions of the computer components depending on the tasks they carry out and their relationship with the software. Definition of the concept of program and its relationship with the hardware that runs it. Definition and types of programming languages. Description of the designing process of a program and the program's structure.

2. Language components

A program will be divided into two blocks: a declarative block that defines the necessary elements to implement the program and a block of instructions where we find the precise instructions to solve the problem.

Variables: definition and primitive data types. Initialization, declaration and assignment of variables.

Operators and types of operations.

Basic input and output functions.

Composition of operations: sequence, conditional and iterative statements

3. Basic sequential algorithms

The sequence concept and examples of sequential problems of different nature. General schemes for processing sequences: traverse and search.

4. Application of basic schemes for solving complex problems

Subprograms, abstraction and top-down approach.

Parameters and arguments. Scope and visibility. Local and global variables

5. Data types and operations defined by the developer

Elementary and composite data types.

Abstract data types. Encapsulation. Classes and objects

6. Design approaches



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Top-down approach

- 7. Input and output files
 - File organization and I/O to files
 - Text files

Teaching methodology

Campus Extens will be used for hosting course materials and the homework assignment files, as well as links to readings and useful references. It will also be used for communication purposes and for assignment submission and feedback.

In-class work activities

Modality	Name	Typ. Grp.	Description	Hours
Theory classes	Lectures	Large group (G)	Oral presentations given by the instructor on the theory of the course and examples of algorithms. There will be 15 lessons of two hours and 8 of one hour	45
Practical classes	Practical assignments/ Group project	Medium group (M)	Students will solve practical problems with the help of the instructor. The aim is to facilitate the understanding of the theoretical concepts as well as introducing the students into the practical aspects of the course. The practical lessons will use Java as the programming language. There will be 15 lessons (of 1 or 2 hours)	15

At the beginning of the semester a schedule of the subject will be made available to students through the UIB digital platform. The schedule shall at least include the dates when the continuing assessment tests will be conducted and the hand-in dates for the assignments. In addition, the lecturer shall inform students as to whether the subject work plan will be carried out through the schedule or through another way included in the Campus Extens platform.

Distance education work activities

Modality	Name	Description	Hours
Group or individual self-study	Project	Students, individually or by pairs, will work on a practical assignment that will bring all theoretical components together	45
Group or individual self-study	Study	Students will study the theoretical concepts and train their programming skills	45

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Specific risks and protective measures

The learning activities of this course do not entail specific health or safety risks for the students and therefore no special protective measures are needed.

Student learning assessment

The course grade will be based on the assessment criteria and the evaluation itinerary.

Itinerary A is the standard one which implies continuous evaluation, while itinerary B is for those students who for one reason or another cannot attend lectures regularly. Students in the itinerary A will count with an extra task that will be the 10% of the grade, and this one will be self-assessed by the students.

Students who need to be in the itinerary B, will sign a pedagogical contract with the instructor within the first 3 weeks of the course.

The grade for each assessment activity will be between 0 and 10, and each part will have a certain weight for the final grade. Students need to achieve a minimum grade of 5 in all the retrievable assessment activities. Otherwise, they will have to repeat those activities in the appropriate period.

All students violating the ethics code (eg. plagiarism, cheating, etc.) will result in failure for the course.

Practical assignments/ Group project

Modality	Practical classes
Technique	Self-assessment systems (non-retrievable)
Description	Students will solve practical problems with the help of the instructor. The aim is to facilitate the understanding of the theoretical concepts as well as introducing the students into the practical aspects of the course. The practical lessons will use Java as the programming language. There will be 15 lessons (of 1 or 2 hours)
Assessment criteria	Evaluation of CFB03, CTR01 and CTR07
Final grade percentage:	10% for the training plan A
Final grade percentage:	0% for the training plan B

Project

Modality	Group or individual self-study
Technique	Student internship dissertation (retrievable)
Description	Students, individually or by pairs, will work on a practical assignment that will bring all theoretical components together
Assessment criteria	Evaluation of CFB03, CTR01 and CTR07
Final grade percentage:	45% for the training plan A with minimum grade 5
Final grade percentage:	50% for the training plan B with minimum grade 5

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Study

Modality	Group or individual self-study
Technique	Objective tests (retrievable)
Description	Students will study the theoretical concepts and train their programming skills
Assessment criteria	Exam.Evaluation of CFB03 and CTR07

Final grade percentage: 45% for the training plan A with minimum grade 5

Final grade percentage: 50% for the training plan B with minimum grade 5

Resources, bibliography and additional documentation

Ad hoc material will be prepared and uploaded to Campus Extens.

However, students can use the next support material:

Basic bibliography

- * García, J., Montoya, F., Fernández, J., Majado, M., "Una Introducción a la Programación", Thomson Paraninfo, 2005
- * Abasolo, M.J., Perales, F. J., "Introducción a la Programación", Colección Material Didáctica 147. UIB 2011.
- * Llemosí, Albert., "A Primer on Program Construction", (apuntes pendents de publicació. Disponibles a les copisteries de la Universitat).

Complementary bibliography

- * Joyanes Aguilar, L., "Fundamentos de Programación: Algoritmos, estructura de datos y objetos", McGraw Hill, 4ª Ed. 2008
- * Muñoz Frias, J.D., Palacios Hielscher, R., "Fundamentos de programación utilizando el lenguaje C". Madrid : Universidad Pontificia de Comillas, 2006
- * Kernighan, B.W., Ritchie, D.M., "El lenguaje de programación C" ; Prentice-Hall Hispanoamericana, 1991

Other resources

- * Sahami, M. "Programming Methodology". Stanford University. Vídeo podcast a iTunes U

