

**1. General information****Course:** PROGRAMMING FUNDAMENTALS II**Type:** BASIC**Degree:** 346 - DEGREE IN COMPUTER SCIENCE AND ENGINEERING**Center:** 604 - SCHOOL OF COMPUTER SCIENCE AND ENGINEERING (AB)**Year:** 1**Main language:** Spanish**Use of additional languages:****Web site:****Code:** 42306**ECTS credits:** 6**Academic year:** 2019-20**Group(s):** 10 11 12 13 14**Duration:** C2**Second language:** English**English Friendly:** N**Bilingual:** Y**Lecturer:** MARIA DE LOS LLANOS ALONSO DIAZ-MARTA - Group(s): 10 11 12

Building/Office	Department	Phone number	Email	Office hours
Agrupación Politécnica /1.C.10	SISTEMAS INFORMÁTICOS	2395	maria.alonso@uclm.es	Consultar: http://esiiab.uclm.es/tutorias.php

Lecturer: MARIA JULIA FLORES GALLEG0 - Group(s): 10 11 12 13

Building/Office	Department	Phone number	Email	Office hours
ESII/0.C.15	SISTEMAS INFORMÁTICOS	2438	julia.flores@uclm.es	http://esiiab.uclm.es/pers.php?codpers=julia

2. Pre-Requisites

Students are expected to have already acquired knowledge and experience in basic programming skills. The next concepts should have been known and understood: variables, assignments, operators, expressions, functions (argument passing and return of values), control structures and data structures (vectors, records). These concepts have already been incorporated and developed in the subject Programming Fundamentals I -- Fundamentos de Programación I (first year, first semester).

3. Justification in the curriculum, relation to other subjects and to the profession

As its name indicates, Programming Fundamentals II, it will be the second part in this year to study basics of programming. It will cover the fundamental concepts and skills of programming, in this particular case object-oriented programming (OOP). This methodology is a keystone for the academic training of our students, in a two-fold way: in order to acquire the necessary basis for studying more advanced courses within the degree, but also aiming at their professional life. In this subject, event-driven programming is also introduced, and the students learn how to apply it for a particular set of defined problems. Students are also taught the possibility of creating by themselves computer applications from the perspective of OO paradigm.

4. Degree competences achieved in this course**Course competences**

Code	Description
BA4	Basic knowledge about the uses and programming of computers, operating systems, data bases, and digital programmes with applications in engineering.
BA5	Knowledge about the structure, organization, functioning, and inter connexions of digital programmes, with their application in engineering problems.
INS4	Problem solving skills by the application of engineering techniques.
SIS1	Critical thinking.
SIS3	Autonomous learning.
UCLM2	Ability to use Information and Communication Technologies.

5. Objectives or Learning Outcomes**Course learning outcomes****Description**

Application of basic principles of structured design, led to objects for problem solving.

Development of programmes throughout the use of a programming paradigm led to objects and by events.

6. Units / Contents**Unit 1: Introduction: Fundamental concepts of Object-Oriented Programming (OOP)****Unit 2: Object-Oriented Programming****Unit 3: Exception handling****Unit 4: Introduction to event-driven programming****7. Activities, Units/Modules and Methodology**

Training Activity	Methodology	Related Competences (only degrees before RD)	ECTS	Hours	As	Com	R	Description
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Class Attendance (theory) [ON-SITE]	Lectures	BA4 BA5 INS4 SIS1 SIS3 UCLM2	0.72	18	Y	N	N	Classroom (big/whole group)
Problem solving and/or case studies [ON-SITE]	Problem solving and exercises	BA4 BA5 INS4 SIS1 SIS3 UCLM2	0.72	18	Y	N	N	Classroom (big/whole group)
Computer room practice [ON-SITE]	Practical or hands-on activities	BA4 BA5 INS4 SIS1 SIS3 UCLM2	0.64	16	Y	N	N	Laboratory (lab/small groups). Working on lab assignments from the corresponding lab-guide document. To be assessed in the part of 'participation and merit-based attendance', quizzes might be used. This would be answered individually, and every quiz could cover 3-5 lab assignments, being this activity non-compulsory. In order to be eligible to take those quizzes, it would be a requirement that the student attended all the associated lab sessions.
Final test [ON-SITE]	Assessment tests	BA4 BA5 INS4 SIS1 SIS3 UCLM2	0.16	4	Y	Y	Y	The final test will be a written exam (corresponding to 70 points, out of 100 of the final grade). Optionally, the students could sit a mid-term exam (to be held during the afternoon, in a timetable slot common to the four groups, and this exam would need minimum 2 hours to be done). With this option, if the student passes the mid-term exam (equal or greater than 50%) the final exam will be replaced by a final-term exam (focused on the last lessons) and the corresponding final grade would be the average of both (mid and final terms), as long as the second exam (final-term one) is at least 40 points out of 100.
Final test [ON-SITE]	Assessment tests	BA4 BA5 INS4 SIS1 SIS3 UCLM2	0.16	4	Y	N	N	Laboratory tests. The student must have done the lab assignments published until the given moment, and s/he must have worked on the associated tasks. This is a requirement because the lab tests will normally be based on those assignments and their solutions, which must be personal.
Practicum and practical activities report writing or preparation [OFF-SITE]	Project/Problem Based Learning (PBL)	BA4 BA5 INS4 SIS1 SIS3 UCLM2	1.04	26	Y	N	N	[INF] This is individual work to write the documentation associated to each lab assignment.
Study and Exam Preparation [OFF-SITE]	Self-study	BA4 BA5 INS4 SIS1 SIS3 UCLM2	2.56	64	N	-	-	Self-study and in-depth analysis of the subject topics. Exercise solving. Lab assignments completion. Self-preparation for exams
Total:			6	150				
Total credits of in-class work: 2.4			Total class time hours: 60					
Total credits of out of class work: 3.6			Total hours of out of class work: 90					

As: Assessable training activity

Com: Training activity of compulsory overcoming

R: Rescheduling training activity

8. Evaluation criteria and Grading System			
Evaluation System	Grading System		Description
	Face-to-Face	Self-Study Student	
Final test	70.00%	0.00%	Written exam. Assessment of knowledge acquired in classroom and lab by a final test. Students can opt for a voluntary mid-term exam. In this case, given that the student got at least 50% of the grade, s/he can sit a final-term exam instead of the FINAL EXAM (covering all the course). Students who use the option mid + final-term exam, need to get at least 40 points (out of 100) in the latter to compute the average grade, which will be the final grade (for the written exam) for them. In the hypothetical

			case that a student gets less than 40 points in the second exam (final-term exam), the grade will be FAIL and the numerical qualification will be the one got in that failed exam. [ESC: 50%, INF: 20%]
Laboratory sessions	30.00%	0.00%	Work on lab assignments and individual resolution of those problems proposed by the professors. These assignments & exercises will typically be started in the laboratory but they can probably require time for study, analysis and completion out of the in-class timetable. On-site EXAMS will be made for their assessment [LAB]
Assessment of active participation	10.00%	0.00%	This final part will assess attendance and merit-based on-site participation. If quizzes are utilised, their grading will enter in this section. Notice that the final grade, using this, could sum up further than 100% so that the extra work & effort could be correctly valued. On-site participation [PRES]
Total:		110.00%	0.00%

Evaluation criteria for the final exam:

The final grade for the course will be computed as: written tests + lab tests (related to lab assignments) + laboratory participation + in-class participation. To pass the course there is an important requirement: the student must achieve at least 50% of the points given by the written exams. Laboratory tests will award, at maximum, 30 of the total 100 points (out of 100), but these exams are not compulsory. They CAN NOT be repeated however. Written exams account for 70 points from the total 100. This part can be gotten either by a single final exam (in the official date of the regular session) or by two partial exams (mid-term and final-term, the latter takes place at the official date of the regular session). In order to use this second option, the student must pass the mid-term exam (at least 50 out of 100 points), and only then, s/he'll have the option to sit the final-term exam. To compute the average between mid and final term, in the second exam the grade must be at least 40 out of 100. If this condition holds, the final grade for these written exams would be the computed by averaging both grades, otherwise the final grade will be the one obtained in the final-term exam (FAIL). If a student has a grade below 50% in the written exams (in any of the two possibilities), the final grade (also FAIL) will be calculated as the maximum between 40 (out of 100) and written-exams-grade (out of 100).

Specifications for the resit/retake exam:

For the supplementary/extra exam session, students will have to retake all the achievement tests, with the same weight as in the final grade (70%). Besides, the score, if existing in the regular session, from the assignments to be submitted, will also be added.

(In-class participation is not accounted in this case.)

Specifications for the second resit / retake exam:

There will be a final test, with 100% weight in the final grade.

9. Assignments, course calendar and important dates	
Not related to the syllabus/contents	
Hours	hours
Final test [PRESENCIAL][Assessment tests]	6
General comments about the planning: This course schedule is APPROXIMATE. It could vary throughout the academic course due to teaching needs, bank holidays, etc. A weekly schedule will be properly detailed and updated on the online platform (Virtual Campus). Note that all the lectures, practice sessions, exams and related activities performed in the bilingual groups will be entirely taught and assessed in English. Classes will be scheduled in 3 sessions of one hour and a half per week. The assessment activities could be performed in the afternoon, in case of necessity.	
Unit 1 (de 4): Introduction: Fundamental concepts of Object-Oriented Programming (OOP)	
Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	1
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	1
Computer room practice [PRESENCIAL][Practical or hands-on activities]	2
Practicum and practical activities report writing or preparation [AUTÓNOMA][Project/Problem Based Learning (PBL)]	2
Study and Exam Preparation [AUTÓNOMA][Self-study]	4
Teaching period: Weeks 1 and 2	
Unit 2 (de 4): Object-Oriented Programming	
Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	8
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	8
Computer room practice [PRESENCIAL][Practical or hands-on activities]	16
Final test [PRESENCIAL][Assessment tests]	4
Practicum and practical activities report writing or preparation [AUTÓNOMA][Project/Problem Based Learning (PBL)]	10
Study and Exam Preparation [AUTÓNOMA][Self-study]	38
Teaching period: Weeks 3-9, 11 and 13	
Unit 3 (de 4): Exception handling	
Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	2
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	2
Computer room practice [PRESENCIAL][Practical or hands-on activities]	4
Final test [PRESENCIAL][Assessment tests]	4
Practicum and practical activities report writing or preparation [AUTÓNOMA][Project/Problem Based Learning (PBL)]	7
Study and Exam Preparation [AUTÓNOMA][Self-study]	5
Teaching period: Week 10	
Unit 4 (de 4): Introduction to event-driven programming	
Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	2
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	2
Computer room practice [PRESENCIAL][Practical or hands-on activities]	4

Final test [PRESENCIAL][Assessment tests]	2
Practicum and practical activities report writing or preparation [AUTÓNOMA][Project/Problem Based Learning (PBL)]	2
Study and Exam Preparation [AUTÓNOMA][Self-study]	14
Teaching period: Weeks 12-13	
Global activity	
Activities	hours
Class Attendance (theory) [PRESENCIAL][Lectures]	13
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	13
Computer room practice [PRESENCIAL][Practical or hands-on activities]	26
Final test [PRESENCIAL][Assessment tests]	8
Practicum and practical activities report writing or preparation [AUTÓNOMA][Project/Problem Based Learning (PBL)]	21
Study and Exam Preparation [AUTÓNOMA][Self-study]	61
Final test [PRESENCIAL][Assessment tests]	8
Total horas: 150	

10. Bibliography and Sources						
Author(s)	Title/Link	Publishing house	Citv	ISBN	Year	Description
Nacho Cabanes	Introducción a Java http://www.nachocabanes.com/java/				2015	Material de apoyo, libre y disponible online
Oracle	Oracle Tutorials on Java https://docs.oracle.com/javase/tutorial/	Online resources			2017	Ayuda y documentación (en inglés): https://docs.oracle.com/javase/tutorial/
Paul Deitel (Author), Deitel (Author)	Java How To Program (Early Objects) (10th Edition)	Pearson - Prentice Hall		978-0133807806	2014	
Sánchez Allende, Jesús	Programación en Java	McGraw-Hill		978-84-481-6107-1	2009	
Y. Daniel Liang	Introduction to Java Programming, Comprehensive Version (10th Edition)	Pearson - Prentice Hall		978-0133813463	2014	
Eckel, Bruce	Thinking in Java	Prentice Hall		0131872486	2006	
Jorge Martínez Ladrón de Guevara	Fundamentos de programación en Java	EME		978-84-96285-36-2	2012	Libro de la Universidad Complutense de Madrid que describe muchos de los conceptos estudiados en esta asignatura