



COURSE: Algorithms and Data Structures II

ACADEMIC YEAR: 2018-2019

TYPE OF EDUCATIONAL ACTIVITY: Characterizing

TEACHER: Giansalvatore Mecca, Donatello Santoro

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Language: Italian

ECTS: 6	n. of hours: 52	Campus: Potenza Dept.: DiMIE Program: Scienze e Tecnologie Informatiche	Semester: First
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EDUCATIONAL GOALS AND EXPECTED LEARNING OUTCOMES

The main goal of this course is teaching core notions of the object oriented programming. In particular, there will be three different levels to conclude the exam:

Basic Level

The minimum knowledge level to be acquired in order to pass the final exam regards both theory and practice concepts related the object oriented programming. In particular the knowledge of the following topics is required:

- the core techniques of the object oriented programming (components, class, objects, properties, methods, constructor, references)
- application layers
- exception handling
- syntax and semantics of the java language
- logging framework
- java standard packages (java.lang, java.io, java.util)
- syntax and semantics of the UML language

Intermediate level

Achieving the intermediate level means having a good knowledge of the course topics. In particular, in addition to skills and ability required for the basic level, students must have the following knowledge:

- conceptual models
- software development methodology
- syntax and semantics of the C# language
- core C# namespace (System, System.Collections, System.IO)

Advanced level

Achieving the advanced level means that students have all the competences and the skills, in theory and in practice, of the course topics. . In particular, in addition to skills and ability required for the intermediate level, students must have the following knowledge:

- regression tests and JUnit, NUnit frameworks
- syntax and semantics of Objective C
- reflection

PRE-REQUIREMENTS

The course requires the knowledge of a procedural programming language

SYLLABUS

Introduction

Introduction. Reference Platforms. The Java Platform

Class and Objects

Components. Methods and Properties. Classes. Objects. Constructors. References.

Syntax and Semantics



Syntax and semantics of Java. Style guidelines.

UML

Class diagram. Use case diagram. Collaboration diagram. Sequence diagram.

Responsibilities and application layers

Encapsulation. Interfaces and implementation. Responsibilities. Application layers. Standard architecture. Development process.

Exceptions

Exception handling. Checked exception. Defensive programming.

Test and Correction

Test. Regression testing. Test frameworks. Debugging. Logging systems.

C#

The .NET platform. Syntax and semantics of C#.

Objective C

Syntax and semantics of Objective C. Memory management. .

XML

XML. Trees and documents. Paths and Queries. DTD Schema. XML Schema.

TEACHING METHODS

The course will offer 76 teaching hours. In particular, there will be 40h theoretical lessons and 12 hour of laboratory tutorials.

EVALUATION METHODS

Students must take both a multiple choice test and a practical test on the computer; the latter test is provided according to the three learning levels described before (basic, intermediate, advanced).

In addition, students could take the inter-course tests (multiple choice tests) to be done at the end of each semester. Passing such inter-course tests will allow students to directly access to the practical test on the computer (within the September session), also having 2 extra bonus points

TEXTBOOKS AND ON-LINE EDUCATIONAL MATERIAL

Lecture notes available on the web site of the course

Textbooks

- Cay S. Horstmann. Big Java (5th edition)
 - Martin Fowler, Kendall Scott -- UML Distilled
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INTERACTION WITH STUDENTS

Consulting hours

Prof. Giansalvatore Mecca: 12:30 – 13:30 <https://goo.gl/P32yUo>

Dott. Donatello Santoro: 12:30 – 13:30 <https://book.donatellosantoro.com/>

EXAMINATION SESSIONS (FORECAST)¹

- I intermediate test – 16 December 2019
 - II intermediate test – 3-4 February 2020
 - I Session - 13-14 February 2020
 - II Session - 27-28 February 2020
 - III Session - 29-30 April 2020
 - IV Session - 6-7 July 2020
 - V Session - 10-11 September 2020
 - VI Session - 17-18 December 2020
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SEMINARS BY EXTERNAL EXPERTS YES NO

¹ Subject to possible changes: check the web site of the Teacher or the Department/School for updates.