COURSE PRESENTATION FORM – ACADEMIC YEAR XXXX / XXXX

COURSE NAME	Advanced Programming
COURSE CODE	<leave blank>
LECTURER	Barbara Russo
TEACHING ASSISTANT	
TEACHING LANGUAGE	English
CREDIT POINTS	<leave blank>
LECTURE HOURS	<leave blank>
EXERCISE HOURS	<leave blank>
OFFICE HOURS LECTURER	During the lecture time span, <WEEKDAY>, <TIME> Faculty of CS, POS Building, piazza Domenicani 3, office <X.XX> <day, time and office where you will be available for students during the lecture time span; the office for contract professors is no. 2.10>
OFFICE HOURS TEACHING ASSISTANT	<fill in if possible, else leave blank>
PREREQUISITES	Students are familiar with basic knowledge of object oriented programming with Java. This material is taught in the following undergraduate courses: • Introduction to Programming
OBJECTIVES	This course will provide the students with methods to develop software with quality. In particular, students will acquire knowledge in methods and practices to develop software in team (e.g. SCRUM or Test Driven Development), use of advanced programming techniques (e.g. Run Time Type Identification and Pseudo Polymorphism) and use of appropriate languages to write requirements (User stories), design (CRC cards and UML class diagrams, and code documentation (Java doc) of the software developed.
SYLLABUS	• Organizing Software Development with Object Oriented Paradigm • Requirements and requirements elicitation with eXtreme Programming • Design and design modeling with CRC cards and UML class diagrams • Testing, Unit Testing, and Test Driven Development • Exception handling • Code execution and Memory models • Virtual function and late binding • Advances in inheritance: subtyping and sub-classing the Liskov principle

- Multiple inheritance with delegation
- Pseudo polymorphism in Java
- Run Time Type identification and Reflection API
- Generics, type inference and erasure
- Introduction to design patterns in Java

TEACHING FORMAT   Frontal lectures and lab exercises

ASSESSMENT   The assessment is based on the assignments (50%) and the oral exam (50%) to be done during the semester or all in one at the exam.

To access to the oral exam, students must have passed (18 or more) the assignments assessment.
In case the assignment assessment is positive but the final oral exam is not positive the assignments grade is valid for all three regular exam sessions.

There is a midterm. The midterm counts for 50% of the final oral exam.
In case the midterm grade is positive (18 or greater), the grade is valid for all three regular exam sessions.

READING LIST   Lecture notes and papers will be handed out during the course.
Book reference for project management and development:
R. S. Pressman Software Engineering – A Practitioner's approach,
sixth   edition, McGraw-Hill. **University Shelf: 15 ST 230 P935(6)**

On-line reference for the development in Java and project management:
- http://www.oracle.com/technetwork/java/index.html
- https://pro.unibz.it/staff/brusso/SEReadings.htm

SOFTWARE USED
- Eclipse, IDE platform to develop and manage the Java project
- SVN, control versioning system
- JUnit, unit tests
- TRAC, to manage and share requirements and design

LEARNING OUTCOME
- Understanding and applying languages and techniques to analyze requirements, and design and code software.
- Understanding and applying advanced techniques of Java programming
- Understanding code compilation and execution by modeling memory allocation in Java
- Applying methods to develop software in team while controlling its quality

COURSE PAGE   www.teleacademy.it
http://pro.unibz.it/staff/brusso/AdvancedProgramming/index.html