301AA - Advanced Programming [AP-2019]

Lecturer: Andrea Corradini  
andrea@di.unipi.it  
http://pages.di.unipi.it/corradini/

Assistant: Matteo Busi  
matteo.busi@di.unipi.it

Course pages:  
http://pages.di.unipi.it/corradini/Didattica/AP-19/

Department of Computer Science, Pisa  
Academic Year 2019/20

AP-01: Overview and Admins
Goals

• To provide the students with a deep understanding of how high level programming concepts and metaphors map into executable systems and which are their costs and limitations
• To gain familiarity with modern principles, techniques, and best practices of software construction
• To introduce the students to techniques of programming at higher abstraction levels, in particular component programming and functional programming
• To present state-of-the-art frameworks incorporating these techniques.
Prerequisites

• Undergraduate level knowledge of
  – at least one object-oriented programming language (like Java, C++, C# or others)
  – at least one functional programming language (like Haskell, OCaml, Scheme or others)

➔ Informal test soon: Thursday

➔ Suggestions to fill possible gaps will be given
Programme

- Run Time Support and Execution Environments
- Component Based Programming
- Software and Application Frameworks
- Polymorphism & Generic Programming
- Functional aspects of programming languages
- Scripting languages
- Advanced concepts in programming languages
Organization of the course

- An **informal entry test** will be proposed at the beginning of the course. If the solutions are not satisfactory the student will be instructed on how to fill the identified gaps in the preparation.
- **Frontal lessons** are performed using slides and blackboard
- **Practical sessions** will take place in the classroom, under supervision of the lecturer and of the tutor. Students are invited to bring their own laptops
- Interaction with the teacher is done through interviews (on fixed office hours or by appointment) and by e-mail.
- On the **web page of the course**, the slides presented in each lesson are published progressively, with references to corresponding topics in the reading material.
Evaluation and other things...

Evaluation
• Some (three?) programming assignments during the course
• Final oral exam

Attendance to the course is strongly encouraged
• If you miss a lesson, you can find on the course web page the list of topics presented for each lesson, with the projected slides and references to the relevant teaching material.
• Examination methods for non-attending students are identical to those for attending students.
Reading material

• Will be suggested progressively along the course
• Mostly material accessible on-line

Credits

• Slides of the course freely taken and elaborated from a number of sources:
  – Giuseppe Attardi (DIP), Advanced Programming
  – Gianluigi Ferrari (DIP), Advanced Programming
  – Antonio Cisternino (DIP)
  – and others that will be indicated along the course
Some Suggested Readings


Admins...

- Web page of the course:  
  *(permanently under construction...)*

- Office Hours: **Friday, 9-11**
  - Also: by appointment, sending an email to  
    [andrea@di.unipi.it](mailto:andrea@di.unipi.it)
Other infos

• Italian language courses, organized by CLI (Centro Linguistico Interdipartimentale)
  – [http://www.cli.unipi.it/corsi/test-dingresso](http://www.cli.unipi.it/corsi/test-dingresso)

• List of courses offered by the Master Programmes, Timetables, ...

• Erasmus+ -- next call: **25/09/2019** deadline: **9/10/2019**

• Double Degree with "Master Degree in Computer Engineering" of University of Malaga

• → for info send an email to [erasmus@di.unipi.it](mailto:erasmus@di.unipi.it)