301AA - Advanced Programming
[AP-2017]

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Department of Computer Science, Pisa
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AP-2017-01: Overview and Admins
Goals

• To provide 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 programming techniques at higher abstraction levels, including component programming and generative 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: next Thursday
⇒ Suggestions to fill possible gaps will be given
⇒ Second test later
Programme

• Run Time Support and Execution Environments
• Advanced Constructs in Programming Languages
• Generic Programming
• Component Based Programming
• Class Libraries and Frameworks
• Language Interoperability
• Generative Programming
Organization of the course

- **An entry test** will be proposed at the beginning of the course. Students who will not pass the test will be instructed on how to fill the identified gaps.
- **Frontal lessons** are performed using slides and blackboard.
- **Practical sessions** will take place in the classroom, under supervision of the lecturer and of the assistant. 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**
- Two or three programming assignments during the course
- Final oral exam

**Attendance to the course is strongly encouraged**
- If you miss a few lectures, 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 online material

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: to be fixed
  – Also: by appointment sending an email to
    [andrea@di.unipi.it](mailto:andrea@di.unipi.it)

• Instructions concerning “Curricula” for students of the **second year** of the Master in Computer Science