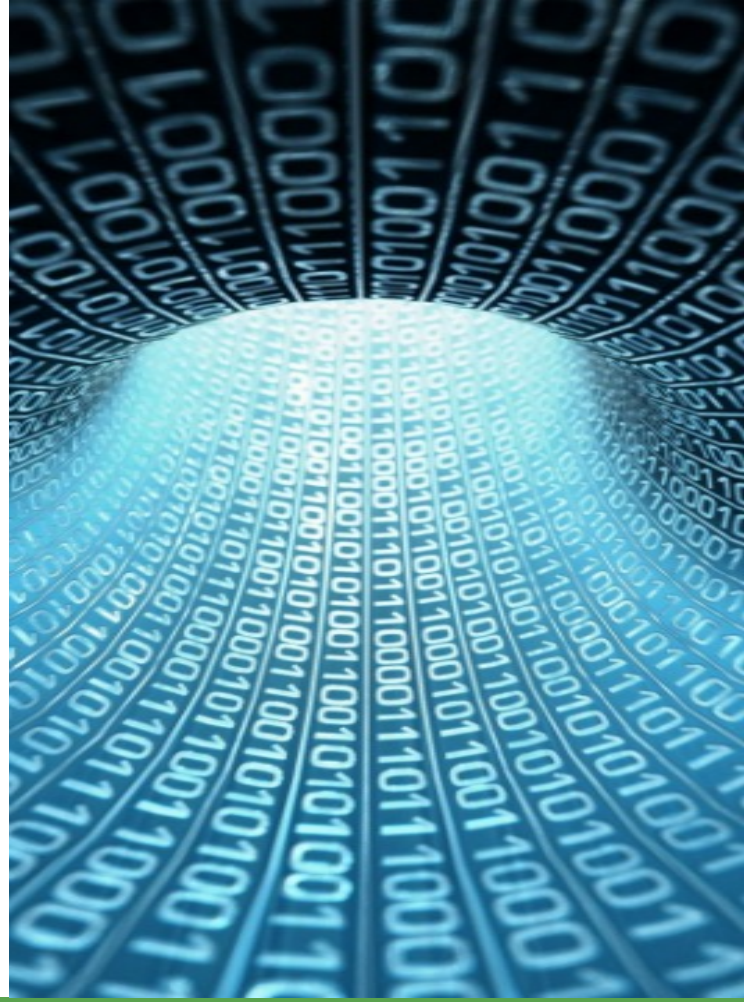
POLITECNICO
DI TORINO
Dipartimento
di Automatica e Informatica

Programming Techniques

02OJPLM

A.A. 2021/2022

INTRODUCTION TO THE COURSE



Teachers

Lectures:

- Prof. **Santa Di Cataldo,** e-mail: santa.dicataldo@polito.it
- Prof. **Paolo Camurati,** e-mail: paolo.camurati@polito.it

Laboratories:

- Eng. **Edoardo Giusto**, e-mail: edoardo.giusto@polito.it

Content of the course

- Second step, for students in Computer Engineering, in the process of getting introduced to computer programming as a tool for solving real problems
- Consolidation of problem solving skills, introduction to data structures and algorithms
- Introduction to a new programming language: C
- Approach is very different from the Python course: **learning by experience and imitation**, much lesser time dedicated to going through syntactic details (you can partially do it on your own with the help of a handbook or existing materials…)

Detailed description:

https://didattica.polito.it/pls/portal30/gap.pkg_guide.viewGap?p_cod_ins=02OJPLM&p_a_acc=2021&p_header=S&p_lang=

Content of the course

- Basic notions of architecture and logic (10 h)
- C as a second programming language (20 h)
- Pointers and dynamic allocation in C (10 h)
- Elementary problem-solving (20 h)

Detailed description:

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Available materials

- Slides of the course and additional materials will be made available in the Portale della Didattica
- Suggested handbook (reference for C language): Deitel & Deitel, "C: how to program", Pearson Prentice Hall, 2010
- **We will not videostream**… **Video-recordings of last year**'s lectures and labs are already available

Extra materials:

- Any additional slides, books, videos, tutorials you may find in the internet that is useful for you to go more in depth into the topics of the course
- (unfortunately only in italian…) G. Cabodi, P. Camurati, P. Pasini, D. Patti, D. Vendraminetto, "Dal problema al programma: introduzione al problem-solving in linguaggio C", Apogeo, II edizione, 2016

Practical organization

	Monday	Tuesday
13:00-14:30		LECTURE (*)
14:30-16:00	LECTURE	
16:00-17:30	LECTURE	

	Thursday
8:30-10:00	LAB (TEAM 1)
10:00-11:30	LAB (TEAM 2)

4.5 hours per week, 14 weeks in total. 10 labs (more or less…). **Completely in presence**. There will also be **recordings of last year's classes available**, for your reference, but the official material is always the one of this year.

Labs start from 2nd week of the course: Thursday, **10/03/2021**

- **Team 1**: from A*** to K***
- **Team 2**: from L*** to Z***

(*) **Only when there is no lab or we need extras**, we have an extra lecture on Tuesday
This week there is no lab → we have class tomorrow, Tuesday 1/03/2021

Always check Portale della Didattica/Slack for latest updates!!

Off-line messaging

- The official channel for all communication is PORTALE DELLA DIDATTICA and e-mail **Smatricola@studenti.polito.it**
- As additional instrument for **offline communication**, as well as a **support to laboratory activity**, we created a **Slack workspace for this course**
- You **NEED** to subscribe using Polito e-mail **Smatricola@studenti.polito.it**
  - You should have received the invitation by email, already
  - No nicknames please: you need to be clearly identifiable
  - Follow conduct rules carefully

Programming tools

- You can use the IDE for C programming that you prefer
- We suggest CLion:
  - A JetBrains product (so, it is quite similar to PyCharm)
  - Cross-platform (Windows, MAC, Linux)
  - Educational licensing available for students (same as PyCharm)
  - We assume that, after Python course, you are able to install and configure an IDE on you own, by following instructions you can find online: https://www.jetbrains.com/clion/
  - Anyway, we provided **a tutorial in the Portale della Didattica**
- Please, **have the IDE ready by the beginning of labs**!

Exam: preliminary rules!!!

- Written exam, 90 min. Consists of:
  - Open/multiple choice questions
  - Programming exercises/problem solving exercises in C
  - More details/logistics/examples will be clarified later on, during the course
- At the end the student can take a snapshot with his/her work. He/she must upload onto Portal within three days:
  - a report (max 1 page) on the adopted solution (data structures, algorithm, etc.)
  - a copy of the correct program, highlighting changes with respect to the original one.
  - If the material is not submitted by the deadline, the exam will not be evalutated
- In the coming weeks, we will upload a document with detailed rules

Laboratories

- Optionally, laboratory assignments can be submitted for evaluation during the course
  - You can obtain upto 2 points extra-bonus for the exam
  - Bonus will remain valid for one year long: 28 february 2023
- Deadlines for submission will be made available later on, during the course
  - There won’t be week-by-week deadlines: there may be 3 deadlines during the course, corresponding to 3 groups of lab assignments
- It is an extra: not mandatory…
  - We anyway suggest you to DO the assignments, even at a later time… it helps you getting ready for the exam.

Some suggestions

- To KNOW is not sufficient (attending + understanding + studying)
- You need to KNOW how TO DO (practicing + applying)
- A program does not have to «WORK», it has to «WORK WELL»
  - Efficiency
  - Readability
  - Mainteinability
  - Reliability
  - …

Programming course

Past:

- Computer Science - C Language: (I year - 8 CFU)
- Algorithms and Programing - advanced problem solving)
  (II year – 12 CFU)

Present/Future:

- Computer Science - Python Language: (I year - 8 CFU)
- Programming techniques – basic problem solving in C (I year – 6 CFU)
- Algorithms and Programing - advanced problem solving in C
  (II year – 8 CFU)

Past experience

Very traumatizing passage from I (common) to II year

- Algorithms and Programming is DIFFICULT
- 60% of new students passed in the first 4 trials, the rest simply did not

- Different types of attitude:
  - "I quit half-way: too difficult for me" (WRONG ATTITUDE)
  - "I take the challenge, attend classes and labs, study, do a lot of practice and pass the exam" (RIGHT ATTITUDE)
- New "Programming techniques" course:
  - Introduced to create more balance between the topics of 1st and 2nd year
  - We anticipate the "trauma" a little bit…

What do you need for the course?

- Pre-requirements:
  - Programming skills (Python): C is a SECOND language
  - Logic and problem solving skills: trasform a problem into a strategy of solution
  - Practical skills: transform a strategy (algorithm) into a functioning program
- Continuous efforts during the semester:
  - Attend lectures and deepen the concepts when you study
  - Do practice, do labs in time
  - Do not give up half-way… «waking-up» 2 weeks before the exam does not help much…