

Cloud Computing

Computer Engineering (CE)

Artificial Intelligence and Data Engineering (AIDE)

A.A. 2024/2025

Who am I?

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What do I do?

Research Interests:

- Internet of Things (you might find me again....)
- Edge/Fog Computing
- Wireless Communication Technologies

Roles:

- Coordinator of the Crosslab in 'Cloud Computing, Big Data and Cybersecurity'

What's this?

Cloud Computing

Mandatory class for AIDE

Optional class for CE

Duration 90 Hours (9 CFU)

Two different Modules (60+30 Hours):

- Module I: Cloud Infrastructure and Technologies
- Module II: Cloud Programming Models

Instructors:

- **Carlo Vallati (Module I - 60 Hours - 6 CFU)**
- Carlo Puliafito (Module II - 30 Hours - 3 CFU)

What do we do?

Course Layout:

1. Module I

1. General Intro and Foundations Concepts (8 Hours)
2. Virtualization Technologies (12 Hours)
3. Cloud Applications (12 Hours)
4. Cloud Platforms (18 Hours)
5. Cloud Infrastructure and Mechanisms (10 Hours)

2. Module II

1. Cloud Programming Models (30 Hours)

How do we do that?

- *Mix of theoretical classes (the majority, I'm sorry) plus hands-on laboratories*

Final exam:

- Project
- Oral Examination

Bibliography:

- [cam-san] "Cloud Computing" by Sandeep Bhowmik. Cambridge University Press; 1 edition (July 4, 2017). ISBN-13: 978-1316638101
- Material provided by instructor (slides, papers, etc)

Final Goals

- Get overall knowledge on *Cloud Computing Technologies and Applications*
- Get a general insight on how a *Cloud Computing infrastructure* is designed and managed
- General introduction to *Cloud Programming Models for Big Data Analysis*
- *Get your hands dirty with some practical labs*
- In summary, get an answer (at least from a high level) to those questions:
 - How does Google handle 63000 searches per second?
 - How does Google manage an infrastructure of approximately 1 million servers?
 - How does Facebook support 2,41 BILLION monthly active users?

Seminars

Two seminars delivering direct experience from industry at the end of semester (to be confirmed):

- Aruba – design and operate a datacenter
- Google – Introduction to Site Reliability Engineering at Google
- Visit at the datacenter of the University of Pisa

Pointers

- Course website:

<http://www.iet.unipi.it/c.vallati/cloud>

- Meeting hours:

Tuesday 10.30 – 12.30 (send an email in advance for confirmation!)

Schedule

- Mon, 10.30-12.30 ADII1
- Tue, 16.30-19.30, A13 (lezione aperitivo)
- Fri, 8.30-11.30, F1
- Lab hours will be announced in advanced. **Bring your laptop charged!**

Material

- Material will be made available on the MS Team channel of the course
- [876II 24/25 - CLOUD COMPUTING \[WAI-LM\] | General | Microsoft Teams](#)

Register

- Register to the class to get a VM created for remote labs

<https://forms.office.com/e/kt1KYZKZHu?origin=IprLink>

- Erasmus: please report your background and if you're a bachelor or master student in the form



Class Recordings

- Classes and lab will be recorded (if everything works), so if you miss a lecture don't worry
- Come to class especially for the labs where you could interact with the instructor

Are you ready?