# Syllabus

## Course description

<table>
<thead>
<tr>
<th>Course title</th>
<th>Cloud Computing</th>
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<tbody>
<tr>
<td>Course code</td>
<td>46055</td>
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<tr>
<td>Scientific sector</td>
<td>INF/01</td>
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<tr>
<td>Degree</td>
<td>Advanced-Systems Engineering</td>
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<tr>
<td>Semester</td>
<td>2</td>
</tr>
<tr>
<td>Year</td>
<td>1</td>
</tr>
<tr>
<td>Academic year</td>
<td>2021-2022</td>
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<tr>
<td>Credits</td>
<td>3</td>
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<tr>
<td>Modular</td>
<td>No</td>
</tr>
<tr>
<td>Total lecturing hours</td>
<td>32</td>
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<tr>
<td>Attendance</td>
<td>Attendance is not compulsory, but non-attending students are suggested to contact the lecturer at the start of the course to agree on the modalities of the independent study.</td>
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<tr>
<td>Prerequisites</td>
<td>Basic IT knowledge, familiarity with general networking concepts, Working knowledge of distributed systems</td>
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<tr>
<td>Course page</td>
<td><a href="https://ole.unibz.it/">https://ole.unibz.it/</a></td>
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## Specific educational objectives

The Cloud Computing course focuses understanding, designing and implementing distributed and cloud systems to solve real life problems. The main educational objectives of the course are:

- Understand the core concepts of distributed systems and cloud computing
- Cloud infrastructure from the ground up
- Analyze trade-offs between cloud deployment models and providers
- Distributed systems and Blockchain
- Performance, scalability, and availability measurements in the cloud
- Security and privacy in cloud computing
- Edge computing technologies
- Address real-world problems using cloud computing

## Learning outcomes

**Knowledge and understanding:**

D1.3 To know in depth the scientific method of investigation applied to complex systems and innovative technologies that support information technology and its applications;

D1.5 To know the fundamentals, techniques and methods of design, customization and implementation of software to support the automation of new generation information systems for industrial production and business;

**Applying knowledge and understanding:**

D2.4 To be able to define an innovative technical solution to an application problem that meets technical, functional and organisational constraints and requirements;
| Making judgments:                                        | D3.1 To be able to autonomously select documentation from a variety of sources, including technical books, digital libraries, technical scientific journals, web portals or open source software and hardware tools;  
|                                                      | D3.4 To be able to reconcile the objectives of the project that are in conflict, to trade-off cost, resources, time, knowledge or risk;  
| Communication skills:                                  | D4.3 To be able to structure and draft scientific and technical documentation describing project activities;  
|                                                      | D4.5 To be able to prepare and conduct technical presentations in English;  
|                                                      | D4.6 To be able to interact and collaborate during the implementation of a project or research with peers and experts;  
| Learning skills:                                       | D5.1 To be able to independently extend the knowledge acquired during the course of study by reading and understanding scientific and technical documentation in English;  
|                                                      | D5.3 In the context of a problem solving activity, to be able to extend knowledge, even if incomplete, taking into account the final objective of the project;  
| Assessment                                             | The assessment of the course consists of a project presentation and evaluation  
| Assessment language                                    | English  
| Evaluation criteria and criteria for awarding marks    | The students are required to implement a distributed system or cloud based solution for specific problems (e.g., auto-scaling, security, performance, consensus). The project will focus on one or more topics covered during the lectures and labs. The output of the project are:  
|                                                      | • a written report describing (problem statement, proposed solution, system design and architecture, functionality, development problems/solutions)  
|                                                      | • a working demo of the application  
|                                                      | • a project presentation  
|                                                      | The goal of the project is to assess to which degree students have achieved the following learning outcomes: applying knowledge and understanding, making judgments, communication skills and ability to learn.  
| Required readings                                      |  
| Supplementary readings                                 | Online resources:  
|                                                      | • [https://aws.amazon.com/getting-started/](https://aws.amazon.com/getting-started/)  
|                                                      | • [https://docs.microsoft.com/en-us/azure/](https://docs.microsoft.com/en-us/azure/)  
|                                                      | • [https://ethereum.org/developers/](https://ethereum.org/developers/)  