Prior skills

Python is the programming language of choice for the labs sessions of this course. It is assumed that the student has a basic knowledge of Python prior to starting classes. Also, prior exposure to Git and experience with Linux basics will be necessary.

Warning. Be sure to acquire the required background prior to starting CC-MEI labs.

Degree competences to which the subject contributes

**Basic:**
- CB6. Ability to apply the acquired knowledge and capacity for solving problems in new or unknown environments within broader (or multidisciplinary) contexts related to their area of study.
- CB8. Capability to communicate their conclusions, and the knowledge and rationale underpinning these, to both skilled and unskilled public in a clear and unambiguous way.
- CB9. Possession of the learning skills that enable the students to continue studying in a way that will be mainly self-directed or autonomous.

**Specific:**
- CTE6. Capability to design and evaluate operating systems and servers, and applications and systems based on distributed computing.
- CTE9. Capability to apply mathematical, statistical and artificial intelligence methods to model, design and develop applications, services, intelligent systems and knowledge-based systems.

**Generic:**
- CG1. Capability to plan, calculate and design products, processes and facilities in all areas of Computer Science.
- CG4. Capacity for mathematical modeling, calculation and simulation in technology and engineering companies centers, particularly in research, development and innovation tasks in all areas related to Informatics Engineering.
- CG7. Capacity for implementation, direction and management of computer manufacturing processes, with guarantee of safety for people and assets, the final quality of the products and their homologation.
- CG8. Capability to apply the acquired knowledge and to solve problems in new or unfamiliar environments inside broad and multidisciplinary contexts, being able to integrate this knowledge.
- CG6. Capacity for general management, technical management and research projects management, development and innovation in companies and technology centers in the area of Computer Science.

**Transversal:**
- CTR5. APPROPRIATE ATTITUDE TOWARDS WORK: Capability to be motivated by professional achievement and to face new challenges, to have a broad vision of the possibilities of a career in the field of informatics engineering. Capability to be motivated by quality and continuous improvement, and to act strictly on professional development. Capability to adapt to technological or organizational changes. Capacity for working in absence of information and/or with time and/or resources constraints.
Teaching methodology

During the course there will be four types of activities:

a) Activities focused on the acquisition of theoretical knowledge. Regular and consistent attendance is expected and to be able to discuss concepts covered during class. The theoretical activities include participatory lecture classes, which explain the basic contents of the course.

b) Activities focused on the acquisition of knowledge through experimentation by "learn by doing" approach in lab sessions. Hands-on sessions will be conducted during lab sessions. Each hands-on will involve writing a lab report with all the results to be delivered one week later.

c) Homework will be assigned weekly that includes reading documentation that expands the concepts introduced during lectures, and periodically will include reading research papers related with the lecture of the week, and prepare short presentations (with slides that will be submitted to the Racó). Some students/groups randomly chosen will present their short presentation.

d) Course project that will be based on technologies considered in this course.

Learning objectives of the subject

1. Cloud Basics
2. Understand current required layers in a Big Data Software Stack
3. Understand APIs: The doors in the Cloud
4. Learn new Software requirements for Advanced Analytics
5. Learn new Hardware requirements for Advanced Analytics
6. Learn by doing in Lab sessions

Study load

<table>
<thead>
<tr>
<th>Total learning time: 75h</th>
<th>Theory classes: 12h</th>
<th>16.00%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Practical classes: 0h</td>
<td>0.00%</td>
</tr>
<tr>
<td></td>
<td>Laboratory classes: 12h</td>
<td>16.00%</td>
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<tr>
<td></td>
<td>Guided activities: 3h</td>
<td>4.00%</td>
</tr>
<tr>
<td></td>
<td>Self study: 48h</td>
<td>64.00%</td>
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</table>
# Content

<table>
<thead>
<tr>
<th>Section</th>
<th>Degree competences to which the content contributes:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cloud Computing paradigm &amp; technologies</strong></td>
<td></td>
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<tr>
<td><strong>Current layers in a Cloud Computing Software Stack</strong></td>
<td></td>
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<tr>
<td><strong>Cloud Computers Hardware: the Paradigm shift</strong></td>
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<tr>
<td><strong>AI &amp; DL: The next wave of Cloud</strong></td>
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<tr>
<td><strong>Under the hood of AI &amp; DL: a case study</strong></td>
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<tr>
<td><strong>Lab session 1</strong></td>
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<tr>
<td><strong>Lab session 2</strong></td>
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<td><strong>Lab session 3</strong></td>
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<tr>
<td><strong>Lab session 4</strong></td>
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</tbody>
</table>
Lab session 5

Degree competences to which the content contributes:

Short presentations

Degree competences to which the content contributes:

Description:
Homework will be assigned weekly that includes reading documentation that expands the concepts introduced during lectures, and periodically will include reading research papers related with the lecture of the week, and prepare short presentations (with slides that will be submitted to the Racó). Some students/groups randomly chosen will present their short presentation.
## Planning of activities

<table>
<thead>
<tr>
<th>Activity</th>
<th>Hours</th>
<th>Theory classes</th>
<th>Practical classes</th>
<th>Laboratory classes</th>
<th>Guided activities</th>
<th>Self study</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cloud Basics</strong></td>
<td>4h</td>
<td>2h</td>
<td>0h</td>
<td>2h</td>
<td>0h</td>
<td>0h</td>
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<tr>
<td><strong>Specific objectives:</strong></td>
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<tr>
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<tr>
<td><strong>Understand APIs: The doors in the Cloud</strong></td>
<td>2h</td>
<td>2h</td>
<td>0h</td>
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<tr>
<td><strong>Specific objectives:</strong></td>
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<td>3</td>
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<tr>
<td><strong>Understand current required layers in a Big Data Software Stack</strong></td>
<td>4h</td>
<td>4h</td>
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<tr>
<td><strong>Specific objectives:</strong></td>
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</tr>
<tr>
<td><strong>Learn new Software requirements for Advanced Analytics</strong></td>
<td>2h</td>
<td>2h</td>
<td>0h</td>
<td>0h</td>
<td>0h</td>
<td>0h</td>
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<td><strong>Specific objectives:</strong></td>
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<tr>
<td>4</td>
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</tbody>
</table>
### Learn new Hardware requirements for Advanced Analytics

**Specific objectives:**
1, 2, 3, 4, 5, 6

**Hours:** 1h 30m  
- Theory classes: 1h 30m  
- Practical classes: 0h  
- Laboratory classes: 0h  
- Guided activities: 0h  
- Self study: 0h

### Learn by doing in Lab sessions

**Specific objectives:**
1, 2, 3, 4, 5, 6

**Hours:** 11h 30m  
- Theory classes: 0h  
- Practical classes: 0h  
- Laboratory classes: 11h 30m  
- Guided activities: 0h  
- Self study: 0h

### Course project

**Specific objectives:**
1, 2, 3, 4, 5, 6

**Hours:** 27h  
- Theory classes: 0h  
- Practical classes: 0h  
- Laboratory classes: 0h  
- Guided activities: 2h  
- Self study: 25h

### Short presentations

**Specific objectives:**
1, 2, 3, 4, 5, 6

**Hours:** 6h  
- Theory classes: 2h  
- Practical classes: 0h  
- Laboratory classes: 0h  
- Guided activities: 0h  
- Self study: 4h

### Homework

**Specific objectives:**
1, 2, 3, 4, 5, 6

**Hours:** 17h  
- Theory classes: 0h  
- Practical classes: 0h  
- Laboratory classes: 0h  
- Guided activities: 0h  
- Self study: 17h
270531 - CC - Cloud Computing

**Qualification system**

The evaluation of this course will take into account different items:

- Attendance (minimum 85% required) & participation in class will account for 26% of the grade.
- Homework, reading papers and presentations will account for 33% of the grade.
- Hands-on (+reports) will account for 41% of the grade.

(the detailed score of each work/activity component of this course will be explained on the first day of class)

**Bibliography**

Basic:

TORRES, Jordi. Hand-on sessions at GitHub.
TORRES, Jordi. Slides of the course.

Others resources:

Hyperlink