Degrees to which the subject contributes

### Specific:

3. CETI2. Ability to select, design, develop, integrate, value, construct, manage, exploit and maintain technologies of machines, programming and nets, keeping suitable costs and quality parameters.

4. CETI4. Ability to select, design, deploy, integrate and manage network and communications infrastructure in an organization.

5. CETI6. Ability to design systems, applications and services based on network technologies, including internet, website, e-commerce, multimedia, interactive services and mobile computing.

6. CETI7. Ability to understand, implement and manage security and safety of computing systems.

### Transversal:

1. SELF-DIRECTED LEARNING - Level 3. Applying the knowledge gained in completing a task according to its relevance and importance. Deciding how to carry out a task, the amount of time to be devoted to it and the most suitable information sources.

2. THIRD LANGUAGE. Learning a third language, preferably English, to a degree of oral and written fluency that fits in with the future needs of the graduates of each course.

### Teaching methodology

Theoretical sessions will be handled at the assigned classroom using the multimedia equipment available. The professor will start sessions with the specific topic and will open the room for general discussion, introducing concepts, papers (previously reported) and other initiatives. Sessions must be dynamic, so requiring active participation form students. Papers discussions will be dynamically assigned and timely allocated. Papers discussions at the second half of the semester will be handled by the students individually and discussed through a clustering process within students before definitive public presentation.

### Learning objectives of the subject

Theoretical sessions will be handled at the assigned classroom using the multimedia equipment available. The professor will start sessions with the specific topic and will open the room for general discussion, introducing concepts, papers (previously reported) and other initiatives. Sessions must be dynamic, so requiring active participation form students. Papers discussions will be dynamically assigned and timely allocated. Papers discussions at the second half of the semester will be handled by the students individually and discussed through a clustering process within students before definitive public presentation.

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Analyze current network technologies, not only current ones, but also those yet in research phase. Acquiring solid knowledge in new Internet technologies, paying special attention in the new network paradigms expected for the coming future. The objective is to provide the student with a clear picture in the overall network concepts from real deployed technologies to unforeseen research innovations.

<table>
<thead>
<tr>
<th>Study load</th>
<th>Hours large group: 60h</th>
<th>Hours medium group: 0h</th>
<th>Hours small group: 0h</th>
<th>Guided activities: 0h</th>
<th>Self study: 90h</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total learning time: 150h</td>
<td>40.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>60.00%</td>
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</table>
### Content

<table>
<thead>
<tr>
<th>1. Current network model: Refreshing concepts</th>
<th>Learning time: 11h 36m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description:</td>
<td>Theory classes: 1h</td>
</tr>
<tr>
<td>1.1. Components and protocols</td>
<td>Practical classes: 2h</td>
</tr>
<tr>
<td>1.2. Switching technologies</td>
<td>Laboratory classes: 2h</td>
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<tr>
<td>1.3. Layering model</td>
<td>Self study: 6h 36m</td>
</tr>
<tr>
<td>1.4. Internet evolution</td>
<td></td>
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<tr>
<td>Related activities:</td>
<td></td>
</tr>
<tr>
<td>Activity 1: Class discussion</td>
<td></td>
</tr>
<tr>
<td>Specific objectives:</td>
<td></td>
</tr>
<tr>
<td>Align concepts about current Internet techn</td>
<td></td>
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<tr>
<td>ologies so the students gets the required</td>
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<tr>
<td>background to get introduced to innovative</td>
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<tr>
<td>network paradigms</td>
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<thead>
<tr>
<th>2. New network paradigms: Weaknesses</th>
<th>Learning time: 10h 36m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description:</td>
<td>Theory classes: 1h</td>
</tr>
<tr>
<td>2.1. Functionalities</td>
<td>Practical classes: 2h</td>
</tr>
<tr>
<td>2.2. New trends</td>
<td>Laboratory classes: 2h</td>
</tr>
<tr>
<td>Related activities:</td>
<td>Self study: 5h 36m</td>
</tr>
<tr>
<td>Activity 1: Paper discussion</td>
<td></td>
</tr>
<tr>
<td>Specific objectives:</td>
<td></td>
</tr>
<tr>
<td>Understanding main weaknesses introduced by</td>
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<tr>
<td>the new needs required by current and</td>
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<tr>
<td>emerging services and applications offered</td>
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<tr>
<td>to users. Knowledge on trends at the</td>
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<tr>
<td>research level to deal with these</td>
<td></td>
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<tr>
<td>weaknesses.</td>
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</tbody>
</table>
### 3. Research trends

**Learning time:** 21h 48m  
Theory classes: 2h  
Practical classes: 4h  
Laboratory classes: 2h  
Self study: 13h 48m

**Description:**  
3.1. Functions and properties  
3.2. Trends in routing, addressing, cloud, data,…  
3.3. Internet of things

**Related activities:**  
Activity 1: Paper discussion

**Specific objectives:**  
Identify most relevant activities and topics in the research area as well as the state of the art progress

### (ENG) 4. Routing & addressing

**Learning time:** 13h 36m  
Theory classes: 1h  
Practical classes: 2h  
Laboratory classes: 2h  
Guided activities: 3h  
Self study: 5h 36m

**Description:**  
4.1. Functions and properties  
4.2. Protocols  
4.3. The future

**Related activities:**  
Activity 1: Paper discussion
### (ENG) 5. Network management

**Description:**
- 5.1. QoS and QoE
- 5.2. Mobility
- 5.3. Addressing
- 5.4. Multimedia
- 5.5. Security
- 5.6. Efficiency

**Related activities:**
- Activity 1: Lab
- Activity 2: Papers discussion

**Learning time:** 30h 48m
- Theory classes: 3h
- Practical classes: 6h
- Laboratory classes: 5h
- Self study: 16h 48m

### (ENG) 6. Programmable networks

**Description:**
- 6.1. SDN
- 6.2. Data centers
- 6.3. Cloud networking

**Related activities:**
- Activity 1. Papers discussion

**Learning time:** 20h 12m
- Theory classes: 2h
- Practical classes: 4h
- Laboratory classes: 1h
- Self study: 13h 12m
### (ENG) 7. Literature overview

**Learning time:** 37h 24m
- Theory classes: 4h
- Practical classes: 8h
- Guided activities: 3h
- Self study: 22h 24m

<table>
<thead>
<tr>
<th>Description:</th>
</tr>
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<tbody>
<tr>
<td>7.1. Research lines</td>
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<tr>
<td>7.2. Evolutionary vs revolutionary design</td>
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<tr>
<td>7.3. Multilayer architecture</td>
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<tr>
<td>7.4. Green networking</td>
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<tr>
<td>7.5. The future</td>
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</tbody>
</table>

**Related activities:**
- Activity 1: Papers presentation

### Qualification system
Final Mark = 50% Presentation + 50% Discussion session

### Regulations for carrying out activities
All evaluation activities are mandatory

### Bibliography
**Basic:**