230700 - RES1 - Introduction to Research 1

Coordinating unit: 230 - ETSETB - Barcelona School of Telecommunications Engineering
Teaching unit: 230 - ETSETB - Barcelona School of Telecommunications Engineering
Academic year: 2019
Degree: MASTER'S DEGREE IN ADVANCED TELECOMMUNICATION TECHNOLOGIES (Syllabus 2019). (Teaching unit Optional)
MASTER'S DEGREE IN TELECOMMUNICATIONS ENGINEERING (Syllabus 2013). (Teaching unit Optional)
ECTS credits: 5  
Teaching languages: English

Teaching staff

Coordinator: Cap d'estudis de màsters / Jefe de estudios de másteres / Head of master studies
Others: Responsables de grups de recerca / Responsables de grupos de investigación / Heads of research groups

Requirements

The procedure for enrolling this course is as follows:
1- The ETSETB will publish the places of research projects that research groups from universities, research institutes and companies offer. There will be a description of the project, the tasks to be performed and the name of research tutor.
2- The student will contact the research tutor and, if they reach an agreement to do the project, the two of them will make a project proposal with a work plan dimensioned for 5, 10 or 15 ECTS.
3- This project proposal will be submitted by the student to the head of master studies and then the student will be allowed to enrol the number of subjects of introduction to research for which the project is dimensioned.

Degree competences to which the subject contributes

Specific:
CE1. Ability to apply information theory methods, adaptive modulation and channel coding, as well as advanced techniques of digital signal processing to communication and audiovisual systems.
CE2. Ability to develop radio-communication systems: antennas design, equipment and subsystems, channel modeling, link dimensioning and planning.
CE3. Ability to implement wired/wireless systems, in both fix and mobile communication environments.
CE4. Ability to design and dimension transport, broadcast and distribution networks for multimedia signals.
CE5. Ability to design radio-navigation and location systems, as well as radar systems.
CE6. Ability to model, design, implement, manage, operate, administrate and maintain networks, services and contents.
CE7. Ability to plan networks and decision-making about services and applications taking into account: quality of service, operational and direct costs, implementation plan, supervision, security processes, scalability and maintenance. Ability to manage and assure the quality during the development process.
CE8. Ability to understand and to know how to apply the functioning and organization of the Internet, new generation Internet technologies and protocols, component models, middleware and services.
CE9. Ability to deal with the convergence, interoperability and design of heterogeneous networks with local, access and core networks, as well as with service integration (telephony, data, television and interactive services).
CE10. Ability to design and manufacture integrated circuits.
Learning objectives of the subject

The learning results of this subject are:
- Ability to conduct research into new techniques, methodologies, architectures, services or systems in the area of telecommunications engineering.
- Ability to analyse the state of the art on a particular research topic.
- Ability to form hypotheses, propose models and perform experimental validations.
- Ability to plan, organize, develop and present a research topic.
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- Ability to adequately disseminate the results of an investigation.

<table>
<thead>
<tr>
<th>Study load</th>
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<tbody>
<tr>
<td><strong>Total learning time</strong>: 125h</td>
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<tr>
<td>Hours small group: 39h</td>
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<tr>
<td>Self study: 86h</td>
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<tr>
<th>Content</th>
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<tbody>
<tr>
<td><strong>Project development</strong></td>
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<tr>
<td><strong>Learning time</strong>: 125h</td>
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<tr>
<td>Guided activities: 125h</td>
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<tr>
<td><strong>Description</strong>:</td>
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<td>It depends on the contents of the chosen project.</td>
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**Qualification system**

**Evaluation Method**:
- The student will have a research tutor pertaining to the research group that hosts him. If the tutor is not a professor of the UPC, another who is will be assigned.
- By the last day of the examination period, the student will deliver a final report using a research paper format of no more than 6 pages in length. In case that the report is submitted to a conference or to a journal, the student can deliver this paper even if exceeds 6 pages in length.
- If the tutor is not a UPC professor, this tutor will fill a student activity report that will be considered by the UPC professor.
- The tutor who is a UPC professor will propose a grade for the student in the subject, taking into consideration the activity report of the tutor not professor of UPC if there is one.
- If the student enrolls several introduction to research subjects in the same semester, the assessment can be combined, with a single final report and a single student activity report. In this case, the grade will be the same for all introduction to research subjects enrolled in the same semester.

**Bibliography**