



## Course guide

# 300264 - 5GPLAN - 5G Mobile Network Planning

Last modified: 06/06/2024

**Unit in charge:** Castelldefels School of Telecommunications and Aerospace Engineering  
**Teaching unit:** 739 - TSC - Department of Signal Theory and Communications.

**Degree:** MASTER'S DEGREE IN APPLIED TELECOMMUNICATIONS AND ENGINEERING MANAGEMENT (MASTEAM) (Syllabus 2015). (Optional subject).  
MASTER'S DEGREE IN ADVANCED TELECOMMUNICATION TECHNOLOGIES (Syllabus 2019). (Optional subject).

**Academic year:** 2024    **ECTS Credits:** 3.0    **Languages:** English

### LECTURER

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**Coordinating lecturer:** Joan Olmos Bonafé

**Others:** Sílvia Ruiz Boqué

### PRIOR SKILLS

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Radio Communication. Digital Communication System.

### REQUIREMENTS

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Next Generation WiCom and IoT

### DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

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**Generical:**

05 COO. (ENG) Coordinar las tareas de un equipo multidisciplinar para completar las tareas de un proyecto tecnológico o de innovación basado en las TIC.

**Transversal:**

02 SCS. SUSTAINABILITY AND SOCIAL COMMITMENT. Being aware of and understanding the complexity of social and economic phenomena that characterize the welfare society. Having the ability to relate welfare to globalization and sustainability. Being able to make a balanced use of techniques, technology, the economy and sustainability.

05 TEQ. TEAMWORK. Being able to work as a team player, either as a member or as a leader. Contributing to projects pragmatically and responsibly, by reaching commitments in accordance to the resources that are available.

03 TLG. 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.

**Basic:**

CB6. Possess and understand knowledge that provides a basis or opportunity to be original in the development and/or application of ideas, often in a research context.

CB7. Students will be able to apply the acquired knowledge and their ability to solve problems in new or little explored environments in broader (or multidisciplinary) contexts related to their study area.

CB9. Students will be able to communicate their conclusions and the knowledge and ultimate reasons that support them to specialized and non-specialized audiences in a clear and unambiguous manner.

### TEACHING METHODOLOGY

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Project Based Learning and Problem Solving



## LEARNING OBJECTIVES OF THE SUBJECT

At the end of the course the student should be able to:

Understand the latest results, trends, activities and applications in future wireless networks.

Design and plan a realistic network or application.

Include Green Network aspects (spectrum and energy efficiency) in the design of a wireless network.

Define SON algorithms to optimize a wireless network.

Design realistic and multidisciplinary projects working in teams.

## STUDY LOAD

Type	Hours	Percentage
Hours small group	27,0	36.00
Self study	48,0	64.00

**Total learning time:** 75 h

## CONTENTS

### Unit 1: Cellular Network Planning

**Description:**

- o mobile system planning: coverage and capacity optimization
- o main steps in 2G, 3G, 4G planning
- o Green networks: spectrum and energy efficiency
- o Self-Organizing Networks (SON)
- o Radio Resource Management and interference coordination.
- o 5G planning

**Related activities:**

Problem solving related with these topics. Additional readings

**Full-or-part-time:** 10h

Theory classes: 6h

Self study : 4h

### Unit 2: Project on 5G planning

**Description:**

Students working in teams do a real design or platform related with new technologies and experimenting with RRH, NFV, C-RAN, RANaaS, and load balancing.

**Related activities:**

Laboratory activities oriented to do the project.

**Full-or-part-time:** 65h

Laboratory classes: 21h

Self study : 44h

## GRADING SYSTEM

Students have to deliver one or more reports regarding its progress on the project. Project will be evaluated according to technical solution (50%), quality of reports (20%), discussion (20%) and quality of the team (10%).



## BIBLIOGRAPHY

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### Basic:

- Holma, Harri; Toskala, Antti. LTE for UMTS : evolution to LTE-Advanced. 2nd ed. Chichester, UK: John Wiley, cop. 2011. ISBN 9780470660003.

## RESOURCES

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### Audiovisual material:

- Nom recurs. Resource