

Testi del Syllabus

Resp. Did.

Matricola: null

Anno offerta:	2016/2017
Insegnamento:	1006831 - 5G WIRELESS NETWORKS
Corso di studio:	5052 - COMMUNICATION ENGINEERING - INGEGNERIA DELLE TELECOMUNICAZIONI
Anno regolamento:	2016
CFU:	6
Settore:	ING-INF/03
Tipo Attività:	D - A scelta dello studente
Anno corso:	1
Periodo:	Secondo Semestre
Sede:	PARMA



Testi in italiano

Lingua insegnamento	English
Contenuti	5G Wireless Networks Vertical Industries Technology Roadmapping Architectural paradigms Novel Networking Techniques Physical Layer Advances
Testi di riferimento	- 5G Heterogeneous Networks: Self-organizing and Optimization, Authors: Bo Rong, Xuesong Qiu, Michel Kadoch, Songlin Sun, Wenjing Li, ISBN: 9783319393711 - Rolling Out 5G Use Cases, Applications, and Technology Solutions, Authors: Biljana Badic , Christian Drewes , Ingolf Karls , Markus Mueck, ISBN: 9781484215074 - 5G Mobile and Wireless Communications Technology, Editors: Afif Osseiran, Jose F. Monserrat, Patrick Marsch, ISBN: 9781107130098.
Obiettivi formativi	This course will cover the most promising technologies investigated in the context of 5G wireless communications which are planned to be standardized and deployed by 2020. We will start with the main applications that have motivated a new generation of networks and explain various improvements that have been suggested in all communication layers. The attendees will be able to understand the limitations of current networks as well as the requirements of the next generation, motivated by the vertical industries. Furthermore, they will be able to study new architectural paradigms, as well as proposed evolutions in the networking and physical layer of communications.
Prerequisiti	Digital Communications Theory Wireless Communications Basics of Networking Theory Basics of Information Theory
Metodi didattici	Lectures and exercises (approximately with a ratio 80%-20%).

Modalità di verifica dell'apprendimento	Written exams which include both theoretical and critical system design questions based on the taught material.
Programma esteso	<p>Every class = 2 hours</p> <p>Introduction to 5G. Traffic Projections. Key performance indicators and targets. Wireless spectrum & Current Architecture. 5G Vertical Industries & Requirements / e-Health, Factories of the future 5G Vertical Industries & Requirements/ Energy, Automotive Architectural paradigms/ Cloud RAN - Virtualization Architectural paradigms/ From Macro to Pico-cells. HetNets, Self-Organized Networks. Architectural paradigms/ Integration with Satellite, Optical. Architectural paradigms/ Backhauling, Fronthauling. Networking / Software Defined Networking, Network Function Virtualization Networking / Information Centric Networking, Caching. Physical Layer/ Precoding, Beamforming - Theory Physical Layer/ Precoding, Beamforming - Exercises Physical Layer/ Massive MIMO - Theory Physical Layer/ Massive MIMO - Exercises Physical Layer/ mmWave Frequencies, Hybrid Analog Digital -Theory Physical Layer/ mmWave Frequencies, Hybrid Analog Digital -Exercises Physical Layer/ Cooperation and Coordination in Cellular Systems - Theory Physical Layer/ Cooperation and Coordination in Cellular Systems - Exercises Physical Layer/ Cognitive Radio - Theory 1 Physical Layer/ Cognitive Radio - Theory 2 Physical Layer/ Cognitive Radio - Exercises Physical Layer/ Energy efficiency Physical Layer/ IoT Revisit Architecture Topics - Q&A Revisit Networking Topics - Q&A Revisit PHY layer Topics - Q&A</p>

Testi in inglese

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Contenuti	5G Wireless Networks Vertical Industries Technology Roadmapping Architectural paradigms Novel Networking Techniques Physical Layer Advances
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Prerequisiti

Digital Communications Theory
Wireless Communications
Basics of Networking Theory
Basics of Information Theory

Metodi didattici

Lectures and exercises (approximately with a ratio 80%-20%).

Modalità di verifica dell'apprendimento

Written exams which include both theoretical and critical system design questions based on the taught material.

Programma esteso

Every class = 2 hours

Introduction to 5G. Traffic Projections. Key performance indicators and targets.

Wireless spectrum & Current Architecture.

5G Vertical Industries & Requirements / e-Health, Factories of the future

5G Vertical Industries & Requirements/ Energy, Automotive

Architectural paradigms/ Cloud RAN - Virtualization

Architectural paradigms/ From Macro to Pico-cells. HetNets, Self-Organized Networks.

Architectural paradigms/ Integration with Satellite, Optical.

Architectural paradigms/ Backhauling, Fronthauling.

Networking / Software Defined Networking, Network Function Virtualization

Networking / Information Centric Networking, Caching.

Physical Layer/ Precoding, Beamforming - Theory

Physical Layer/ Precoding, Beamforming - Exercises

Physical Layer/ Massive MIMO - Theory

Physical Layer/ Massive MIMO - Exercises

Physical Layer/ mmWave Frequencies, Hybrid Analog Digital -Theory

Physical Layer/ mmWave Frequencies, Hybrid Analog Digital -Exercises

Physical Layer/ Cooperation and Coordination in Cellular Systems - Theory

Physical Layer/ Cooperation and Coordination in Cellular Systems - Exercises

Physical Layer/ Cognitive Radio - Theory 1

Physical Layer/ Cognitive Radio - Theory 2

Physical Layer/ Cognitive Radio - Exercises

Physical Layer/ Energy efficiency

Physical Layer/ IoT

Revisit Architecture Topics - Q&A

Revisit Networking Topics - Q&A

Revisit PHY layer Topics - Q&A