UNIVERSITÀ DI PISA

ELECTRONICS AND COMMUNICATIONS SYSTEMS

GIUSEPPE IANNACCONE

Academic year	2018/19
Course	COMPUTER ENGINEERING
Code	598II
Credits	5

Modules	Area	Type	Hours	Teacher(s)
COMMUNICATIONS SYSTEMS	ING-INF/03	LEZIONI	40	MARCO LUISE
ELECTRONICS SYSTEMS	ING-INF/01	LEZIONI	50	LUCA FANUCCI GIUSEPPE IANNACCONE

Obiettivi di apprendimento

Conoscenze
The main aim of the course is to describe the main architectural features and the underlying technology of the communication systems and equipment that is used in the field of networking, and to provide specific examples of communication systems using such technologies. In particular, the students i) will build-up a general knowledge of the basic technologies that enable the design of wired (copper, fiber) and wireless communication systems; ii) will bear a specific knowledge of the main standard for communications in the transport and access network, and iii) will evaluate the relevance of such standards and technologies in the general context of a wide-area digital communications and computing network.

Modalità di verifica delle conoscenze
Oral Exam

Prerequisiti (conoscenze iniziali)
Basic notions of digital communications and communication networks

Programma (contenuti dell'insegnamento)
a) Components and architecture of an optical-fiber point-to-point link as a segment of the Internet backbone; b) Features, architecture, and technology of the different generations fo cellular networks, with specifical emphasis on European 3G (UMTS), 4G (LTE) and with a short mention to research towards 5G; c) xDSL systems for the access network (last-mile)

Bibliografia e materiale didattico

General:

- Introduction to the Course (slides)
- Il mercato digitale in Italia (slides, in Italian)

Fiber Backbones for the Transport Network:

- II-window FP Laser FP
- III-window DFB Laser with external modulator
- SM Fiber by Corning"SMF 28"
- SM-DS Fiber "Leaf" by Corning

- ITU Specifications G.652 SM Fiber
- EDFA Module
- 12 GHz pin Photodetector
- NEC Equipment
- WDM MRV Solutions

Cellular Networks:

- Breve Introduzione alle Reti Cellulari GSM e UMTS (in Italian)
- An Introduction to Wireless Cellular Communications (G.Bacci, M.Luise)
- Characterization of the Wireless Communication Channel (G.Bacci, M.Luise)
- Basics of UMTS (3G cellular) (G.Bacci, M.Luise)
- Introduction to LTE and Beyond (4G cellular) (G.Bacci, M.Luise)

xDSL technologies for the last mile:

- DSL Technologies for the Access Network

General Reference on Digital Communications:

- J. Proakis: "Digital Communications", 5th Revised edition, McGraw-Hill, Gennaio 2008.

Modalità d'esame
Oral exam, typically two broad qustions on two different selected topics, about 30 minutes overall.

Pagina web del corso
http://www.iet.unipi.it/m.luise/#comsys

Altri riferimenti web
Teacher's Home Page: http://www.iet.unipi.it/m.luise/

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