

Program	09TT- Engineering in Telecommunication Technologies and Services
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Course number and name	
Number	95000067
Name	Connectivity Technologies Sistemas para Conectividad
Semester	Y4-S8

Credits and contact hours	
ECTS Credits	3
Contact hours	36

Coordinator's name	Jesús Sanz Maudes
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Specific course information		
Description of course content		
A short course on the operation, design and construction methods of the elements and systems building the physical layer of local personal or body area networks, both wired or wireless. Auxiliary elements actually used in these technologies are also presented. Practical work using the Development Kits and facilities of the Department located in the laboratory is offered to the students.		
List of topics to be covered		
Elements and systems for wired LAN: Standards and implementations (I2C,SPI for Cis, Ethernet,CAN for hosts and MCUs, USB, PCIe,Firewire for peripherals)		
Elements and systems for WLAN: Standards and implementations (IEEE802.11)		
Elements and systems for WPAN: Standards and implementations (Bluetooth, BLE, IEEE302.15.4/ZigBee). Other implementations (NFC,RFID, EPC Global)		
Elements and systems for wired public network access (last mile): POT, xDSL & FTTx		
Structured cabling and regulations		
Prerequisites or co-requisites		
Recommended: Computer Networks, Analog Electronics, Digital Electronics & Systems		
Course category in the program		
<input type="checkbox"/> R (required)	<input checked="" type="checkbox"/> E (elective)	<input type="checkbox"/> SE (selective elective)

Specific goals for the course
Specific outcomes of instruction
RA287: Understand the basis, specifications and limits of those technologies studied.
RA288: Know the hardware commercial implementation of the connectivity technologies used locally (SOHO).
RA290: Understand the internal structure of the elements forming the systems studied.
RA291: Know how to configure local connectivity elements for specific applications.
Student outcomes addressed by the course

CE-SE1,CE-SE2 , CE-SE3, CG1,CG2 , CG3, CG5, CG9 , CG10

Bibliography and supplemental materials

USB Design by Example . A practical guide to building I/O devices (2nd edition) : John Hyde. Engineer-to-Engineer Series. Intel Press; (February 2001)

USB COMPLETE. The Developer’s Guide. Fourth Edition: Jan Axelson Lakeview Research LLC (2009)

USB Multi-Role Device Design By Example by John Hyde (Cypress Semiconductor in <http://www.usb-by-example.com/Multi-Role.pdf>)

Embedded USB Design By Example (Rev_2.01) by John Hyde in: <http://www.ftdichip.com/Support/Documents/TechnicalPublications/USBDesignByExample.htm>

Ethernet: The Definitive Guide? Charles E. Spurgeon. O’Reilly Media Inc. (2000) ISBN: 1-56592-660-9

802.11 Wireless Networks: The Definitive Guide (2nd. Ed) Matthew Gast. O’Reilly Media Inc. (2005) ISBN: 0-596-10052-3

802.11n A Survival Guide. Matthew S. Gast. O’Reilly EditorsMatthew Gast. O’Reilly Media Inc. (2012) ISBN: 978-1-449-31204-6

802.11ac: A Survival Guide. Matthew S. Gast. O’Reilly EditorsMatthew Gast. O’Reilly Media Inc. (2013) ISBN: 978-1-449-34314-9

ZigBee Wireless Networks and Transceivers Shahin Farahani Newness (Elsevier) (2008) ISBN: 978-0-7506-8393-7

Bluetooth: application developer's guide: the short range interconnect solution David Kammer, Gordon McNutt, Brian Senese; Jennifer Bray, technical editor. ISBN 1-928994-42-3 Rockland, Massachusetts. Syngress, 2002.

Normativa de Infraestructuras Comunes de Telecomunicaciones. (Actualizado a 2011) COIT en http://www.coit.es/index.php?op=publicaciones_detalle&idpublicacion=24

40 work benches each includes: PC in LAN and general electronic instrumentation.

1 Crossbow micaZ WSN kit and several additional spare micaZ radios and sensor boards.(Telemetry Kit, IEEE802.15.4 compliant, TinyOs programmable)

Moteworks Crossbow Software Suite.

2 EA6400 Linksys routers/switches/wireless access points (IEEE 802.11 b/g/n/a/ac compliant),

Hardware and cable for network plug ended and/or plug-in base ended cables construction.(Cat6,5e)

1 Samsung Note 10.4” 2014 Edition as WiFi mapper and notepad for Connectivity practical work.

<https://moodle2.dte.upm.es/scon/> Moodle site for the course

Teaching methodology

X lectures	X problem solving sessions	X collaborative actions	X laboratory sessions
Other: Individual problem solving homework.			