UNIVERSITÀ DI PAVIA

Anno Accademico 2021/2022

INTERNET AND MULTIMEDIA

Enrollment year	2020/2021
Academic year	2021/2022
Regulations	DM270
Academic discipline	ING-INF/03 (TELECOMMUNICATIONS)
Department	DEPARTMENT OF ELECTRICAL,COMPUTER AND BIOMEDICAL ENGINEERING
Course	COMPUTER ENGINEERING
Curriculum	Computer Science and Multimedia
Year of study	2°
Period	1st semester (27/09/2021 - 21/01/2022)
ECTS	6
Lesson hours	46 lesson hours
Language	English
Activity type	ORAL TEST
Teacher	FAVALLI LORENZO (titolare) - 6 ECTS
Prerequisites	General knowledge of protocols. Basic knowledge of mathematical concepts of transform and digital signal processing.
Learning outcomes	The objective of the course is to give to the students the elements to understand the principles behind the various standards (both for codec design and transport protocols) so that they will be able to understand performance and requirements. At the end of the course, it is expected that the student will know - Concepts of information and compression - Techniques to achieve a tradeoff between compression and user-perceived quality - The characteristics of a modern telecommunications network - Network architecture and protocols for content distribution networks.
Course contents	Source coding

	Basic Information Theory. Understanding the meaning of "information content" allows the implementation of compression techniques that remove any unnecessary redundancy. We go through the main definitions and properties of information and entropy and then discuss how efficient codes may be generated. Lossless and lossy coding techniques. Perceptive coding techniques, prediction, transform coding. Audio and video standards Description of audio (PCM, ADPCM, vocoders, MP3) and video (Jpeg, H.26*, MPEG*) coding standards concerning both the aspects of strict coding layer and to the transport layer with file formatting for transmission. Internet basics History, structure and protocols Routing algorithms and their properties: Djikstra and Distance Vector Routing protocols (IGP/BGP, OSPF). Upper layers in IP model Quality of service in telecom networks Older systems: How previous circuit- and packet-based networks dealt with quality, congestion, service management (PSTN, ATM, Frame Relay) Basic introduction to traffic characterization and management. Scheduling algorithm, admission and usage control. Scheduling algorithms IP-QoS: IntServ, DiffServ models MPLS Protocols for multimedia over IP: RTP, SIP, HTML. DASH Platforms: Content distribution networks, P2P
Teaching methods	Class talks given with the support of slides and integrated with the use of blackboard for specific topics.
Reccomended or required readings	Slides, Links, selected papers and book chapters all referenced in during lessons.
Assessment methods	Oral exam. The students are offered the opportunity to select a topic to study in dept and provide a presentation. Such presentation wil not replace the exam but will be an integral part of it.
Further information	
Sustainable development goals - Agenda 2030	$lbl_legenda_sviluppo_sostenibile