Course guide
230025 - CM - Multimedia Communications

Unit in charge:	Barcelona School of Telecommunications Engineering
Teaching unit:	744 - ENTEL - Department of Network Engineering.

Degree:	BACHELOR'S DEGREE IN TELECOMMUNICATIONS TECHNOLOGIES AND SERVICES ENGINEERING (Syllabus 2015). (Optional subject).

Academic year: 2023   **ECTS Credits:** 6.0   **Languages:** Spanish

LECTURER

Coordinating lecturer:	Consultar aquí / See here: https://telecos.upc.edu/ca/estudis/curs-actual/professorat-responsables-coordinadors/responsables-assignatura
Others:	Consultar aquí / See here: https://telecos.upc.edu/ca/estudis/curs-actual/professorat-responsables-coordinadors/professorat-assignat-idioma

PRIOR SKILLS

Basic understanding of IP protocols
TCP and UDP Socket Programming
Fundamentals of source coding, channel coding and cryptography
Fundamentals of digitization and quantification of sound and image

REQUIREMENTS

DATA TRANSMISSION - Precorequisite
INTRODUCTION TO AUDIOVISUAL PROCESSING - Precorequisite
NETWORK APPLICATIONS AND SERVICES - Precorequisite

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Generical:
1. They will have acquired knowledge related to experiments and laboratory instruments and will be competent in a laboratory environment in the ICC field. They will know how to use the instruments and tools of telecommunications and electronic engineering and how to interpret manuals and specifications. They will be able to evaluate the errors and limitations associated with simulation measures and results.

TEACHING METHODOLOGY

Application class
Lectures
Laboratory classes
Individual assignment
Test with long answer
Lab Test
Laboratory

LEARNING OBJECTIVES OF THE SUBJECT

The objective of this course is to train students in aspects of multimedia communications used by audiovisual services and applications. Starting from basics of capture and storage of audiovisual information, the student will acquire the skills needed to locate, request and transport multimedia information over IP networks. Related to the multimedia services to deploy the necessary metrics will be established in order to determine a level of quality experienced by the user.

The expected student learning outcomes are:
a) Have ability to build, operate and manage services and telecom applications, particularly those related mutimedia audiovisual services and applications, including adquisition systems, analog and digital processing, coding, transport, representation, processing, storage, reproduction , management and presentation of these services and applications.
b) Has ability to create, encode, manage, disseminate, distribute, multimedia content, based on criteria of usability and accessibility of audiovisual, broadcast and interactivity.
c) Planning and use the necessary information for a project or academic work.
d) Design experiments and steps to verify hypotheses or to validate the operation of equipment, process, systems or services in the ICT field. Select equipment and performs advanced data analysis with software tools.

STUDY LOAD

Type	Hours	Percentage
Hours large group	39,0	26.00
Hours small group	26,0	17.33
Self study	85,0	56.67

Total learning time: 150 h

CONTENTS

(ENG) Introduction to Multimedia Communications

Description:
Multimedia definition. Multimedia applications and services. Requirements for multimedia communications. Fundamentals of audiovisual coding. Review of audiovisual coding standards.

Full-or-part-time: 47h
Theory classes: 8h
Laboratory classes: 11h
Self study : 28h

(ENG) Multimedia Data Transport over IP networks

Description:
Characteristics of multimedia traffic. Encapsulation of audiovisual contents. Transport protocols. Transport protocols for real time communications. Real time control protocol for media transport.

Full-or-part-time: 65h
Theory classes: 18h
Laboratory classes: 13h
Self study : 34h

(ENG) Establishing and controlling multimedia sessions

Description:
Multimedia session concept. Description multimedia sessions. Multimedia sessions announcements. Protocols for establishing multimedia sessions.

Full-or-part-time: 13h
Theory classes: 5h
Laboratory classes: 1h
Self study : 7h

(ENG) Multimedia Services on IP networks

Description:
Description multimedia services. Video-on-Demand services. Broadcasting Services.

Full-or-part-time: 16h 30m
Theory classes: 4h
Laboratory classes: 1h 30m
Self study : 11h

GRADING SYSTEM

Evaluation:
Quizzes: 60%
Practice tests: 40%

This course will assess generic skills:
- Knowledge of instrumentation and experimental (High Level)

BIBLIOGRAPHY

Basic:
- Kurose, J.F.; Ross, K.W. Computer networking: a top-down approach. 8th ed., global ed. Harlow, United Kingdom: Pearson Education Limited, 2022. ISBN 9781292405469.
- Perkins, C. RTP: audio and video for the Internet. Boston: Addison-Wesley, 2003. ISBN 0672322498.

Complementary:
- Li, Ze-Nian; Drew, Mark S.; Jiangchuan Liu. Fundamentals of multimedia. 3rd ed. Springer, 2021. ISBN 9783030621230.
- Bing, B. Next-generation video coding and streaming. New Jersey: John Wiley & Sons Inc;, 2015. ISBN 1118891309.
- Shin, J.; Lee, D.C.; Kuo, C.C.J. Quality of service for internet multimedia. Upper Saddle River, NJ: Prentice Hall PTR, 2004. ISBN 0131414631.