Subject: Transmission Systems for Audio and Video
Code: 18503
Institution: Escuela Politécnica Superior
Degree: Telecommunication Technologies and Services Engineering
Level: Graduate
Type: Panoramic course
ECTS: 6

1. COURSE TITLE

Transmission Systems for Audio and Video

1.1. Course number

18503

1.2. Course area

Telecommunication Systems

1.3. Course type

Panoramic Course

1.4. Course level

Graduate

1.5. Year

3º

1.6. Semester

2º

1.7. Credit allotment

6

1.8. Prerequisites

- Basic knowledge of physical phenomenon dealing with the electromagnetic propagation.
- Basic knowledge of mathematical operators.

1.9. Minimum attendance requirement

The attendance to the theoretical and laboratory sessions is of vital importance to achievement of the objectives of the signature and to participate in the evaluating tests. Attendance at the practice sessions is compulsory. Student is permitted to be absent two practical sessions justified reasons justified and properly documented to two practice sessions. In this case the lost session must recover within a period of one week in the schedule to be determined by the Professor of practice. Non-attendance unjustified and not recovered more than two practice sessions is the qualification of not suitable in practices, which has as a consequence the overcoming of the subject (see paragraph 5). For favoring a suitable work environment in the laboratory, students will not be allowed to access the laboratory 10 minutes after the beginning of the practice session.

1.10. Faculty data

Add @uam.es to all email addresses below.

Theory:

Dr. Bazil Taha Ahmed (Coordinator)
Departamento de Tecnología Electrónica y de las Comunicaciones
Escuela Politécnica Superior
Office: C-220 Building C – 2ª Floor
Tel.: +34 91 497 6207
e-mail: bazil.taha

Practice:

Dr. Bazil Taha Ahmed (Coordinator)
Departamento de Tecnología Electrónica y de las Comunicaciones
Escuela Politécnica Superior
Office: C-220 Building C – 2ª Floor
Tel.: +34 91 497 6207
e-mail: bazil.taha

1.11. Course objectives

STAV is a signature of the of sound and image itinerary. Student will acquire a basic knowledge about the transmission systems used in audio and video services. The signature tries to develop the ingenuity, tenacity and the ability to solve problems in the field of communication services, audio and video systems.
The objectives intended to be got within this course are:

-Ability to understand the basic concepts of the transmitting and receiving antennas.
-Ability to understand various models of propagation and then using them in the calculation of the working radius of each system.
-Ability to analyze and specify the basic parameters of audio and video communication systems.

UNIT BY UNIT SPECIFIC OBJECTIVES	
Unit 1.- RADIOCOMMUNICATION LINKS	
1.1.	Basic Concept of the antenna
1.2.	Classification of Antennas
1.3.	Study of Antenna´s Parameters
1.4.	Design of Three Types Antennas
Unit 2.- PROPAGATION	
2.1.	Study of the concept of Spherical and Planar Waves
2.2.	Study of Various Models of Propagation
2.3.	Calculation of Diffraction Loss Due to One and Two Obstacles
Unit 3.- MODULATIONS	
3.1.	Study of AM, FM, ASK y MSK
3.2.	Study of ASK , MSK, MPSK, MQAM
Unit 4.- DVB-T Systems	
5.1.	Understanding the concepts of the system
5.1.	Planning of DVB-T Systems
5.1.	Study of the interference effect on system coverage
UNIT 5.- DAB SYSTEMS	
5.1.	Understanding the concepts of the system
5.2.	Planning of DAB Systems
5.3.	Calculation of the System Coverage
UNIT 6.- MOBILE COMMUNIACTIONS SYSTEMS	
5.1.	Study the concepts of Mobile Communications Systems
5.2.	Conceptual study of Various Systems
UNIT 7.- DVB-S SYSTEMS	
7.1.	Conceptual Study of the System
7.2.	Study of the Basic Parameters
7.3.	Uplink and Downlink Budget Calculation
7.4	Solving of Different Examples of Coverage
UNIT 8.- TERRSTRIAL RADIO-LINKS	
8.1.	Study of the General Structure of the Systems
8.2.	Study of the Frequency Planning
8.3.	Study of the Equipment´s Block Diagrams

1.12. Course contents

1. - RADIOCOMUNICATION LINKS
Introduction
Types of Antennas
Antenna`s Parameters
Receiving Power
Link Budget

2. - PROPAGATION
Types of waves
Propagation Models
Attenuation by Knife Edge Obstacles

3. - MODULATIONS
AM, FM
ASK, MSK
BPSK y QPSK
16QAM y 64 QAM
OFDM

4. - DIGITAL TELEVISION SYSTEMS DVB-T
Introduction
Transmitting Antennas
Channel Multiplexing and Coding
DTV-T Emission
Planning of DTV Systems

5. - DIGITAL AUDIO SYSTEMS DAB
Characteristics
Multiplexing
Transmission Modes
DAB Service
Planning of DAB Systems

6. - Mobile Systems
Introduction
D-AMPS
GSM
UMTS

7. - DVB-S Systems
General Aspects
Planning and Basic Parameters
Downlink and Uplink Link Budget
Examples

8. - TERRESTRAIL RADIOLINKS

Introduction
General Structure
Frequency Plan
Equipment's Block-Diagram
Antennas

1.13. Course bibliography

1- "Transmisión por Radio", J. M. Hernando Rábanos, José María, 6ª Edition, 2008. ISBN-13: 978-84-8004-856-9.

2- "Comunicaciones Móviles", J. M. Hernando Rábanos, José María, 2ª edition, 2004. ISBN: 848004635X.

3- "Antenas", Ángel Cardama, Lluis Jofre, Juan Manuel Rius, Jordi Romeu, Sebastián Blanch, Miguel Ferrando. UPC Editions, 2002. Available in the EPS Library as INF/B5260/ANT.

4- "Antenna Theory. Analysis and Design", Constatine Balanis, John Wiley & Sons, 1997. Available in the EPS Library as INF/621.396/BAL.