

SYLLABUS

1. Data about the program of study

1.1	Institution	The Technical University of Cluj-Napoca
1.2	Faculty	Electronics, Telecommunications and Information Technology
1.3	Department	Communications
1.4	Field of study	Electronics and Telecommunications Engineering
1.5	Cycle of study	Bachelor of Science
1.6	Program of study/Qualification	Telecommunications Technologies and Systems
1.7	Form of education	Full time
1.8	Subject code	44

2. Data about the subject

2.1	Subject name	Television Engineering									
2.2	Subject area	Electronics and Telecommunications Engineering									
2.3	Course responsible/lecturer	Lecturer Serban Nicolae MEZA, PhD									
2.4	Teachers in charge of applications	Teaching Assistant Aurelia CIUPE									
2.5	Year of study	IV	2.6	Semester	1	2.7	Assessment	Exam	2.8	Subject category	DID/DOB

3. Estimated total time

Year/ Sem.	Subject name	No. of weeks	Course			Applications			Indiv. study	TOTAL	Credits			
			[hours/ week]			[hours/ semester]								
				S	L	P		S				L	P	
IV/1	Television Engineering	14	2		2			28		28		74	130	5

3.1	Number of hours per week	4	3.2	of which, course	2	3.3	applications	2
3.4	Total hours in the curriculum	56	3.5	of which, course	28	3.6	applications	28
Individual study								Hours
Manual, lecture material and notes, bibliography								40
Supplementary study in the library, online and in the field								-
Preparation for seminars/laboratory works, homework, reports, portfolios, essays								28
Tutoring								3
Exams and tests								3
Other activities								
3.7	Total hours of individual study	74						
3.8	Total hours per semester	130						
3.9	Number of credit points	5						

4. Pre-requisites (where appropriate)

4.1	Curriculum	NA
4.2	Competence	

5. Requirements (where appropriate)

5.1	For the course	Cluj-Napoca
5.2	For the applications	Cluj-Napoca

6. Specific competences

Professional competences	Theoretical Knowledge (what students have to know)	<p>After completing the subject, the student will know about:</p> <ul style="list-style-type: none"> - The basic elements of a TV system - The theory behind the structure of the PAL, SECAM, NTSC TV signal - Aspects regarding image formation and rendering - Basic stages in TV signal amplification and processing - TV system features: teletext, SMARTTV - 3D image rendering methods
	Acquired competencies (what students know to do)	<p>After completing the subject, the student will be able to:</p> <ul style="list-style-type: none"> - Interpret the components of PAL, SECAM and NTSC TV signal - Edit audio-video sequences - Make the 2D to 3D and the 3D to 2D video sequences conversion - Choose and integrate the proper transmission mode for interconnecting video sources to video rendering devices
	Acquired abilities (what tools students know to use)	<p>After completing the subject, the student will be capable to:</p> <ul style="list-style-type: none"> - Use the laboratory equipment: SD/HD TV signal generator, digital oscilloscopes for TV signal measuring - Use commercially available photo and video cameras for recording content - Use dedicated software programmes for video and audio editing - Use stereo-vision and 3D representation systems as well as TV display advanced features such as SmartTV, All Share, etc.
Cross competences	The ability to correlate information.	

7. Discipline objectives (as results from the key competences gained)

7.1	General objectives	Develop professional competencies in the field of television and video systems.
7.2	Specific objectives	<ol style="list-style-type: none"> 1. Acquire general theoretical knowledge about the structure of the television signal 2. Gain the ability to use dedicated software and hardware solution for video editing and processing 3. Analyze and understand 3D image and video based systems

8. Contents

8.1. Lecture (syllabus)		Teaching methods	Notes
1	Television and Video Systems Fundamentals	Presentation, heuristic conversation, exemplification, problem presentation, teaching	Use of .ppt presentation, projector, blackboard
2	The Basic Structure of the Television Signal		
3	Color in Television and Video		
4	Television Standards		
5	Digital Television		
6	Video Sensors/Sources		
7	Video Rendering Devices		

8	Storing and Transmitting Video	exercise, case study, formative evaluation	
9	A/V Dedicated Equipment and Systems		
10	(Inter)-Connecting TV Equipment		
11	3D Video Display		
12	3D Video Acquisition & Processing		
13	Emerging TV and Video Technologies		
14	Revision. Preparation for the final exam.		
8.2. Applications (lab)		Teaching methods	Notes
1	Introduction. Laboratory and general equipment presentation. Safety regulations.	Didactic and experimental proof, didactic exercise, team work	Use of laboratory instrumentation, experimental boards, computers, audio & video acquisition boards
2	The Black and White TV Signal		
3	The PAL TV Signal		
4	The NTSC and SECAM TV Signal		
5	Introduction to Adobe Premier		
6	Advanced Video Editing in Adobe Premier		
7	Adding Video Effects and Transitions in Adobe After Effects		
8	Presenting Video Sequences Using Adobe Encore		
9	The RGB to PAL/SECAM Video Signal Conversion		
10	Linear Video Editing and Mixing		
11	Video Switching Matrixes		
12	Professional Photo and Video Cameras		
13	Introduction to 3D TV and Stereoscopic Vision.		
14	Lab recovery and final evaluations		
Bibliography			
<ol style="list-style-type: none"> 1. A.Vlaicu - Televiziune alb-negru și color, Ed. Compress, 1994 2. A. Vlaicu - Transmisia și recepția semnalelor de televiziune, Ed. Interferente, 1995 3. B. Orza, D. Ivascanu, A. Vlaicu, T. Samuila – Televiziune aplicată, Ed. UTPress, Cluj-Napoca, 2007 4. J. Whitaker – Master Handbook of Video Production – Ed. McGraw-Hill, 2007 5. H. Zettl – Television Production Handbook – Ed. Thomson&Wadsworth, 2006 6. J. Rice, B. McKernan – Creating digital content - Ed. McGraw-Hill, 2002 7. A Guide to Standard and High-Definition Digital Video Measurements – Tektronics 8. B. Orza, Ș. Meza – Ingineria sistemelor de televiziune – fascicule de laborator (14 fascicule) – 2012 9. B. Orza – prezentări PowerPoint materiale de curs 10. Y.Wang, J. Ostermann, Y.Zhang, VIDEO PROCESSING AND COMMUNICATIONS – Prentice Hall, 2002 			

9. Bridging course contents with the expectations of the representatives of the community, professional associations and employers in the field

Gain competences will be used by employees working in the field of television systems and video engineering, in the field of audio-video editing applications, in television studios.

10. Evaluations

Activity type	10.1	Assessment criteria	10.2	Assessment methods	10.3	Weight in the final grade
Course		The level of acquired theoretical knowledge and practical skills		- Summative evaluation written exam (theory and problems)		E, max 10 pts. 60%
Applications		The level of acquired abilities		- Continuous formative evaluation - practical lab test - lab mini project - lab portofolio assesment		L, max. 10 pts. 40%
10.4 Minimum standard of performance						

$$L \geq 5 \text{ and } E \geq 4.5 \text{ and } 0.6E+0.4L \geq 4.5$$

Date of filling in	Course responsible	Teachers in charge of applications
01.10.2014	Lecturer Serban Nicolae MEZA, PhD	Teaching Assistant Aurelia CIUPE,

Date of approval in the department 01.10.2014	Head of Communications Department Professor Virgil DOBROTA, PhD
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