Technical University of Cluj-Napoca
Qualification:
Fundamental field: Engineering sciences
Field of study: Electronics and Telecommunications Engineering
Study program: Technologies and Telecommunications Systems – English language

Faculty of Electronics, Telecommunications and Information Technology
Level of education: B.Sc., current curricula for 2020-2021

Annex 3.4.1
Grid 2. *Correlations between professional and transversal competences and content areas, study disciplines and assigned credits*

Professional competences	Explicit competences through level descriptors	Content areas	Disciplines	Credits	
				Per discipline*	Per competence
C1. Use of the fundamental elements related to devices, circuits, systems, instrumentation and electronic technology	C1.1 Description of the functioning of electronic devices and circuits and of the fundamental methods of measuring electrical parameters C1.2 Analysis of electronic circuits and systems of low/ medium complexity, for the purpose of designing and measuring them C1.3 Diagnosis/ troubleshooting of electronic circuits, equipment and systems C1.4 Use of electronic tools and specific methods to characterize and evaluate the performance of electronic circuits and systems C1.5 Design and implementation of electronic circuits of low/ medium complexity using CAD-CAM technologies and standards in the field		Mathematical Analysis	4.0	2.0
			Linear Algebra, and Analytic and Differential Geometry	5.0	2.0
			Physics I	4.0	1.5
			Special Mathematics	5.0	2.0
			Differential Equations	5.0	2.0
			Physics II	4.0	1.5
			Graphics on Computer Aided Design	4.0	2.0
			Practical Work in the Domain of Study (4 weeks)	4.0	2.0
			Passive Components and Circuits	5.0	2.0
			Electronic Devices	5.0	2.0
			Basics of Electrotechnics I	4.0	2.0
			Basics of Electrotechnics II	4.0	2.0
			Signals and Systems	5.0	1.5
			Materials for Electronics	4.0	1.5
			Digital Integrated Circuits	4.0	1.0
			Fundamental Electronic Circuits	5.0	2.0
			Measurements in Electronics and Telecommunications	4.0	1.0
			Microwaves	4.0	2.0
			Analysis and Synthesis of Circuits	5.0	2.0
			Analog Integrated Circuits	5.0	2.0
			Systems with Digital Integrated Circuits	5.0	1.0
			CAD Techniques	4.0	1.0
			Systems with Analog Integrated Circuits	5.0	1.0
			Optoelectronics	5.0	2.0
C2. Applying the basic methods for the acquisition and processing of signals	C2.1 Temporal, spectral and statistical characterization of signals C2.2 Explaining and interpreting the methods of signal acquisition and processing C2.3 Use of simulation media for signal analysis and processing C2.4 Use of specific methods and tools for signal analysis C2.5 Design of basic functional		Mathematical Analysis	4.0	1.0
			Linear Algebra, and Analytic and Differential Geometry	5.0	2.0
			Physics I	4.0	1.0
			Computer Programming and Programming Languages I	5.0	1.0
			Special Mathematics	5.0	2.0
			Differential Equations	5.0	2.0
			Physics II	4.0	1.0
			Practical Work in the Domain of Study (4 weeks)	4.0	1.0

	blocks for digital signal processing with hardware and software implementation		Electronic Devices	5.0	1.0
			Signals and Systems	5.0	1.5
			Digital Integrated Circuits	4.0	0.5
			Fundamental Electronic Circuits	5.0	1.0
			Measurements in Electronics and Telecommunications	4.0	1.0
			Microwaves	4.0	1.0
			Analysis and Synthesis of Circuits	5.0	2.0
			Analog Integrated Circuits	5.0	2.0
			Systems with Digital Integrated Circuits	5.0	1.0
			CAD Techniques	4.0	1.0
			Systems with Analog Integrated Circuits	5.0	2.0
			Information and Coding Theory	5.0	3.0
			Television Engineering	5.0	1.0
			Digital Signal Processing	4.0	3.0
C3. Application of the basic knowledge, concepts and methods regarding the architecture of computer systems, microprocessors, microcontrollers, languages and programming techniques	C3.1 Description of the functioning of a computing system, of the basic principles of the architecture of general-purpose microprocessors and microcontrollers, of the general principles of structured programming C3.2 Use of general-purpose and specific programming languages to microprocessor and microcontroller applications; explaining the functioning of automatic control systems that use these architectures and interpreting experimental results C3.3 Solving concrete practical problems including elements of data structures and algorithms, programming and use of microprocessors or microcontrollers C3.4 Elaboration of programs in a general and/ or specific programming language, starting from the specification of the requirements to the execution, debugging and interpretation of the results in correlation with the processor used. C3.5 Development of projects involving hardware components (processors) and software components (programming)		Mathematical Analysis	4.0	1.0
			Linear Algebra, and Analytic and Differential Geometry	5.0	1.0
			Computer Programming and Programming Languages I	5.0	2.0
			Applied Informatics	5.0	2.0
			Special Mathematics	5.0	1.0
			Differential Equations	5.0	1.0
			Computer Programming and Programming Languages II	5.0	2.0
			Graphics on Computer Aided Design	4.0	1.0
			Practical Work in the Domain of Study (4 weeks)	4.0	1.0
			Signals and Systems	5.0	1.0
			Digital Integrated Circuits	4.0	1.0
			Systems with Digital Integrated Circuits	5.0	1.0
			CAD Techniques	4.0	1.0
			Microprocessors Architecture	5.0	3.0
			Information and Coding Theory	5.0	2.0
			Software Engineering	4.0	2.0
			Microprocessors-Based Systems	4.0	2.0
			Television Engineering	5.0	1.0
			Digital Signal Processing	4.0	1.0
			Multimedia Technologies	**5.0**	**2.0**
			Speech Processing	**5.0**	**2.0**
			Media Processors	**5.0**	**2.0**
			Signal Processors	**5.0**	**2.0**
C4. Design, implementation and operation of data, voice, video and multimedia services. This is based on	C4.1 Identification of the fundamental concepts regarding the transmission of information and analog and digital		Physics I	4.0	0.5
			Computer Programming and Programming Languages I	5.0	1.0
			Applied Informatics	5.0	2.0

the understanding and the application of fundamental concepts in telecommunications and transmission of information	communications C4.2 Solving practical problems using general knowledge of multimedia techniques C4.3 Explanation and interpretation of the main requirements and specific approach techniques for data, voice, video, multimedia transmissions C4.4 Solving practical problems using general knowledge of multimedia techniques C4.5 Use of the main specific parameters in evaluations based on the concept of quality of service in communications C4.6 Development of simple communications services C4.7 Passing an examination regarding the main characteristics of the usual communications services		Physics II	4.0	0.5
			Computer Programming and Programming Languages II	5.0	2.0
			Passive Components and Circuits	5.0	1.0
			Electronic Devices	5.0	1.0
			Basics of Electrotechnics I	4.0	1.0
			Signals and Systems	5.0	1.0
			Materials for Electronics	4.0	0.5
			Digital Integrated Circuits	4.0	1.0
			Fundamental Electronic Circuits	5.0	1.0
			Measurements in Electronics and Telecommunications	4.0	1.0
			Analysis and Synthesis of Circuits	5.0	1.0
			Analog Integrated Circuits	5.0	1.0
			Systems with Digital Integrated Circuits	5.0	1.0
			CAD Techniques	4.0	1.0
			Systems with Analog Integrated Circuits	5.0	1.0
			Microprocessors Architecture	5.0	1.0
			Optoelectronics	5.0	2.0
			Software Engineering	4.0	1.0
			Web Technologies and Databases	5.0	3.0
			Decision and Estimation in Information Processing	3.0	1.0
			Television Engineering	5.0	1.0
			Modulation Techniques	5.0	2.0
			Telephony	3.0	1.0
			Switching and Routing Systems	4.0	2.0
			Radio Communications	4.0	1.0
			Computer Networks	4.0	1.0
			Internet Protocols	5.0	2.0
			Mobile Communications	**5.0**	**2.0**
			Cellular Radio Communications	4.0	1.0
			Data Transmissions	4.0	2.0
			Optoelectronic Systems in Telecommunications	**5.0**	1.0
			Applied Electronics	**5.0**	1.0
			Digital Audio-Video Techniques	4.0	2.0
			Digital Image Processing	4.0	2.0
			Multimedia Technologies	**5.0**	2.0
			Speech Processing	**5.0**	2.0
			Media Processors	**5.0**	2.0
			Signal Processors	**5.0**	2.0
C5. Selecting, installing, configuring and operating fixed or mobile telecommunications equipment. Equipping a site with usual telecommunications networks	C5.1 Defining the principles of the main technologies for fixed and mobile telecommunications, through various transmission media C5.2 Explanation and interpretation of the technologies and of fundamental protocols for integrated fixed and mobile communications systems		Physics I	4.0	0.5
			Computer Programming and Programming Languages I	5.0	1.0
			Applied Informatics	4.0	1.0
			Physics II	4.0	0.5
			Computer Programming and Programming Languages II	4.0	1.0
			Electronic Devices	5.0	1.0
			Basics of Electrotechnics I	4.0	1.0
			Basics of Electrotechnics II	4.0	0.0

	C5.3 Installation, configuration and exploiting of communications networks C5.4 Use of evaluation techniques and diagnostics for communications systems and equipment C5.5 Endowment with communications means of a location with a small/ medium degree of complexity C5.6 Solving an installation and maintenance problem for a communications system with low/ medium complexity.		Materials for Electronics	4.0	0.5
			Digital Integrated Circuits	4.0	0.5
			Fundamental Electronic Circuits	5.0	1.0
			Measurements in Electronics and Telecommunications	4.0	1.0
			Systems with Digital Integrated Circuits	5.0	1.0
			Systems with Analog Integrated Circuits	5.0	1.0
			Microprocessors Architecture	5.0	1.0
			Optoelectronics	5.0	1.0
			Software Engineering	4.0	1.0
			Web Technologies and Databases	5.0	2.0
			Microprocessors-Based Systems	4.0	1.0
			Decision and Estimation in Information Processing	3.0	1.0
			Modulation Techniques	5.0	2.0
			Telephony	3.0	1.0
			Switching and Routing Systems	4.0	2.0
			Radio Communications	4.0	1.0
			Computer Networks	4.0	2.0
			Internet Protocols	5.0	3.0
			Mobile Communications	4.0	2.0
			Project – IOT Systems	**2.0**	**1.0**
			Data Transmissions	4.0	1.0
			Cellular Radio Communications	4.0	1.0
			Optoelectronic Systems in Telecommunications	**5.0**	1.0
			Applied Electronics	**5.0**	**1.0**
			Digital Audio-Video Techniques	4.0	1.0
			Digital Image Processing	4.0	2.0
			Multimedia Technologies	**5.0**	1.0
			Speech Processing	**5.0**	1.0
			Media Processors	**5.0**	1.0
			Signal Processors	**5.0**	1.0
C6. Solving specific problems of the broadband communications networks: propagation in different environment, circuits and equipment for high frequencies (microwaves and optical).	C6.1 Identification/ definition/ presentation of the electromagnetic field laws addressing specific propagation and transmission issues, as well as of the specific circuits C6.2 Explaining the specific methods for implementation of the communications techniques C6.3 Solving practical problems using design methods of the microwave circuits, planning, coverage, selection and location of transmission and receiving equipment C6.4 Use of the main quality parameters and measurement techniques specific to the propagation and transmission		Physics I	4.0	0.5
			Physics II	4.0	0.5
			Graphics on Computer Aided Design	4.0	1.0
			Passive Components and Circuits	5.0	2.0
			Basics of Electrotechnics II	4.0	2.0
			Materials for Electronics	4.0	1.5
			Microwaves	5.0	1.0
			Decision and Estimation in Information Processing	3.0	1.0
			Television Engineering	5.0	1.0
			Modulation Techniques	5.0	1.0
			Telephony	3.0	1.0
			Radio Communications	4.0	2.0
			Computer Networks	4.0	1.0
			Mobile Communications	4.0	1.0
			Project – IOT Systems	**2.0**	**1.0**
			Data Transmissions	4.0	1.0
			Cellular Radio Communications	4.0	**1.0**
			Optoelectronic Systems in	**5.0**	**3.0**

		Telecommunications		
C6.5 Development of low/ medium complexity projects regarding the transmission and receiving equipment		Applied Electronics	**5.0**	**3.0**
		Digital Audio-Video Techniques	4.0	1.0
		Elaboration of the Graduation Thesis	**4.0**	**1.0**
C6.6 Passing an examination regarding the principles of operation and use of the transmission and receiving equipment		Practice for Development of Graduation Thesis	**4.0**	**1.0**

Transversal competences	Disciplines	Credits	
		Per discipline*	**Per competence**
CT1 **Methodical analysis of the problems encountered in the activity, identifying the elements for which there are established solutions, thus ensuring the fulfillment of professional tasks.**	Foreign Language 1	2.0	1.0
	Foreign Language 2	2.0	1.0
	Television Engineering	5.0	1.0
	Project Management	**2.0**	1.0
	Entrepreneurial Education	**2.0**	**1.0**
	Ethics and Academic Integrity	**2.0**	**1.0**
	Elaboration of the Graduation Thesis	**4.0**	**1.0**
	Practice for Development of Graduation Thesis	**4.0**	**1.0**
CT2 **Defining the activities in each stage and distributing them to the subordinates with the complete explanation of the duties, according to the hierarchical levels. It ensures the efficient exchange of information and inter-human communication.**	Physical Education and Sport II	2.0	1.0
	Project Management	**2.0**	1.0
	Entrepreneurial Education	**2.0**	**1.0**
	Ethics and Academic Integrity	**2.0**	**1.0**
	Foreign Language	1.0	1.0
	Financial Management	3.0	1.0
	Marketing	3.0	1.0
	Elaboration of the Graduation Thesis	**4.0**	**1.0**
	Practice for Development of Graduation Thesis	**4.0**	**1.0**
CT3 **Adaptation to new technologies, professional and personal development, through continuous training. Use of printed documentation sources, specialized software and electronic resources in Romanian and in (at least) one language of international circulation.**	Foreign Language 1	2.0	1.0
	Physical Education and Sport I	2.0	2.0
	Foreign Language 2	2.0	1.0
	Physical Education and Sport II	2.0	1.0
	Financial Management	3.0	0.5
	Marketing	3.0	0.5
	Elaboration of the Graduation Thesis	**4.0**	**1.0**
	Practice for Development of Graduation Thesis	**4.0**	**1.0**

* It will be mentioned the number of credits by which the respective discipline contributes to the achievement of the competences, out of the total credits allocated to the subject according to the education plan.

NOTE: Changes compared to 2019-2020 are displayed with bold and red colour.