الجمهورية الجزائرية الديمقراطية الشعبية

People's Democratic Republic of Algeria

وزارة التعليم العالي والبحث العلمي

Ministry of Higher Education and Scientific Research

اللجنة البيداغوجية الوطنية لميدان العلوم و التكنولوجيا

National Pedagogical Committee for the Field of Science and Technology

Academic Master's 1 Program (Harmonized)

National Program
Updated: 2022

Domain: Sciences and Technologies

Field: Telecommunications
Specialization: Networks and Telecommunications

Admission Conditions

(Indicate the bachelor's specializations that provide access to the Master's program)

Field	*Harmonized Master's*	*Specializations Providing Access to the Master's*	*Compatibility Rating*	*Coefficient Assigned to the Bachelor's Degree*
Telecommunications	Networks and Telecommunications	Telecommunications	**1**	*1.00*
		Electronics	**2**	*0.80*
		Biomedical Engineering	**3**	*0.70*
		Automation	**3**	*0.70*
		Other ST Domain Licenses (Group A)	**5**	*0.60*

Semester Organization Sheets

Semester 1

Teaching Unit	Subjects/ Titles	Credits	Coefficient	Weekly Hours (Course/ Tutorials /Labs)	Semester Hours (15 weeks)	Complementary Work	Evaluation Mode Continuous/Exam	
Fundamental TU (FTU 1.1.1)	Advanced Digital Communications	6	3	3h Course 1h30 Tutorials	67h30	82h30	40%	60%
	IP Routing	4	2	1h30 Course 1h30 Tutorials	45h00	55h00	40%	60%
Fundamental TU (FTU 1.1.2)	Propagation and Antennas	4	2	1h30 Course 1h30 Tutorials	45h00	55h00	40%	60%
	Advanced Signal Processing	4	2	1h30 Course 1h30 Tutorials	45h00	55h00	40%	60%
Methodological TU (MTU 1.1)	Lab Advanced Digital Communications	2	1	1h30 Labs	22h30	27h30	100%	
	Lab IP Routing	2	1	1h30 Labs	22h30	27h30	100%	
	Lab Advanced Signal Processing	2	1	1h30 Labs	22h30	27h30	100%	
	Object-Oriented Programming in Python	3	2	1h30 Course	37h30	37h30	40%	60%
Discovery TU (DTU 1.1)	Elective Subject 1	1	1	1h30 Course	22h30	02h30	100%	
	Elective Subject 2	1	1	1h30 Course	22h30	02h30	100%	
Transversal TU(TTU 1.1)	Technical English and Terminology	1	1	1h30 Course	22h30	02h30	100%	

Total Semester 1: 30 Credits, 17 Coefficients, 375h00

Semester 2

Teaching Unit	Subjects/ Titles	Credits	Coefficient	Weekly Hours (Course/ Tutorials/ Labs)	Semester Hours (15 weeks)	Complementary Work	Evaluation-Mode Continuous/Exam	
Fundamental UE (FTU 1.2.1)	Network Services Administration	6	3	3h Course 1h30 Tutorials	67h30	82h30	40%	60%
	DSP and FPGA	4	2	1h30 Course 1h30 Tutorials	45h00	55h00	40%	60%
Fundamental UE (FTU 1.2.2)	Transmission Channels and Optical Components	4	2	1h30 Course 1h30 Tutorials	45h00	55h00	40%	60%
	Coding and Compression	4	2	1h30 Course 1h30 Tutorials	45h00	55h00	40%	60%
Methodological UE (MTU 1.2)	Lab Network Services Administration	2	1	1h30 Labs	22h30	27h30	100%	
	Lab DSP and FPGA	2	1	1h30 Labs	22h30	27h30	100%	
	Lab Coding and Compression	2	1	1h30 Labs	22h30	27h30	100%	
	High-Speed Networks	3	2	1h30 Course 1h Labs	37h30	37h30	40%	60%
Discovery TU (DTU 1.2)	Elective Subject 1	1	1	1h30 Course	22h30	02h30	100%	
	Elective Subject 2	1	1	1h30 Course	22h30	02h30	100%	
Transversal TU (TTU 1.2)	Respect for Standards and Ethical Rules	1	1	1h30 Course	22h30	02h30	100%	

Total Semester 2: 30 Credits, 17 Coefficients, 375h00

Elective Subjects for Discovery Units (S1, S2)

1. Linux System
2. Standards and Protocols
3. Data Representation in Images and Videos
4. Satellite Networks
5. Internet of Things (IoT)
6. Field Networks
7. Operator Networks
8. Wireless Sensor Networks
9. Electromagnetic Compatibility
10. Embedded Systems and Telecommunications
11. Radar Techniques
12. Space Telecommunications
13. Radionavigation System
14. Emerging Areas in Optical Telecommunications
15. Optical Fiber Installation and Maintenance
16. Radio Engineering
17. VSAT Technology
18. Propagation of Acoustic Microwaves in Piezoelectric Solids
19. RF and Microwave Measurements
20. Portable Micro-Antennas
21. Emerging Telecommunication Systems
22. Theoretical Physics of Optical and Microwave Analogies
23. Biological Effects of Electromagnetic Waves (Bioelectromagnetism)
24. CAD for Telecom Circuits
25. Characterization of RF Devices

Semester 1 – Teaching Objectives by Subject

Subject Title	Teaching Objectives
Advanced Digital Communications	Understand and analyze advanced communication systems including non-ideal channels, multiple access methods, and MIMO systems. Learn to assess transmission chain performance using concepts like BER, SNR, and spectral efficiency.
IP Routing	Grasp routing decisions in meshed IP networks. Learn both static and dynamic routing mechanisms including RIP, EIGRP, and OSPF. Understand VLANs, redundancy, EtherChannel, and routing protocols.
Propagation and Antennas	Analyze wave propagation through ground-level and atmospheric environments and understand antenna radiation characteristics. Study practical scenarios such as satellite links and antenna arrays.
Advanced Signal Processing	Apply stochastic process concepts and spectral analysis to real signals. Explore FIR/IIR filters, adaptive filtering (LMS, RLS), time-frequency, and wavelet-based analysis.
Lab: Advanced Digital Communications	Simulate digital transmission chains using MATLAB/Simulink. Study digital modulation (BASK, BPSK, QAM), and implement OFDM, CDMA, and MIMO systems.
Lab: IP Routing	Practice real/simulated router and switch configurations for VLANs, inter-VLANs, EtherChannel, static/dynamic routing (RIP, OSPF, EIGRP).
Lab: Advanced Signal Processing	Implement signal filtering and denoising using MATLAB. Use spectral analysis, LMS filtering, and wavelet transforms for signal analysis.
Object-Oriented Programming in Python	Master OOP fundamentals and advanced patterns in Python. Learn design patterns, containers, and iterators for robust software development.
Elective Subjects (e.g., Linux, Standards)	Gain specialized knowledge in selected emerging or practical areas like Linux systems or communication protocols.
Technical English and Terminology	Develop technical vocabulary, reading comprehension, and oral/written skills for scientific communication in English.

Semester 2 – Teaching Objectives by Subject

Subject Title	Teaching Objectives
Network Services Administration	Learn to operate and manage network services (DNS, DHCP, LDAP, Email, FTP). Master administrative tools and security in client-server models and domain management.
DSP and FPGA	Design and implement DSP algorithms. Understand DSP architecture and peripherals, use Code Composer Studio, and get introduced to FPGA architecture and applications.
Transmission Channels and Optical Components	Analyze wave propagation in transmission lines and optical fibers. Study optical components (passive/active) and optical network architectures.
Coding and Compression	Understand and apply source/channel coding and image compression techniques including Huffman, LZW, convolutional, and turbo codes. Evaluate their efficiency and applications.
Lab: Network Services Administration	Perform network server setup and administration (DNS, DHCP, Web, FTP, AD) on Linux/Windows platforms. Gain hands-on practice in remote and secure network management.
Lab: DSP and FPGA	Develop and implement DSP applications on hardware. Program interrupts, digital filters, FFT, and gain introductory VHDL skills.
Lab: Coding and Compression	Simulate source/channel coding techniques and compression methods in practical scenarios. Apply methods like Shannon-Fano, Huffman, DCT.
High-Speed Networks	Study transport networks (PDH, SDH, DWDM), MPLS, VPN, and WAN technologies. Analyze protocols and design high-speed communication networks.
Elective Subjects (e.g., Image/Video, Satellite)	Explore specialized topics like image/video processing (OpenCV), or satellite communication systems including GPS and VSAT.
Respect for Standards and Ethics	Instill ethical and professional conduct in academic/research settings. Emphasize intellectual property, research integrity, and ethical aspects of technology use.