University POLITEHNICA of Bucharest
Facultyof Electronic, Telecommunications and Information Technology

COURSE DESCRIPTION

1. Data about the program

1.1 Higher education institution	University POLITEHNICA of Bucharest
1.2 Faculty	Electronic, Telecommunications and Information Technology
1.3 Department	Telecommunications
1.4 Study field	Electronic Engineering, Telecommunications and Informational Technologies
1.5 Cycle of studies	License
1.6 Study program	Technologies and Systems of Telecommunications (TSTeng)

2. Data on discipline

2.1 Course title				Communications Networks			
2.2 Lecturer				Lect. PhD Eng.Șerban Georgică Obreja			
2.3 Instructor for practical activities				Lect. PhD Eng. Șerban Georgică Obreja			
2.4 Year of study	IV	2.5 Semester	7	2.6 Evaluation type	Exam	2.7 Type of class	Mandatory

3. Total estimated time (hours per semester for academic activities)

3.1 Number of hours per week, out of which	3,5	3.2 course	2	3.3. practical activities	1,5
3.4 Total hours in the curricula, out of which	49	3.5 course	28	3.6 practical activities	21
Distribution time					ore
Study according to manual, course support, bibliography					10
Supplemental documentation (library, electronic access resources, etc)					20
Preparation for practical activities, seminar / laboratory, homework, essays, portfolio, etc					20
Tutoring					-
Examinations					5
Other activities					-

3.7 Total hours of individual study	55
3.9 Total hours per semester	104
3. 10 Number of ECTS credits points	4

4. Prerequisites (where applicable)

4.1 curricular	Programming Languages, Analog and Digital Communications, Architectures for Networking and Internet
4.2 competence-based	Not applicable

5. Prerequisites (where applicable)

5.1 for running the course	Not applicable
5.2 for running of the applications	Mandatory attendance at laboratories

6. Specific acquired competences

Professional competences	Design, implementation and operation of data, voice, video, multimedia services, based on understanding and applying the fundamental concepts of communication and information transmission. Selection, installation and operation of fixed and mobile telecommunication equipment and network design to ensure a common telecommunications site.
Transversal competences	-

7. The discipline objectives

7.1 General objective of the course	Familiarize students with the concepts required to design and implement an IP-based telecommunications networks. Implementation of telecommunications protocols.
7.2 Specific objectives	Gaining of specific engineering skills in telecommunications networks: network planning, configuring parameters and protocols, functional testing, fault diagnosis.

8. Contents

8.1 Course	Teaching methods	Observations
Introduction: Layered model; OSI model; TCP-IP stack.	It uses both the projector mainly for presentation of charts, graphs, main ideas and so on, as well as sheets for calculations, demonstrations, etc.. The course has an interactive nature, aiming at asking questions and getting answers from the students, which helps them to understand the concepts taught.	1 hour
Physical Layer: Data Transmission; Wired and Wireless Transmissions.		3 hours
Data Link: logical representation of data; Error Control; Flux Control; Medium Access; queuing disciplines; layer 2 protocols.		6 hours
Netowrk Layer: routing		8 hours

algorithms; IP protocol; QoS.		
Transport Layer: Congestion Control; TCP and UDP protocols.		8 hours
Application Layer: Overlay networks; P2P; CDN; overlay routing.		2 hours
Bibliography: -Andrew S. Tanenbaum, "Computer Networks", fourth edition, Prentice Hall, 2003. - Larry L. Peterson & Bruce S. Davi, "Computer networks: a systems approach"– 4th ed., Elsevier, Inc., 2007. - Tatiana Radulescu, "Retele de Telecomunicatii", Ed. Thalia -Sisteme digitale de comutatie, vol.1, Eugen Borcoci, Ed.Vega, 1995		

8.2 Laboratory	Teaching techniques	Remarks
Introduction to Linux; Tools for testing and analyzing TCP/IP. Internet addressing; Configuring IP connectivity: addressing, static routing, testing.	Laboratory work is done in teams of two students each, having available a computer with Linux operating system. Equipment used for the study of technologies and network protocols: Cisco switches and routers, IBM, Huawei	3 hours
Dynamic routing: protocolul RIP.		3 hours
Dynamic routing: protocolul OSPF.		3 hours
IPv6 addressing		3 hours
Interdomain routing: BGP protocol.		3 hours
Traffic filtering with Access Lists.		3 hours

9. Discipline contents connection with expectation of epistemic community representatives, of professional associations and of major employers in the program field

Global telecommunications market has grown explosively in recent years, resulting in a very dynamic industry that requires many specialists in telecommunications systems. In Romania, this field is highly developed, on the market there are companies that need engineers for all subdomains that are related to a modern telecommunications system: engineers to design and implement telecommunication equipment, engineers specialized in the development, operation and maintenance of the telecommunications systems, engineers specialized developing applications for telecommunication systems.
Course objective, namely acquisition by students of the basic notions related to the design, operation and diagnosis of telecommunication networks, meet market requirements of telecom. This provides graduates with the appropriate skills and training needs of current qualifications Scientific and Technical enabling rapid employment after graduation.

10. Evaluation

Activity type	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Percentage of final grade
10.4 Course	- Understanding the theory associated with the functioning of telecommunications networks; - Knowledge of the application of theory to specific problems;	-tests during the semester	20%
		-Final Exam	40%
10.5 Laboratory	Conducting 6 laboratories + an individual practical test on the final laboratory day	Laboratories	20%
		Practical test	20%
10.6 Minimum performance standard			
- 50 points out of 100 under License Regulation of UPB.			

Date | Lecturer | Instructor for practical activities

05.09.2017 Lect. PhD Eng.Șerban Georgică Obreja Lect. PhD Eng. Șerban Georgică Obreja

Date of department approval
25.09.2017

Director of Department
Assoc.Prof. PhD Eng. Eduard Popovici