Politehnica University of Bucharest
Faculty of Electronics, Telecommunications and Information Technology

COURSE DESCRIPTION

1. Program identification information

1.1 Higher education institution	Politehnica University of Bucharest
1.2 Faculty	Electronics, Telecommunications and Information Technology
1.3 Department	Telecommunications
1.4 Domain of studies	Electronic Engineering, Telecommunications and Informational Technologies
1.5 Cycle of studies	License
1.6 Program of studies/Qualification	Technologies and Systems of Telecommunications (TSTeng)

2. Course identification information

2.1 Name of the course				Network Architectures and Internet			
2.2 Lecturer				Lecturer PhD Radu Alexandru BADEA			
2.3 Instructor for practical activities				Lecturer PhD Radu Alexandru BADEA			
2.4 Year of studies	III	2.5 Semester	II	2.6 Evaluation type	Verification	2.7 Course choice type	Compulsory

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

3.1 Number of hours per week, out of which	3	3.2 course	2	3.3 practical activities	1
3.4 Total hours in the curricula, out of which	42	3.5 course	28	3.6 practical activities	14

Distribution of time	hours
Study according to the manual, course support, bibliography and hand notes	25
Supplemental documentation (library, electronic access resources, in the field, etc)	5
Preparation for practical activities, homeworks, essays, portfolios, etc.	3
Tutoring	0
Examinations	5
Other activities	0

3.7 Total hours of individual study	36
3.9 Total hours per semester	78
3. 10 Number of ECTS credit points	3

4. Prerequisites (if applicable)

4.1 curricular	Data Structures and Algorithms; Object-Oriented Programming; Microprocessors Architectures; Microcontrollers.
4.2 competence-based	General knowledge of telecommunications systems, algorithms, and programming languages.

5. Requisites (if applicable)

5.1 for running the course	Under PUB undergraduate regulations.
5.2 for running of the applications	Compulsory presence at laboratory classes, according to current PUB regulations.

6. Specific competences

6.1 Professional competences	Selection, installation and operation of fixed and mobile telecommunications equipment and network design to ensure a common telecommunications site.
6.2 Transversal competences	-

7. Course objectives (as implied by the grid of specific competences)

7.1 General objective of the course	Main theoretical and practical developments concerning communications networks and Internet concepts, techniques, and systems. Also, the students develop skills for software development, using different languages, standards, and designing instruments.
7.2 Specific objectives	TCP / IP stack of protocols allows heterogeneous computer systems to communicate via interconnected networks using gateways and routers. This course will describe the Internet architecture, IP addressing, subnets and protocols, transport-level services (UDP, TCP, sockets, ports), applications (client-server, e-mail, remote login (TELNET), file transfer (FTP), Web, network management (SNMP), some security features.

8. Content

8.1 Lectures	Teaching techniques	Remarks
Network architectures	Oral communication methods. If appropriate, a video projector can be used. Course materials are: bibliographic books, lecture notes and presentations, proposed and solved problems slides and other sources. Lecture digital notes will be available on the website (radubadea.comm.pub.ro).	2 hours
Network layer; Internet Protocol v4		4 hours
Routing in packet switched networks		4 hours
Mobile IP		2 hours
Internet Protocol v6		2 hours
Transport layer protocols (TCP/UDP)		4 hours
Directory and naming protocols		2 hours
File-related protocols		2 hours
Voice over Internet Protocol (VoIP)		2 hours
TCP/IP security		4 hours
Bibliography 1) Tanenbaum A. S., *Computer Networks* – Fourth edition, Prentice-Hall International, 2002. 2) James F. Kurose, Keith W. Ross; *COMPUTER NETWORKING A Top-Down Approach*; Pearson/Addison-Wesley 2013 ISBN-13: 978-0-13-285620-1; ISBN-10: 0-13-285620-4 3) Behrouz A. Forouzan; *TCP/IP Protocol Suite*; McGraw-Hill Forouzan Networking Series; McGraw-Hill 2010; ISBN 978-0-07-337604-2		

8.2 Practical applications	Teaching techniques	Remarks
Packet Tracer introduction		2 hours
Comparison of several network topologies using switches and hubs; interfaces configuration; ARP and PING testing	Applicative teaching will be performed through simulation of communication techniques assisted by multimedia aids. The lab curriculum presenting the works will be available on the website (radubadea.comm.pub.ro).	2 hours
Interconnecting networks with switches. Virtual Local Area Networks (VLAN)		2 hours
Interconnecting networks with switches. Spanning Tree Protocol (STP)		4 hours
Interconnecting networks with routers. A general router configuration		2 hours
Interconnecting networks with routers. Router configuration for RIP and OSPF.		2 hours

Bibliography
Tanenbaum A. S., *Computer Networks* – Fourth edition, Prentice-Hall International, 2002.
2) James F. Kurose, Keith W. Ross; *COMPUTER NETWORKING A Top-Down Approach*; Pearson/Addison-Wesley 2013 ISBN-13: 978-0-13-285620-1; ISBN-10: 0-13-285620-4
3) Behrouz A. Forouzan; *TCP/IP Protocol Suite*; McGraw-Hill Forouzan Networking Series; McGraw-Hill 2010; ISBN 978-0-07-337604-2

9. Bridging the course content with the expectations of the epistemic community representatives, professional associations and employers representatives for the domain of the program

The course topics aim to assimilate the basics of concepts, design methods, implementation, and testing of computer networks. Knowledge transmitted ensure the training of computer networks future specialists, being useful to all those who will work in the IT&C companies or academic and research institutions in the field.

10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Weight in the final mark
10.4 Lectures	- knowledge of fundamental theoretical concepts; - theory application to the data transmissions techniques and systems; - differentiated analysis of technical and theoretical methods.	Four evaluation tests with multiple choices, during the semester (announced from the beginning of the semester). Topics cover all the material taught till each test time (each test represents 20% from the final grade)	80%
10.5 Laboratory	- knowledge of fundamental theoretical and practical concepts taught; - ability to apply the theory to solve problems related	Three networks troubleshooting tests (individual test for each student, using the computer) and one written test for the STP subject. All 4 tests are	20%

	to data transmissions techniques. - presence and activity of students through laboratory hours.	announced from the beginning of the semester and include both theoretical and practical aspects (each test represents 5% from the final grade).	

10.6 Minimal performance standard
- The study of real problems occurring in the context of a reduced complexity telecommunication network; - Design, implementation, and functionality demonstration of common solutions applied in the telecommunications networks and Internet.

Date   Lecturer and   Instructor for practical activities

18.09.2017   Lect. PhD Eng. Radu . BADEA   Lect. PhD Eng. Radu . BADEA

Date of department approval   Director of Department,

25.09.2017   Assoc. Prof. PhD Eng. Eduard Popovici

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