ECTS catalog with learning outcomes
University of Montenegro

Faculty of Electrical Engineering / /

Course:				
Course ID	**Course status**	**Semester**	**ECTS credits**	**Lessons** (Lessons+Exercises+Laboratory)
12799	Mandatory	2	5	3+1+1
Programs				
Prerequisites	There are no prerequisites for enrollment, monitoring, and passing of this course.			
Aims	Students familiarize themselves with the basics of computer networks. The most significant concepts of the TCP/IP architecture are studied, starting from the application layer to the network layer. Characteristics of Ethernet, WiFi, 4G, and 5G standards are analyzed.			
Learning outcomes	After passing this exam, the student will be able to: Explain the concepts of computer networks. Describe the principles of the application layer. Explain the characteristics of HTTP, FTP, SMTP, and DNS protocols. Describe the principles of the transport layer. Explain the characteristics of UDP and TCP protocols. Describe TCP flow and congestion control. Describe the principles of the network layer. Explain the characteristics of IP protocol and routing protocols. Describe the principles of the link layer. Explain the characteristics of Ethernet, WiFi, 4G and 5G protocols.			
Lecturer / Teaching assistant	Prof. Igor Radusinovic / Prof. Slavica Tomovic			
Methodology	Lectures, exercises, and labs.			
Plan and program of work				
Preparing week	Preparation and registration of the semester			
I week lectures	Introduction.			
I week exercises				
II week lectures	Application layer concepts. HTTP.			
II week exercises				
III week lectures	FTP. SMTP. DNS			
III week exercises				
IV week lectures	Transport layer basics. No connected transport service (UDP)			
IV week exercises				
V week lectures	Connected transport service (TCP).			
V week exercises				
VI week lectures	TCP congestion control. TCP flow control.			
VI week exercises				
VII week lectures	Midterm exam			
VII week exercises	Midterm exam			
VIII week lectures	Network layer basics.			
VIII week exercises				
IX week lectures	IPv4 i IPv6			
IX week exercises				
X week lectures	Internet routing.			
X week exercises				
XI week lectures	Router			
XI week exercises				
XII week lectures	Data link layer basics.			
XII week exercises				
XIII week lectures	Ethernet. Switch			
XIII week exercises				

XIV week lectures	WLAN. Access Point
XIV week exercises	
XV week lectures	4G. 5G.
XV week exercises	
Student workload	

Per week	**Per semester**
5 credits x 40/30=6 hours and 40 minuts 3 sat(a) theoretical classes 1 sat(a) practical classes 1 excercises **1 hour(s) i 40 minuts** of independent work, including consultations	Classes and final exam: **6 hour(s) i 40 minuts x 16 =106 hour(s) i 40 minuts** Necessary preparation before the beginning of the semester (administration, registration, certification): **6 hour(s) i 40 minuts x 2 =13 hour(s) i 20 minuts** Total workload for the subject: **5 x 30=150 hour(s)** Additional work for exam preparation in the preparing exam period, including taking the remedial exam from 0 to 30 hours (remaining time from the first two items to the total load for the item) **30 hour(s) i 0 minuts** Workload structure: **106 hour(s) i 40 minuts (cources), 13 hour(s) i 20 minuts (preparation), 30 hour(s) i 0 minuts (additional work)**
Student obligations	Students are required to attend classes, complete a seminar paper, and take both a midterm and final exam.
Consultations	Every Monday and Wednesday from 12 to 13.
Literature	J.F. Kurose, K.W. Ross: “ Computer Networking: A Top-Down Approach”, Pearson, 8th edition, 2021.
Examination methods	Seminar paper (30 points), Midterm exam (35 points) and Final exam (35 points).
Special remarks	Lectures and exercises (L+E+Lab) are conducted for a group of up to 40 students.
Comment	

Grade:	F	E	D	C	B	A
Number of points	less than 50 points	greater than or equal to 50 points and less than 60 points	greater than or equal to 60 points and less than 70 points	greater than or equal to 70 points and less than 80 points	greater than or equal to 80 points and less than 90 points	greater than or equal to 90 points