



## SYLLABUS PREDMETA

### General information

Course title:	<b>COMPUTER NETWORKS</b>
ISVU <sup>1</sup> course code:	38258 / MT504
Studies in which the course is taught:	STUDY OF MECHATRONICS
Course Instructor:	Ph.D Adam Stančić, senior lecturer
Course Assistant:	- - -
ECTS credits:	4.0
Semester of the course execution:	5. (winter sem.)
Academic year:	2022 / 2023
Exam prerequisites:	- - -
Lectures are given in a foreign language:	English
Aims:	Introducing students to technologies and concepts in the field of computer networks, characteristics of active and passive network equipment and infrastructure, characteristics and significant protocols of each individual OSI network layer.

### Course

Course structure	Number of contact hours per week:	Number of contact hours per semester:	Student's requirements by type of teaching:
Lectures:	2	30	attendance 80%
Tutorials:	2	30	attendance 80%
Practical (lab) sessions:			
Seminars:			
Field work:			
Other:			
<b>TOTAL:</b>	<b>4</b>	<b>60</b>	

### Monitoring of students' work, knowledge evaluation and learning outcomes

Formation of the grade during the implementation of teaching:  (Define from minimum 5 to maximum 10 learning outcomes)	LEARNING OUTCOMES (upon completion of the course the student should be able to:)	FACTORS AFFECTING THE GRADE (e.g. term paper, practical work, presentation, ...)	MAXIMUM NUMBER OF POINTS PER FACTOR
	<b>I 1:</b> Identify computer networks by basic features	Colloquium I	Colloquium I 40 points  Colloquium II 40 points  Seminar 20 points
	<b>I 2:</b> Explain the function and characteristics of primary network devices and infrastructure	Colloquium I	
	<b>I 3:</b> Illustrate the hierarchical relationship of the stratum of the OSI layer network model	Colloquium I	
	<b>I 4:</b> Compare the characteristics of the OSI network layers	Colloquium II	
	<b>I 5:</b> Formulate terms related to the quality and success of the data transfer process	Colloquium II	
	<b>I 6:</b> Sketch the course of preparation, transmission and presentation of information transmitted within a computer network	Colloquium II	

<sup>1</sup> ISVU – Information System of Higher Education Institutions in Croatia



## SYLLABUS PREDMETA

	<b>I 7:</b> - - -	
	<b>I 8:</b> - - -	
	<b>I 9:</b> - - -	
	<b>I 10:</b> - - -	
Alternative formation of the grade (I 1 – I 10)	<b>or alternative formation of the grade: I 1 – I 10</b>	TOTAL: 100 points
Students' competencies	The student is introduced to the basic concepts in the field of network architecture, technologies, communication protocols and concepts of computer network performance in the work environment. Through the acquired knowledge and conducted exercises, the student should be able to define the network settings of computers or devices in the network. The student will be able to explain the path that information must take from the moment of formation, preparation, sending and receipt on the destination computer side.	

Prerequisites for course approval (lecturer's signature):	
Prerequisites for taking exams:	
Grading scale:	<p>(According to the Regulations on student assessment of Karlovac University of Applied Sciences, Article 9, Paragraph 5)</p> <p>90-100 - excellent (5) (A)  80 to 89.9 - very good (4) (B)  65 to 79.9 - good (3) (C)  60 to 64.9 - sufficient (2) (D)  50 to 59.9 - sufficient (2) (E)  0 to 49.9 – fail (1) (F)</p> <p>Students are graded during class, what forms 70% of final exam. Students who achieve 50% (35 points) and more are allowed to take the final exam. The score on final exam makes 30% of the final grade.</p>

### ECTS structure

ECTS credits allocated to the course reflect the total burden to the student during adoption of the course content. Total contact hours, relative gravity of the content, effort required for exam preparation, as well as, every other possible burden are taken in account:

Attendance (active participation)	Term paper	Composition	Presentation	Continuous assessment and evaluation	Practical work
0,5	1,0				
Independent work	Project	Written exam	Oral exam	Other	
		2,5			

### Review of topics/units per week associated with learning outcomes

Week	Lectures topics/units and learning outcomes:	Tutorials topics/units and learning outcomes:
1.	General information about computer networks, division, significance, standards and historical development <b>I 1</b>	Basic network equipment overview (SOHO) <b>I 1</b>
2.	Means and methods of data transmission, telecommunication systems, network	Data transmission characteristics in wired and wireless network <b>I 1</b>



## SYLLABUS PREDMETA

	components I 1	
3.	Analog and digital signal, their characteristics and occurrence of errors I 1	Media quality testing, the impact of errors on data transmission I 1
4.	Passive network equipment I 2	Network infrastructure O2
5.	Active network equipment I 2	Connecting network equipment via network infrastructure I 2
6.	Layered network model I 3	Connecting computers and routers and connecting to the Internet - home and work environment I 3
7.	Physical and data-link layer I 3	MAC address, settings in switches and routers I 3
8.	Network layer - routing, addressing and fragmentation I 3	Network addressing, network subnets O3
9.	Transport layer - TCP and UDP protocol, ports I 3	TCP port and protocol settings in routers, traffic management I 3
10.	Session, presentation and application layer, relationship of network layers I 3, I 4	Working with a remote computer - Team Viewer, VNC, RDC I 4
11.	Sharing computer and network resources I 4	Access and share devices on the network I 4
12.	Network traffic management and control I 5	Network activity and security monitoring - Network Monitor, Nmap I 5
13.	Quality of network service I 5	Using the Wireshark application I 5
14.	Network simulation, CAN Bus protocol I 6	Simulation and emulation tools - IMUNES, Cisco Packet Tracer I 6
15.	Network communication, ensuring privacy and security I 6	Online data protection - user encryption and authorization I 6

### References

#### REFERENCES (compulsory/additional):

##### Compulsory:

- Andrew S. Tanenbaum: Computer Networks, Fourth Edition, Prentice Hall, New Jersey 2010
- D. Baronica: Umrežavanje računala Znak, Zagreb, 2000
- Unauthorized lecture tracking scripts and presentations (author: Adam Stančić)

##### Additional:

- Johnson: 31 Days Before Your CCNA Exam, Second Edition, Cisco Press, 2009
- On-line data sources related to the presented unit

#### Exams for the academic year: 2022./ 2023.

Exam dates:	According to the schedule of exams for academic year published on the web- site
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### Contact information

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2. Course Instructor/Lecturer:	---
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