COURSE UNIT DESCRIPTION

Course unit title	Code
Computer networks	

Annotation
Evolution of computer networks. Network classification, architectures, structure, standards. OSI model. Hardware and logic local and long distance communication tools and services. Protocols and their sets, TCP / IP. Addressing, routing and roaming. Network security. Internet technologies and services. Network management, domains. Multimedia, mobile and other modern networks. Cloud computing solutions.

Lecturer(s)	Department, Faculty
Coordinating: Doc. Dr. Liudvikas Kaklauskas **Other: dr. Dainius Balbonas**	Siauliai Academy

Study cycle	Type of the course unit
First cycle studies	Compulsory

Mode of delivery	Semester or period when it is delivered	Language of instruction
Face-to-face	3 semester	Lithuanian/English

Requisites	
Prerequisites: computer architecture, procedural programing.	**Co-requisites (if relevant):No**

Number of ECTS credits allocated	Student's workload (total)	Contact hours	Individual work
5	**133**	**56**	**79**

Purpose of the course unit: programme competences to be developed		
To know computer network standards, protocols, hardware and software, to be able to properly apply this knowledge, to know effective network management solutions.		
Learning outcomes of the course unit	**Teaching and learning methods**	**Assessment methods**
Consistently explain the basic facts, concepts, theories, and mathematical methods related to computer operation, computer hardware and software, its features and practical applications, computer communication, and applied solutions related to important historical, current, and potential developments in computer science and future trends.	Formal lecture, Laboratory classes, Library / information retrieval tasks	Examination (Test), Laboratory examination
Apply knowledge of software systems to develop secure IT solutions that meet relevant criteria to solve current professional problems.	Formal lecture, Laboratory classes.	Examination (Test), Laboratory examination

To describe the problem of professional activity in the field of study of program systems at different levels of abstraction.	Formal lecture, Laboratory classes.	Examination (Test), Laboratory examination
Use effective methods analyze the data, information and solutions required to solve the current problem of professional activity of program systems according to various criteria.	Formal lecture, Laboratory classes, remote consultation.	Examination (Test), Laboratory examination
Critically evaluate the data, information, results and solutions developed and obtained during the research with reasoned conclusions and recommendations.	Formal lecture, Laboratory classes, discusion.	Examination (Test), Laboratory examination
Methodologically prepare the specification, design, and other documentation required to design, install, develop, operate, and administer a product or service of software system.	Formal lecture, Laboratory classes.	Examination (Test), Laboratory examination

Course content: breakdown of the topics	**Contact hours**							**Individual work: time and assignments**	
	Lectures	Tutorials	Seminars	Workshops	Laboratory work	Internship/work placement	**Contact hours, total**	**Individual work**	**Assignments**
1. The evolution of computer networks. The concept of network.	2				2		**4**	**5**	Preparation and defense of laboratory works
2. Theoretical network models. OSI model.	2				4		**6**	**8**	
3. Data transmission at the physical level. Requirements for modern networks. Network cables. Communication lines.	2				2		**4**	**5**	
4. Transmission of information at the data level. Network cards. Concentrators. Switching methods. Structure of cabling system.	2				4		**6**	**8**	
5. Bridges. Switches. Protocols and standards. Ethernet. Wireless networks.	2				4		**6**	**8**	
6. Principles of large-scale interconnection. TCP / IP and IP addressing. Optical network equipment.	3				4		**7**	**10**	
7. Routing. Global networks. Cloud computing. Container technology, use of Docker and Kuberneties.	4				2		**6**	**9**	
8. Network operating systems. Cloud computing services using Linux OS, Docker and AWS CLI.	2				2		**4**	**5**	
9. Network Services. Internet services.	2				4		**6**	**10**	
10. Network Security. Network analysis and management.	3				4		**7**	**11**	
Total	**24**	**-**	**-**	**-**	**32**	**-**	**56**	**79**	

Assessment strategy	**Weight %**	**Deadline**	**Assessment criteria**
Defense of laboratory works	50	Time during the semester	The quality and defense of laboratory work reports are evaluated. Evaluations of each laboratory work and its defense are averaged and multiplied by a weighting factor of 5%, for a total of 10 laboratory work

Exam	50	Time during the session	During the exam, the students solves a test of closed and open type Final evaluation. The system of ten grades and gathered evaluation system are being employed. The system of ten grades and gathered evaluation system are being employed. Reporting for laboratory work (50%), exam (50%).

Author	Publishing year	Title	Issue of a periodical or volume of a publication; pages	Publishing house or internet site
Required reading				
J. F. Kurose, K. W. Ross.	2021	Computer networking. A top-down approach. Eight edition		Pearson
Tutorials Point	2020	Cloud Computing Tutorial		https://www.tutorialspoint.com/cloud_computing/cloud_computing_tutorial.pdf
Recommended reading				
Lee Chao		Cloud Computing Networking. Theory, Practice, and Development		http://ittoday.info/Excerpts/Overview-on-Cloud-and-Networking.pdf
Tanenbaum A.S., Wetherall D.J.	2011	Computer networks		Boston: Pearson
Editor(s): Hossein Bidgoli	2008	Handbook of Computer Networks: Distributed Networks, Network Planning, Control, Management, and New Trends and Applications, Volume 3		https://onlinelibrary.wiley.com/doi/pdf/10.1002/9781118256107
Crouthamel Andrew	2018	*Mastering Wireshark 2*.		Packt Publishing, Limited. Electronic version in library with ProQuest user