Study program	Level of studies		**First cycle**	
	Study program name		**Physics and Informatics Education**	
Course name	**COMPUTER NETWORKS**			
Course ID	Semester	Course status	ECTS credits	L+E
CS250	**IV**	**MANDATORY**	**6**	**2+2**
Lecturer				
Aims and intended learning outcomes	The module aims to introduce students to the basic concepts of data transmission, computer communications, and both local and wide-area computer networks. Additionally, it focuses on mastering fundamental computer networking techniques. Upon completing the module, students will be able to: - Understand the basic concepts of computer communications and data transmission. - Grasp the structure and topologies of local and wide-area computer networks. - Comprehend network protocols and the ISO/OSI reference model. - Understand basic network and telecommunication equipment. - Work independently with network operating systems. - Independently configure simple computer networks.			

Course content

- Data transmission; Serial and parallel transmission; Synchronous and asynchronous transmission; Modulation and demodulation; Modems; Communication networks; Network architecture; Switching; Multiplexing.
- Local and wide-area computer networks; Topologies of local computer networks; Communication in local computer networks.
- Structure of global computer networks; Network protocols; TCP/IP protocol and IP addresses; Network services.
- ISO–OSI reference model; Concept of services and protocols; Functionality of layers; Layer interactions and service primitives.
- Physical layer; Communication media; Attenuation and distortion; Signal propagation; Synchronization problems.
- Data link layer; Error control; Selective repeat protocol; Go Back N protocol; HDLC protocol.
- Network layer; Topology and network metrics; Routing table; Routing algorithms.
- Transport layer; Layer functionality; TCP/IP protocol.
- Session layer; Presentation layer; Application layer.
- Standard network and telecommunication equipment; Configuring computer networks.
- Internet structure; Internet protocols; Internet services.
- Network operating systems; Configuring network servers.
- Overview of advanced computer network technologies.

Student workload (hours)		Grading	
Lectures and Exercises	60	Assessment method	Points
Exam preparation	90	Practicals	20
		Midterm exam	40
Total	150	Final exam	40
		Ukupno	100

Literature

[1] A. Tanenbaum: “Computer Networks (5th edition)”, Prentice Hall, 2010.
[2] D. E. Comer, R. E. Droms, Computer Networks and Internets, 4th edition, Prentice Hall, 2003.
[3] William Stallings, Data & Computer Communications; (10th edition)”, 2013
[4] Halsall, F., Data Communications, Computer networks and OSI. Addison-Wesley, 1988

Remarks