

Study programmes: PhD studies - Informatics				
Course name: R430 - Computer networks - advanced concepts				
Lecturers: Vladimir Filipović, Miroslav Marić and other lecturers at Department of Computer science				
Status: Optional				
ECTS: 9				
Attendance prerequisites: There are no prerequisites				
Course aims: Acquisition of general and specific knowledge about computer networks theory and principles, modern solutions and state-of-the-art research in this area.				
Course outcome: After completing the course, the student has an advanced knowledge about computer network's hardware, software, layered organization, implementation, functionalities and maintenance. The student fully understands all layers of computer network and works on open problems in this area.				
Course content: - Theoretical foundations of data transmission, wired communication media, wireless communication media, communication satellites, telephone networks, mobile networks, cable television networks. - Data link layer, detection and correction of errors, data link protocols, sliding window protocols, protocol verification, protocol examples. - Communication media allocation, multiple access medium protocols, Ethernet, wireless local networks, wireless broadband networks, Bluetooth, switching. - Internet layer, routing algorithms, congestion control, quality of service, connecting heterogenous networks. - Transport layer, protocols, transport protocols on Internet, performances. - Application layer, domain name system, symmetric key encryption, public key cryptography. - Digital signatures, certificates, network security, authentication protocols, email security, security on Web, social implication.				
Literature: Andrew S. Tanenbaum, David J. Wetherall, Computer networks, 5th edition, Pearson. (teacher can some select other adequate books)				
Number of hours: 10	Lectures: 4	Tutorials: -	Laboratory: -	Research: 6
Teaching and learning methods: Frontal, group, individual and practical.				
Assessment (maximal 100 points)				
Course assignments	points	Final exam		points
Lectures	-	Written exam		60
Exercises / Tutorials	-	Oral exam		-
Colloquia	40	Written-oral exam		-
Essay / Project	-			