

Study program: Information Technology			
Course title: Cloud Computing			
Teacher(s): Marjan D. Milošević, Žarko D. Bogićević			
Course status: Elective			
Number of ECTS credits: 6			
Condition: Computer networks and communications, Operating systems, Object-oriented programming			
Course objectives Introduction to possibilities of cloud computing and advantages/disadvantages comparing with traditional approach in use of services and infrastructure. Getting to know basics of virtualisation and containers. Understanding of models: “Software as a service”, “Platform as a service”, “Infrastructure as a service” and “Function as a service”. Becoming familiar with popular cloud systems: MS Azure, Amazon AWS, Google Cloud, OpenStack. Training for development of software running in the cloud.			
Learning outcomes Student is able to analyse different cloud solutions and choose appropriate platform according to specifications for performance and scalability. Student describes virtualisation concepts, students installs applications using popular cloud solutions (Amazon Web Services, Azure, AppEngine). Student can choose suitable service in the cloud according to requirements. Student is able to develop applications aimed for cloud execution (in preferred language: C#, Java, Python).			
Summary of topics <i>Theoretical classes</i> Distributed systems fundamentals. Preview of web-protocols. Virtualisation: hypervisors, paravirtualization, solution examples – Xen, VMWare, Vagrant. Distributed file-systems, distributed programming. Data processing in the cloud. Cloud networking. Analysis of profitability of the cloud solutions. <i>Practical teaching</i> Configuration of the virtualisation platforms. Use of the complete cloud solutions. Design of own cloud platforms based on open source solutions. Application development and deployment in the cloud. Design of own architecture in the cloud according to the project needs. Cloud security management. Cloud accounts and permissions administration.			
Recommended literature [1] M. Wittig, A.Wittig: Amazon veb servisi u akciji, Kompjuter biblioteka, Beograd, 2018, ISBN: 978-86-7310-535-2 [2] M. J. Kavis: Architecting the Cloud: Design Decisions for Cloud Computing Service Models, Wiley, New Jersey, 2014, ISBN: 978-1-118-61761-8 [3] T.Erl, E.B.Monroy, Cloud Computing: Concepts, Technology, and Architecture, Second Edition, Pearson 2023, ISBN-13: 9780138052256 [4] W. J. Chun: Python:programiranje aplikacija, prevod 3. izdanja, Mikroknjiga, Beograd, 2014, ISBN: 978-86-7555-398-4 [5] K. Spilker: Microsoft Azure Essentials: Fundamentals of Azure, Second Edition, Microsoft Press 2016, ISBN: 978-1-5093-0296-3 [6] N. Bačanin Džakula, I. Šturmberger, Klaud računarstvo, Univerzitet Singidunum, Beograd, 2021, ISBN: 978-86-7912-772-3 https://singipedia.singidunum.ac.rs/izdanje/43808-klaud-racunarstvo			
Number of active classes: 5		Theoretical classes: 2	Practical teaching: 3
Teaching methods Popular lecture, discussion lecture, case study, heuristic conversation. Practical tasks. Explorative, problem-based and ICT methods via project building. Practical work in the environment for the cloud service management.			
Evaluation (maximum number of points 100)			
Exam prerequisites:		No. of points:	Final exam:
Activities during teaching process			No. of points:
Practical teaching		10	Final exam (written): 20
Colloquium		30	Final exam (oral): 40
Practical teaching			