Basic data of the subject	
Academic unit:	**Faculty of Engineering and Informatics** **Applied Informatics**
Title of the subject:	**Cloud Computing**
Level:	**Bachelor**
Course Status:	**Obligatory**
Year of studies:	**III**
Number of hours per week:	**3**
Value of Credits - ECTS:	**5**
Time / location:	
Course lecturer:	**Prof.Ass.Dr.Dhuratë Hyseni**
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Course Description:	*This class gives the students the basics of virtualization and cloud computing technologies. The main platforms of virtualization such as Vmware vCenter, Citrix Xen, Microsoft Hyper-V are discussed and students practically find out how to install and administer these platforms. By using the cloud computing paradigms such as IaaS, PaaS and SaaS, students acquire knowledge and practical skills of creating programming products. The students are acquainted with the software architecture SOA, which is oriented towards services. During the class the students nurture their practical skills by carrying-out practical work and creating their own project based on cloud computing. Problematic cases when already existent programs are transferred onto the cloud, cases of utilization and best examples are discussed.*
Objectives of the course:	*The purpose is to teach the students how to install, administer and maintain the technologies of virtualization and to create programming products, which are based on the IaaS, PaaS and SaaS paradigms of cloud computing.*
Expected learning outcomes:	*Upon successful completion of this course, student will be able to:* • *Understand standards and protocols used in Cloud Computing and Virtualization.* • *Select and adopt appropriate algorithms developing Cloud Computing software products.* • *List main application domains of Cloud Computing products.* • *Explain concept of Cloud Computing and virtualization.* • *List advantages and disadvantages, limitations of Cloud Computing and virtualization.* • *Use acquired knowledge students developing not complex but standard cloud computing IaaS, PaaS, SaaS products.*

	• *Install and administrates VMware vCenter virtualization management platform.* • *Install Citrix Xen High Availability virtualized data center services.*		

Contribution to the student load (which must correspond with learning outcomes)			
Activity	**Hour**	**Day/Week**	**In total**
Lectures with numerical exercises	3	15	45
Internship			
Contacts with teacher / consultations			
Field exercises			
Midterm, seminars and projects.	3	2	6
Homework			
Self-learning time student (at the library or at home)	3	15	45
Final preparation for the exam	7	2	14
Time spent on evaluation (tests, quiz and final exam)			
Projects and presentations.	3	5	15
Total			**125**

Teaching methodology:	*The course takes 15 weeks with 2 hours of lectures and 2 hours weekly individual and group exercises.* *Exercises will be held in the form of individual and group work in which concrete examples will be discussed.* *Active participation is extremely important so students are encouraged to attend lectures and exercises regularly and contribute to the discussions that take place in lectures. Lectures, exercise, individual work, discussions and group work.*
Assessment methods:	*Test 1, Test 2, Attendance and Activity.* *Final exam: 100%*
The ratio of theory and practice:	*70% theory and 30% practice.*
Literature	
Basic Literature:	1. *T. Erl, et al. (2015) Cloud Computing Design Patterns. Prentice Hall, 592 p.*
Additional Literature:	2. *M. J. Kavis (2014) Architecting the Cloud: Design Decisions for Cloud Computing Service Models (SaaS, PaaS, and IaaS). Wiley, 224 p.*
Designed learning plan	
Week:	**Lectures and exercises to be held**
Week one:	*Introduction*
Week two:	*Conception of cloud computing.*
Week three:	*Basics of cloud computing.*

Week four:	*Virtualization and data storage networks.*
Week five:	*Hardware and software solutions of virtualization.*
Week six:	*Types of services of cloud computing – SaaS, IaaS, PaaS, Software as a service SaaS.*
Week seven:	*Test 1*
Week eight:	*Platform as a service PaaS.*
Week nine:	*Platform as a service PaaS (continued).*
Week ten:	*Infrastructure as a service IaaS.*
Week eleven:	*Service oriented architecture SOA.*
Week twelve:	*Analysis of business requirements and problems.*
Week thirteen:	*Desktop virtualization infrastructure technologies VDI,*
Week fourteen:	*Safety and privacy aspects of cloud computing services.*
Week fifteen:	*Test 2*

Academic policies and rules of conduct

Regular attendance of lectures and exercises is necessary, as well as active participation with discussion and solution of tasks. Not impeding the progress required for learning using mobile phones turned off or in silent mode.