

Basic data of the subject	
Academic unit:	Faculty of Engineering and Informatics Applied Informatics
Title of the subject:	Internet of Things Application
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.Fakije Zejnullahu
Contact details:	Fakije.zejnullahu@ushaf.net
Course Description:	<i>This course provides students with basics of internet of things. It analyses characteristics and definitions, hardware for implementation of internet of things. Students acquires knowledge and practical skills designing, programming, installing and maintaining specific internet of things domains including home automation, smart city, business and industry systems. It is analysed wearable devices and its programming platforms. During the course students develops their practical skills by performing practical tasks and developing their internet of things technologies and frameworks (JSON, XML, HTTPlib, URLLib, Xively Cloud, Python Django, RESTful Web API) based project. It is addressed data safety and privacy problems, best and worst practices.</i>
Objectives of the course:	<i>To teach students to develop products based on internet of things technologies according to customer and platform technical requirements.</i>
Expected learning outcomes:	<p><i>Upon successful completion of this course, student will be able to:</i></p> <ul style="list-style-type: none"> <i>• Understand devices, data exchange protocols and standards used in internet of things.</i> <i>• Choose and customize appropriate algorithms for special internet of things products.</i> <i>• Lists main application domains of internet of things products.</i> <i>• Explain main disadvantages of internet of things technologies.</i> <i>• List standards, protocols and frameworks used for internet of things products development.</i> <i>• Design special internet of things based software and hardware products according to specified requirements and limitations.</i> <i>• Use the acquired knowledge develops not complex but</i>

	<p><i>standard software components.</i></p> <ul style="list-style-type: none"> • <i>Develop non-complex JSON, XML, HTTPlib, URLLib, Xively Cloud, Python Django, RESTful Web API software components.</i> • <i>Install and administrates developed products in special servers.</i> 		
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:	<p><i>The course takes 15 weeks with 2 hours of lectures and 2 hours weekly individual and group exercises.</i></p> <p><i>Exercises will be held in the form of individual and group work in which concrete examples will be discussed.</i></p> <p><i>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.</i></p> <p><i>Lectures, exercise, individual work, discussions and group work.</i></p>		
Assessment methods:	<p><i>Test 1, Test 2, Attendance and Activity.</i></p> <p><i>Final exam: 100%</i></p>		
The ratio of theory and practice:	<p><i>70% theory with exercises and 30% laboratory work.</i></p>		
Literature			
Basic Literature:	<ol style="list-style-type: none"> 1. A Bahga, V Madiseti (2014) <i>Internet of Things: A Hands-On Approach</i>. Vijay Madiseti, 446 p. 2. R. Buyya, A. Dastjerdi (2016) <i>Internet of Things: Principles and Paradigms</i>. Morgan Kaufmann, 378 p. 		
Additional Literature:	<ol style="list-style-type: none"> 1. A. McEwen, H. Cassimally (2013) <i>Designing the Internet of Things</i>. Wiley, 336 p. 		
Designed learning plan			
Week:	Lectures and exercises to be held		

Week one:	<i>Introduction</i>
Week two:	<i>Conception of internet of things.</i>
Week three:	<i>Internet of things for specific domains.</i>
Week four:	<i>Internet of things and M2M (machine to machine) communication.</i>
Week five:	<i>Software development methodology for Internet of things.</i>
Week six:	<i>Internet of things systems development using Python.</i>
Week seven:	<i>Test 1</i>
Week eight:	<i>Hardware devices for Internet of things.</i>
Week nine:	<i>Servers for Internet of things platforms.</i>
Week ten:	<i>Programming frameworks for Internet of things.</i>
Week eleven:	<i>Programming frameworks for Internet of things (continued).</i>
Week twelve:	<i>Data safety and privacy in Internet of things.</i>
Week thirteen:	<i>Wearable devices and technologies.</i>
Week fourteen:	<i>Use cases of Internet of things.</i>
Week fifteen:	<i>Test 2</i>
Academic policies and rules of conduct	
<i>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.</i>	