UNIVERSITY OF PRIZREN "UKSHIN HOTI"
FACULTY OF COMPUTER SCIENCES

INFORMATION TECHNOLOGIES AND TELECOMMUNICATION (ITT)

SYLLABUS

Level of studies		Bachelor	***Program***	ITT	***Academic year***	2018/2019			
Course		Computer Architecture and Operating Systems							
Year	I	***Course status***	Mandatory	***Code***		***ECTS (credits)***	6		
Semester	II								
Teaching weeks		15	***Teching hours***	60	***Lectures***	***Exercises***			
					2	2			
Teaching methodology		Lectures, exercises, seminar papers, midterms, final exam and consultations							
Consultation		One hour/week							
Proffesor		**Prof. Asoc. Dr. Samedin Krrabaj**	***E-mail:***	**samedin.krrabaj@uni-prizren.com**					
			Tel.:	/					
Teaching Assistant		**Ass. Arbër Beshiri, Ph. D. C**	***E-mail:***	**arber.beshiri@uni-prizren.com**					
			Tel.:	/					

Study goal and table of content	**Benefits of students**
The purpose of this course is to study deeply the basics and developments in the field of computer architecture and operating systems. While special emphasis lies on basic knowledge in the implementation of the von Neumann computer architecture. Here we will study advanced techniques such as parallelism at the instruction level or threads, pipelining, dynamic scheduling used in modern processors, in order to achieve high performance. Particular attention will be given to the design of fast processors, rapid memory, multiprocessors, and differences in architectural features.	The course has the main objectives of providing knowledge on architecture and the organization of computers. Then, providing general and applied knowledge on the development of information technology and computers in general, with the aim of implementing the acquired knowledge. The course purposes: • Students to encourage and work in a group and equipped with knowledge and general skills on developing core techniques around high performance computers. • Students to get knowledge in the field of architecture and organization of computers and operating systems.

Methodology for the implementation of educational topics:		
The course is a combination of lectures, discussions, numerical and laboratory exercises, while the assignments are presented by the laboratory course teachers!		
Conditions for implementation of educational topics:		
Adequate literature, tables, computers, projectors and other IT tools for lectures and exercises.		
Assesing ways of the students (in %):	**Evaluation (in %):**	**Grading**
Attendance in lectures and exercises	5% + 5%	Under 51 % 5 51% - 60% 6 61% - 70% 7 71% - 80 % 8 81% - 90% 9 91% - 100% 10
Project/Seminar paper	20%	
Midterm 1	35%	
Midterm 2	35%	
Or final exam:	100%	
Total:	100%	

Obligations of student:	
Lectures	**Exercises**
The student should be regular in lectures and exercises, to use all opportunities to gain knowledge, to use mandatory and wider literature, to be active and respect the rules on higher education, ethics in courtesy and cooperation.	The student should be active in the exercises and reflect the readiness and knowledge of initiatives, ideas and demonstrations of the knowledge acquired in the lectures.

Student load for the course			
Activities	**Hour/ weeks**	**Days/weeks**	**Total**
Lectures	2	15	30
Laboratory exercises	2	15	30
Contacts with professors /consultations	1	5	5
Practical work	1	2	2
Projects, presentations, etc.	1	2	2
Own study time	3	15	45
Preparation for final exam	5	6	30
Time spent in the assessment (midterms, final exam, etc.)	2	3	6
Notice: 1 ECTS credits= 25 hour commitment, e.g. if the subject has 6 ECTS credits student must have 150 hours during the semester		**Total load:**	**150**

Week	**Lectures**	**Hours**	**Exercises**	**Hours**
	Topic		**Topic**	
1	• Introduction to course organization – syllabus (about lectures) • Introduction to computer architecture	2	• Introduction to course organization – syllabus (about exercises) • Knowledge of computer parts	2
2	• Computer Evolution and Performance	2	• The process of formatting and installing of the operating system	2
3	• A Top-Level View of Computer Function and Interconnection	2	• Numerical/laboratory exercises about the top-level view of computer function and interconnection	2
4	• Cache Memory	2	• Numerical/laboratory exercises about the cache memory	2
5	• Internal Memory	2	• Numerical/laboratory exercises about the internal memory	2
6	• External Memory	2	• Numerical/laboratory exercises about the external memory • Laboratory exercises about basic commands of Linux	2
7	• Input/ Output Computer Modules	2	• Laboratory exercises about input/output computer modules • Developing and testing programs in Shell Script - Linux	2
8	• Midterm 1	2	• Consultations about midterm 1	2
9	• Operating System Support	2	• Operating systems security	2

10	• Computer Arithmetic	2	• Laboratory exercises about computer arithmetic and assembler	2
11	• Instruction Sets: Characteristics and Functions • Instruction Sets: Addressing Modes and Formats	2	• Instruction Sets: Characteristics and Functions • Instruction Sets: Addressing Modes and Formats • Developing and testing programs in Shell Script - Linux	2
12	• Processor Structure and Function • Instruction-Level Parallelism and Superscalar Processors	2	• Processor Structure and Function • Instruction-Level Parallelism and Superscalar Processors • Developing and testing programs in Shell Script - Linux	2
13	• Parallel Processing • Multicore Computers	2	• Parallel Processing • Multicore Computers • Developing and testing programs in Shell Script - Linux	2
14	• Control Unit Operation • Microprogrammed Control	2	• Control Unit Operation • Microprogrammed Control • Developing and testing programs in Shell Script - Linux	2
15	• Midterm 2	2	• Consultation about midterm 2	2

LITERATURE:

Essential literature:

1. William Stallings. Computer Organization and Architecture. Designing for Performance, 9th Edition, Pearson, 2013.
2. Andrew Tanenbaum and Herbert Bos. Modern Operating Systems, 4th Edition, Pearson, 2015.
3. Daniel Ellard. MIPS Assembly Language Programming, 1994.
4. Nderim Zeqiri, Sistemet Operative & Shell Script Linux: Ushtrime, Arbëria Design, Tetovë, 2012

Additional literature:

1. David Patterson and John Hennessy. Computer Organization and Design. The Hardware/Software Interface, 5th Edition, Elsevier, 2014.
2. Agim Çami. Arkitektura e Kompjuterëve, Tiranë, 2011.
3. Betim Çiço. Arkitektura e Kompjuterëve, Tiranë, 2010.

NOTICE:

- Generally lecture presentations will be made through MS PowerPoint, tables, material usage, computer programs and numeric exercises.
- Additional resources (scientific papers, publications, national bulletins, as well as recent discoveries and research) will be provided by professors.
- In the absence of the opportunity for practical work to be organized weekly, in cooperation with the management of the university, this activity will be organized on certain days in: organizations, companies, etc.
- During each session will be organized the conversation and co-participation with the students!

NOTICE FOR THE STUDENTS:

- Students are required to be regular in lectures and exercises!
- It will be evaluated when the students collaborate and participate in the lectures and course exercises!
- Timely arrival in lectures and exercises is mandatory!