UNIVERSITY OF PRIZREN
FACULTY OF COMPUTER SCIENCE

PROGRAM: Information and Telecommunication Technology

Curriculum - – SYLLABUS							
Level of studies	Master	***Program***		***Academic year***	2018/2019		
SUBJECT	**Selected Algorithms**						
Year	**2019**	***Status Of the subject***	Elective	***Code***		***ECTS credits***	6
Semester	II						
Teaching weeks	15	***Hours teaching***	60	***Lectures***	***Exercises***		
				15	15		
Teaching Methodology	Lectures, exercises, seminar papers, consultations, tests, case studies, assignments, etc.						
Consultation	One hour before and one hour after lectures						
The teacher	Assoc. Prof. Dr. Mentor Hamiti	***E-mail:***	mentor.hamiti@uni-prizren.com				
		Tel.:	049 453 092				
Assistant		***E-mail:***					
		Tel.:					

Study goal and table of content	**Benefits of student**
The course provides students with advanced knowledge about the concepts of selected algorithms, definitions and best practices of advanced data structures, as well as their implementation in high-level programming languages according to student preferences.	After successful completion of the course, students will be able to: - Use high-level programming languages according to student preferences to implement elementary as well as advanced data structures (lists, linked lists, stacks, queues, hash tables, trees and graphs) in different real life situations. - Calculate time and space copmlexity of different algorithms

Methodology for the implementation of educational topics:

In class hours, lecture materials will be discussed and discussed about the issues raised. In exercises, different case scenarios will be processed from the life cycle of the projects. Each student will make a presentation of achieving an example, a real project in the field of Language Technology.

Ways of assessing of the student (in %) :	**Evaluation in%**	**Final grade**
• Regular attendance and participation	0	(91-100) - 10 (81-90) - 9 (71-80) - 8 (61-70) - 7 (51-60) - 6 (0 – 50) - 5
• Projects	30	
• Midterm	35	
• Final Exam	35	
Total	**100.00 %**	

Obligations of student:

Lectures	**Exercises**
• Participation in lectures • Active participation in discussions during lectures • Participation in tasks and projects	• Participation in exercises • Group work in case studies and assignments. • Participation in discussion on case studies

Activities	Hour/ weeks	Days/Weeks	
Lectures	2	15	30
Laboratory exercises	2	15	30
Contacts with teachers / consultations	1	10	10
Practical work	1	10	10
Projects, presentations, etc.	1	10	10
Own study time	1	10	10
Preparation for final exam	5	5	25
Time spent in the assessment (tests, final exam, etc.)	1	15	15
Notice: 1 ECTS credits= 25-hour commitment, e.g. if the subject has 6 ECTS credits student must have 150 hours during the semester commitment.		**Total load:**	**140**

Week	Lectures	Hour	Exercises	
	Topic		Topic	
1	Introduction and Course Overview (Ch. 3.1-3.2 – Cormen)	2	Algorithms fundamental concepts	2
2	Graf algoritmet (Kap. 22.1-22.3, 23.1 – Cormen)	2	Exercise related to topic	2
3	Minimum spanning trees (Kap. 23.2 – Cormen)	2	Exercise related to topic	2
4	Shortest paths (Kap. 24.1-24.3 – Cormen)	2	Exercise related to topic	2
5	Kruskal's Algorithm (Kap. 21.1-21.3, 23.2 – Cormen)	2	Exercise related to topic	2
6	Amortized analysis (Kap. 17.1 – 17.4 – Cormen)	2	Exercise related to topic	2
7	Dynamic Programming (Kap. 15.1-15.3 – Cormen)		Exercise related to topic	2
8	Midterm		Consultations about Midterm	2
9	Dynamic Programming (Kap. 15.4 – Cormen)		Exercise related to topic	2
10	Greedy algorithms (Kap. 16.1-16.2 – Cormen)		Exercise related to topic	2
11	NP-Completeness (Kap. 34.1-34.2 – Cormen)		Exercise related to topic	2
12	NP-Completeness (Kap. 34.1-34.2 – Cormen)		Exercise related to topic	2
13	NP-Plotësia: reductions (Kap. 34.3-34.4 – Cormen)		Exercise related to topic	2
14	Final Exam		Consultations about Final Exam	2

LITERATURE:

Main readings - Basic Text:

1. Thomas Cormen, Charles Leiserson, Ronald Rivest, and Clifford Stein. Introduction to Algorithms (3rd Edition), MIT Press, 2009.
2. Lab Manual – Algorithm Analysis and Design Lab

Supplementary Materials:

1. Edward A. Bender and S. Gill Williamson, Foundations of Combinatorics with Applications.
2. Sanjoy Dasgupta, Christos Papadimitriou, and Umesh Vazirani. Algorithms (1st Edition), McGraw-Hill, 2006.
3. Jon Kleinberg and Éva Tardos. Algorithm Design (1st Edition), Addison Wesley, 2005.
4. Rajeev Motwani and Prabhakar Raghavan. Randomized Algorithms (1st Edition), Cambridge University Press, 1995.
5. Vijay Vazirani. Approximation Algorithms, Springer, 2010.
6. Kenneth Rosen, Discrete Mathematics and its Applications (6th Edition).

NOTICE:

- In general, lecture presentations will be made through the PowerPoint system, table, use of materials, computer programs and the internet.
- As well, by the professor and the assistant will be provided and other additional materials (scientific papers, publications, national bulletins and discoveries and recent research).
- During each session, a conversation approach and co-participation with students will be organized.

Notice for the student:

- Students are required to be regular in the lectures and exercises section.
- The student's contribution in the form of conversation and co-participation with the students will be evaluated.