



**UNIVERSITY OF PRIZREN
FACULTY OF COMPUTER SCIENCE**

PROGRAM:

Curriculum - – SYLLABUS							
<i>Level of studies</i>		BACHELOR	<i>Program</i>	ICT BOS	<i>Academic year</i>	2019/2020	
<i>SUBJECT</i>		THE CONCEPT OF MOBILE TECHNOLOGY					
<i>Year</i>	III	<i>Status Of the subject</i>	Obligatory	<i>Code</i>		<i>ECTS credits</i>	6
<i>Semester</i>	VI						
<i>Teaching weeks</i>		15		<i>Hours teaching</i>		<i>Lectures</i>	<i>Exercises</i>
						2	2
<i>Teaching Methodology</i>		Lectures, exercises, consultations, tests, case studies					
<i>Consultation</i>		One hour before and one hour after the lecture					
<i>The teacher</i>		Prof. Asoc. Emruš Azizović		<i>E-mail:</i>	azizovic.emrus@gmail.com		
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Study goal and table of content	Benefits of student
<p>The main objective of the course is to provide comprehensive and up-to-date knowledge in the field of mobile communications. The emphasis is on the structure and function of the complete system. A detailed study of subsystems of which the total system consists.</p> <p>Students acquire theoretical and practical knowledge from Mobile Communications - technological and radio basics, systems, networks and services, necessary for fast and effective inclusion in the working and technological processes of subjects in the Sector (tele) communication.</p> <p>Introduction to students with basic concepts related to mobile communications.</p>	<ul style="list-style-type: none"> - Technical knowledge about different aspects of the system that will help in understanding the functioning of the system. - This will further assist in providing the required expertise required by the industry. - Understand and use modern communication tools. - Advanced use of communication tools and software. - Practical application of modern communication tools.

Methodology for the implementation of educational topics:		
Lectures consist of classical teaching methods using projector and interaction with students, a student can take a presentation after each lecture from a Web site: www.aemdl.com/ICT/Mobilne komunikacije		
Conditions for realization of educational topics:		
Projector, Computer Laboratory.		
Ways of assessing of the student (in %) :	Evaluation in%	Final grade
Presence on lectures	0-5%	percent grade
Activity	0-5%	91-100% 10 (ten)

Term paper	0-10 %	81-90%	9 (nine)
Test I	0-10 %	71-80%	8 (eight)
Test II	0-10%	61-70%	7 (seven)
Final exam	0-50%	51-60%	6 (six)
Participation in exercises	0-5%	0-50%	5 (five)
Group work on tasks and case studies	0-5%		
Total	100.00 %		

Obligations of student:	
Lectures	Exercises
<ul style="list-style-type: none"> - Regularity in lectures - Active participation in discussions during lectures - Seminary work - Participation in the test - Final exam 	<ul style="list-style-type: none"> - Active participation in exercises - Group work in case studies and tasks - Participation in case studies discussions - Active participation in exercises - Group work in case studies and tasks - Participation in case studies discussions

Activities	Hour/ weeks	Days/Weeks	
Lectures	2	15	30
Laboratory exercises	2	15	30
Contacts with teachers / 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 (tests, final exam, etc.)	2	3	6
Colloquium and seminar	2	15	30

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.

Week	Lectures	Hour	Exercises	
	Topic		Topic	
1	<ul style="list-style-type: none"> • Presentation of the syllabus <ul style="list-style-type: none"> • Introduction • Plan and program. 	2	<ul style="list-style-type: none"> • Evolution of mobile communications networks 	2
2	<ul style="list-style-type: none"> • Basics of Mobile Communications (MK) 	2	<ul style="list-style-type: none"> • Frequency band 	2
3	<ul style="list-style-type: none"> • The technological basis of cellular MK <ul style="list-style-type: none"> • Reuse of frequencies. • Geographical structure of the cellular system. • Cell cellular cellular system. • Mobility Factors. • Increasing capacity. 	2	<ul style="list-style-type: none"> • FDMA, TDMA i CDMA 	2
4	<ul style="list-style-type: none"> • Radio base of MK. <ul style="list-style-type: none"> • Propagation of radio waves. • Problems in radio transmission - attenuation, fading, time dispersion, time alignment 	2	<ul style="list-style-type: none"> • RSS - Radio Subsystem 	2

5	<ul style="list-style-type: none"> • Signal processing in MK. <ul style="list-style-type: none"> • Speech coding. Channel coding. Interleaving. • Multiplexing and modulation in MKs. • Radio channels. 	2	<ul style="list-style-type: none"> • NSS - Switching subsystem 	2
6	<ul style="list-style-type: none"> • Mobile communication systems. <ul style="list-style-type: none"> • Structure, • functionality 	2	<ul style="list-style-type: none"> • OMS - Operation Management Subsystem. 	2
7	<ul style="list-style-type: none"> • Characteristics and dr. terrestrial systems <ul style="list-style-type: none"> • Architecture, characteristics and uses of other cellular systems of type • 1G, 2G, 2,5G and • 3G. 4G. 5G 	2	<ul style="list-style-type: none"> • Antenna techniques 	2
8	Test 1	2	<ul style="list-style-type: none"> • MISO, SISO i MIMO 	2
9	<ul style="list-style-type: none"> • Satellite systems of MK. <ul style="list-style-type: none"> • Orbital aspect. • Telecommunications aspect. • Systems on GEO orbits. • Systems on LEO orbits. • Satellite system services. 	2	<ul style="list-style-type: none"> • Application of MIMO technique 	2
10	<ul style="list-style-type: none"> • Mobile communications networks and services. Network organization. <ul style="list-style-type: none"> • Planning, establishing, operating and maintaining the network. 	2	<ul style="list-style-type: none"> • Standardization of LTE 	2
11	<ul style="list-style-type: none"> • Network Management. <ul style="list-style-type: none"> • Mobile Network • Services and Billing Systems. 	2	<ul style="list-style-type: none"> • OFDM 	2
12	<ul style="list-style-type: none"> • Networks and services of MK. <ul style="list-style-type: none"> • Examples of GSM, TETRA and DECT networks. 	2	<ul style="list-style-type: none"> • Advantages and disadvantages of OFDM 	2
13	<ul style="list-style-type: none"> • Connecting terrestrial and satellite MK. <ul style="list-style-type: none"> • General aspects of connection. • Connecting terrestrial 2G and 2.5G systems with satellite systems. • Satellite and terrestrial 3G systems. 	2	<ul style="list-style-type: none"> • OFDMA 	2
14	<ul style="list-style-type: none"> • Trends in mobile communications. <ul style="list-style-type: none"> • Trends in systems and networks (terrestrial and satellite and their connection) • Trends in services (new types of services, service platforms, new business models, etc.). 	2	<ul style="list-style-type: none"> • E-UTRAN 	2
15	Test 2	2	<ul style="list-style-type: none"> • Radio Channels 	2

LITERATURE:

Basic Literature:

1. Notes and slides from lectures (to be downloaded at www.aemdl.com);
2. N. Bilić: Mobilne radio komunikacije, skripta, ETF Sarajevo, 1999
3. B. Tadić: Mobilne komunikacije, ETF Beograd, 2001

Additional Literature :

4. T. Rappaport: « Wireless communications », N. York, 1996
5. W. Lee: "Mobile Cellular Telecommunications Systems", Mc Graw – Hill, N. York, 1989

NOTICE:

For each subject, students will be equipped with the necessary materials in Bosnian. At the end of each lesson, certain groups of students will deal with the assignment or case studies on the subject of the lecture. The results obtained from this task should be presented and discussed by the student group at the time of the exercise.

Notice for the student:

First of all, the student must be aware of and respect the school's institution and rules; Must observe the schedule of lectures, exercises and term papers, be attentive to the lesson; The possession and presentation of the test and examination index is obligatory; During the preparation of midterm papers, the student must adhere to the instructions given by the teacher for conducting the research and technical work; Tests and exams are assessed individually for each student. Therefore, students should focus only on personal knowledge. The eventual violation of these ethical principles (rules) is punished according to the norms provided by law.