



COURSE: Wireless Communication Networks Planning		
DEGREE: Bachelor's Degree in Communication System Engineering	YEAR: 4	TERM: 1

WEEKLY PROGRAMMING									
Week	Session	DESCRIPTION	GROUPS (Put X)		Special room for session	Session with 2 tea- chers	WEEKLY PROGRAMMING FOR STUDENT		
			LECTURE	SEMINAR			DESCRIPTION	CLASS HOURS	HOMEWORK HOURS (Maximum 7h)
1	1	Topic 1 - Introduction to wireless communications <ul style="list-style-type: none"> ▪ Kind of services: bearer services, added value services ▪ Wireless networks: trunk networks, mobile systems, PAN, LAN, WAN, sensor networks ▪ The radio electric spectrum. 	X			No	Reading the documentation and materials of the course	1.66	6
1	2	Topic 2 - The radio electric channel <ul style="list-style-type: none"> ▪ Elements of the link ▪ Friis's formula ▪ Diffraction ▪ Noise model 	X			No	Reading and studying the class subjects	1.66	
2	3	Topic 2 - The radio electric channel <ul style="list-style-type: none"> ▪ Exercises 		X		No	Problems 1-4 of Topic 2.	1.66	6
2	4	Topic 2 - The radio electric channel <ul style="list-style-type: none"> ▪ Mobile propagation ▪ Okumura Hata ▪ Walfish-COST ▪ Indoor propagation models 	X			No	Reading and studying the class subjects	1.66	

3	5	Topic 2 - The radio electric channel <ul style="list-style-type: none"> ▪ Exercises 		X		No	Problems 5-7 of Topic 2	1.66	6
3	6	Topic 2 - The radio electric channel <ul style="list-style-type: none"> ▪ Lab session ▪ Propagation models for wireless communications 		X	LAB	No	Preparation of the Laboratory session. Preparation and delivery of a written report on the session	1.66	
4	7	Topic 3 - Statistical channel models <ul style="list-style-type: none"> ▪ Impulse channel response ▪ Slow fading ▪ Rayleigh and Rice channels ▪ Fading statistics 	X			No	Reading and studying the class subjects	1.66	6
4	8	Topic 3 - Statistical channel models <ul style="list-style-type: none"> ▪ Exercises 		X		No	Problems 1-3 of Topic 3	1.66	
5	9	Topic 3 - Statistical channel models <ul style="list-style-type: none"> ▪ Wide band channel models ▪ Delay and Doppler Spreads ▪ Transverse filter channel model ▪ COST 207 channel model 	X			No	Reading and studying the class subjects	1.66	6
5	10	Topic 3 - Statistical channel models <ul style="list-style-type: none"> ▪ Exercises 		X		No	Problems 4-7 of Topic 3	1.66	
6	11	Topic 4 - Capacity of wireless channels. <ul style="list-style-type: none"> ▪ Flat fading channels ▪ Channel state information at the receiver ▪ Ergodic and outage capacity ▪ Capacity of multiple access and broadcast channels 	X			No	Reading and studying the class subjects	1.66	6
6	12	Topic 4 - Capacity of wireless channels. <ul style="list-style-type: none"> ▪ Exercises 		X		No	Problems 1-2 of Topic 4	1.66	

7	13	Topic 5 - Cellular systems <ul style="list-style-type: none"> ▪ Cellular geometry ▪ Rhombus numbers ▪ Cochannel interference 	X			No	Reading and studying the class subjects	1.66	6
7	14	Topic 5 - Cellular systems <ul style="list-style-type: none"> ▪ Exercises 		X		No	Problems 1-3 of Topic 5	1.66	
8	15	Topic 5 - Cellular systems <ul style="list-style-type: none"> ▪ Cellular sub-division ▪ Limits on the cell size ▪ Interference and traffic in CDMA systems 	X			No	Reading and studying the class subjects	1.66	6
8	16	Part exam of topics 1-5 Topic 5 - Cellular systems <ul style="list-style-type: none"> ▪ Part exam of topics 1-5 ▪ Exercises 		X		No	Problems 4-5 of Topic 5. Part exam	1.66	
9	17	Topic 6 - 2G Mobile networks planning <ul style="list-style-type: none"> ▪ GSM radio system ▪ GSM subsystems ▪ Traffic, control and signalling channels 	X			No	Reading and studying the class subjects	1.66	6
9	18	Topic 6 - 2G Mobile networks planning <ul style="list-style-type: none"> ▪ Base station and mobile equipment ▪ GSM standarda and link balance 	X			No	Reading and studying the class subjects	1.66	
10	19	Topic 6 - 2G Mobile networks planning <ul style="list-style-type: none"> ▪ Exercises 		X		No	Problems 1-4 of Topic 6	1.66	6
10	20	Topic 6 - 2G Mobile networks planning <ul style="list-style-type: none"> ▪ Lab session ▪ Planning a GSM system 		X	LAB	No	Preparation of the Laboratory session. Preparation and delivery of a written report on the session	1.66	

11	21	Topic 7 - 3G Mobile networks planning <ul style="list-style-type: none"> ▪ UMTS services ▪ UMTS architecture ▪ Codes in UMTS 	X			No	Reading and studying the class subjects	1.66	6
11	22	Topic 7 - 3G Mobile networks planning <ul style="list-style-type: none"> ▪ UMTS equipment ▪ UMTS specifications ▪ UMTS link budget 	X			No	Reading and studying the class subjects	1.66	
12	23	Topic 8 - 4G Mobile networks planning <ul style="list-style-type: none"> ▪ Exercises 		X		No	Problems 1-3 of Topic 7	1.66	6
12	24	Topic 3 - Statistical channel models <ul style="list-style-type: none"> ▪ Lab session ▪ Planning a UMTS systems 		X	LAB	No	Preparation of the Laboratory session. Preparation and delivery of a written report on the session	1.66	
13	25	Topic 8 - 4G Mobile networks planning <ul style="list-style-type: none"> ▪ LTE Architecture and services ▪ LTE channels ▪ LTE modulation and resources ▪ MIMO in LTE 	X			No	Reading and studying the class subjects	1.66	6
13	26	Topic 8 - 4G Mobile networks planning <ul style="list-style-type: none"> ▪ LTE equipment ▪ LTE specifications ▪ LTE link balance 	X			No	Reading and studying the class subjects	1.66	
14	27	Topic 7 - 3G Mobile networks planning <ul style="list-style-type: none"> ▪ Exercises 		X		No	Problems 1-4 of Topic 8	1.66	
14	28	Part exam of topics 6-8 Topic 5 - Cellular systems <ul style="list-style-type: none"> ▪ Part exam of topics 6-8 ▪ Exercises about topics 6 to 8 		X		No	Problems of 6-8 Topics. Part exam	1.66	

14	29	Topic 8 - 4G Mobile networks planning <ul style="list-style-type: none"> ▪ Lab session ▪ Planning a LTE system 		X	LAB	No	Preparation of the Laboratory session. Preparation and delivery of a written report on the session	1.66	6
Subtotal 1 - 132,14								48,14	84

15		Exam preparation						3	14,86
16									
17									
Subtotal 2 - 17,86								3	14,86

TOTAL (Total 1+ Total 2. Maximum 180 hours)								150,00 hours
----------------------------------------------------	--	--	--	--	--	--	--	---------------------