uc3m | Universidad **Carlos III** de Madrid

COURSE: Wireless and mobile networking		
DEGREE: Telematics Engineering	YEAR: 4th	TERM: 1st

WEEKLY SCHEDULE OF THE COURSE								
WEEK	SESSION	DESCRIPTION	GRUPS (mark with X)		SPECIAL ROOM FOR SESSION (Computer class room, audio-visual classroom)	Indicate YES/NO if the session requires 2 teachers	WEEKLY WORK FOR STUDENT		
			LECTURES	SEMINARS			DESCRIPTION	CLASS HOURS	HOMEWORK HOURS (Max. 7h per week)
1	1	**Part I: Introduction** • Presentation and introduction of the course. • Introduction to Wireless and mobile networks.	X			No	- Read the documents associated to session 3 (**).	1,66	7h
1	2	**Part II: Wireless Networks** ***Topic II.1: Introduction to the IEEE 802.11 networks*** • Introduction to wireless networks. • The IEEE 802.11 family of standards. • IEEE 802.11: terminology, network topologies, frame format and addressing. • Standardization of wireless networking: the IEEE.		X		No	- Review the concepts of session 2. - Read the documents associated to session 4 (**).	1,66	

2	3	**Topic II.2: Medium access control in IEEE 802.11** • IEEE 802.11 Medium access control protocol.	X			No	- Review the concepts of session 3. - Prepare and do the exercises of session 5.	1,66	
2	4	**Topic II.3: Mobility support in the IEEE 802.11 family** • Basic roaming in IEEE 802.11. • Advanced roaming extensions in IEEE 802.11. • Introduction to the roaming optimization in wireless networks.		X		No	- Review the concepts of session 4. - Read the documents associated to session 6 (**).	1,66	7h
3	5	• Exercises of Wireless network design and performance analysis.	X			No	- Review the concepts of session 5. - Read the documents associated to session 7 (**).	1,66	7h
3	6	**Part III: Mobility in IP networks** **Topic III.1: Introduction to IP mobility** • The problem of mobility management and alternatives to provide it. • Standardization of IP mobility: the IETF.		X		No	- Review the concepts of session 6. - Prepare the Knowledge Test I. - Start preparing the Lab I.	1,66	
4	7	**Topic III.2: Mobile IPv6** • Terminology. • Basic operation. • Signaling. • Data transfer.	X			No	- Review the concepts of session 7. - Read the documents associated to session 9 (**).	1,66	7h
4	8	• Lab I: Wireless networks + Mobility (I).		X	Virtual online lab.	Yes	- Continue preparing the Lab I.	1,66	
5	9	• Knowledge Test I (wireless networks): S02-S05.	X			No	- Read the documents associated to session 11 (**). - Read the documents associated to Case of	1,66	7h

							Study I.		
5	10	• Lab I: Wireless networks + Mobility (II).		X	Virtual online lab.	Yes	- Continue preparing the Lab I. - Finish Case of Study I.	1,66	-
6	11	• Case of Study I: "PMIPv6: architecture and operation".	X			No	- Review the concepts of session 11. - Read the documents associated to session 13 (**).	1,66	7h
6	12	• Lab I: Wireless networks + Mobility (III).		X		No	- Continue preparing the Lab I. - Prepare the Knowledge Test II.	1,66	
7	13	**Part IV: Mobile Cellular Communications** *Topic IV.1: Introduction to mobile cellular networks* • Introduction to cellular mobile networks. • The evolution of mobile cellular networks. • Standardization of mobile cellular networks: 3GPP and ETSI.	X			No	- Review the concepts of session 13. - Read the documents associated to session 15 (**). - Prepare the Knowledge Test II.	1,66	7h
7	14	• Knowledge Test II (IP mobility): S06-S12.		X		Yes	- Continue preparing the Lab I.	1,66	
8	15	*Topic IV.2: 2G (GSM)* • Terminology and network architecture.	X			No	- Review the concepts of session 15. - Read the documents associated to session 17 (**).	1,66	7h
8	16	• Lab I: Wireless networks + Mobility (IV).		X	Virtual online	Yes	- Continue preparing the Lab I.	1,66	

9					lab.				
9	17	**Topic IV.3: 2.5G (GPRS), 3G (UMTS)** • Interconnection of cellular networks with external packet switched networks. • GPRS. • UMTS.	X			No	- Review the concepts of session 17.	1,66	7h
9	18	• Lab I: Wireless networks + Mobility (V).		X	Virtual online lab.	Yes	- Continue preparing the Lab I.	1,66	
10	19	**Topic IV.4: 4G** • EPS introduction. • EPS terminology. • Interconnection with heterogeneous Access networks. • EPS architecture. • Mobility management. • Network connection. • Handoffs. • Connection scenarios. • *Roaming*.	X			No	- Review the concepts of session 19. - Read the documents associated to session 21 (**).	1,66	7h
10	20	• Lab I: Wireless networks + Mobility (VI).		X	Virtual online lab.	Yes	- Continue preparing the Lab I.	1,66	
11	21	**Topic IV.5: 5G** • Introduction and motivation: why do we need 5G? • The role of virtualization in 5G: introduction to SDN and NFV.	X			No	- Review the concepts of session 21. - Read the documents associated to session 23 (**).	1,66	7h
11	22	• Lab I: Wireless networks + Mobility (VII).		X	Virtual online	Yes	- Continue preparing the Lab I.	1,66	

					lab.			
12	23	• 5G architecture	X			No	- Review the concepts of session 23. - Read the documents associated to session 25 (**).	1,66
12	24	• Lab I: Wireless networks + Mobility (VIII)		X	Virtual online lab.	Yes	- Finish the deliverable associated to Lab I. - Prepare the Case of Study II	1,66
13	25	• Case of Study II: Multi-access Edge Computing (MEC)	X			No	- Review the concepts of session 25. - Prepare the Lab II.	1,66
13	26	• Lab II: 4G (I)		X	Virtual online lab.	No	- Continue preparing the Lab II. - Prepare Knowledge Test III.	1,66
14	27	• Knowledge Test III (mobile cellular communications): S13-S25.	X			No	- Continue preparing the Lab II.	1,66
14	28	• Lab II: 4G (II)		X	Virtual online lab.	Yes	- Finish the deliverable associated to Lab II.	1,66
	29	• Lab I and II (extra session).		X	Virtual online lab.	Yes		1,66

The "7h" values appear in the rightmost column for the week groupings (weeks 12, 13, 14).

							Subtotal 1	48,33	98

Total 1 *(Hours of class plus student homework hours between weeks 1-14)*	146,33

15		Extra sessions, tutorships, assignments delivery, etc.						
16		• Preparation of the evaluation and evaluation (only for non-continuous evaluation)					3	7
17								
18								
						Subtotal 2	3	7
				Total 2 *(Hours of class plus student homework hours between weeks 15-18)*			10	
TOTAL *(Total 1 + Total 2. Maximum 180 hours)*							156,33	

(*) The homework description refers to the work that the student has to do to prepare the session of the same type on the following week

(**) The references are, depending on the session, slides with lecture notes, short articles or selected parts of the recommended books. Most of the provided material will be in English.

Note on evaluation: The continuous evaluation mark is composed of three parts:

- o Deliverables (problems, cases of study, etc): 20%.
- o Lab results (based on milestones and/or short reports, there may be additional lab tests): 45%.
- o Knowledge tests (during the sessions): 35%.