

ECE 525E – WIRELESS & MOBILE COMMUNICATION TEACHING SCHEDULE

DURATION	MAIN TOPIC	SUB-TOPICS	CATS	PRACTICAL SESSIONS
WEEK 1	Principles of Wireless & Mobile Communication	• Discussion of the Syllabus, course objectives, course expectations and where to get reference materials • Personal communication services and their evolution • Multiple access: Aloha, Pure Aloha, Slotted Aloha • Controlled access and channelization		
WEEK 2	First Generation wireless communication systems	• Generations of wireless communication systems • Low-tier and high tier systems • Advanced Mobile Phone service(AMPS) • Electronic Total Access System (ETACS) • Nordic Mobile Telephone System (NMT)		Lab exercises on low-tier communication systems
WEEK 3	Second Generation Mobile communication systems	• Evolution of Mobile cellular communication systems • Comparison of first generation and second generation systems • GSM architecture		GSM Lab
WEEK 4	Principles of GSM	• GSM bands and RF channels • GSM bursts • GSM logical channels		
WEEK 5	GSM systems	• GSM authentication • GSM encryption	CAT 1	GSM Lab
WEEK 6	Data services and location management	• GSM data services: baseband, HSCSD, GPRS • GSM identifiers • Location management in wireless cellular communication networks		GSM Lab

DURATION	MAIN TOPIC	SUB-TOPICS	CATS	PRACTICAL SESSIONS
WEEK 7	Handoff in cellular networks Timing advance	• Hard, soft and softer handoff • Handoff techniques-non-prioritized, queuing priority and subrating • Timing advance in GSM networks		MMUST Computer Laboratory
WEEK 8	CDMA and WCDMA	• Review of spread spectrum techniques • IS-95 principles • WCDMA system architecture		Spread spectrum Lab CDMA Lab WCDMA Lab
WEEK 9	Mobile radio wave propagation	• Near field and far field • Ray models • Hata Okumura model	CAT 2	Matlab and Simulink exercises
WEEK 10	MIMO and OFDMA	• Principles of SISO, SIMO and MIMO • Principles of OFDMA		OFDMA Lab
WEEK 11	Long Term Evolution (LTE)	• 4G systems • LTE architecture • Future trends – 5G and beyond		
WEEK 12-13		• Revision		

Text Books

(i) Tse and P. Viswanath, Fundamentals of Wireless Communication, Cambridge University Press; ISBN-10: 0521845270

(ii) William Stallings, Wireless Communications and Networks, Pearson, ISBN-10: 0131918354

Prof. James A. Kulubi