



**AMERICAN UNIVERSITY
OF CYPRUS**

Course Code
MNC351

Course Name
Wireless and Mobile Networks

ECTS Credit
7.5

Pre-Requisite
CS208

Course Type
Major Elective

Language of Instruction
English

Year of Study
3rd/5th

Level of Course
BSc/1st Cycle

Mode of Delivery
On Campus

Course Objectives:

The aim of the course is to examine the structure and architecture of wireless and mobile networks, systems and applications. The mobility of nodes and end-users has behavioral implications on all layers of the OSI protocol stack from the Data Link up to the Application Layer. Handling and adapting to mobility necessitates the introduction changes in the protocol stack. Emerging applications enabled due to mobility will be investigated too.

Learning Outcomes:

Upon successful completion of this course students should be able to:

- Recall, classify and describe wireless technologies.
- Analyse cellular wireless network topologies.
- Analyse and compute physical property of wireless networks.
- Recall and evaluate radio resource management techniques.
- Compare and evaluate different wireless communication protocols

Teaching Methodology:

Lectures 42 Hours

Labs 30 Hours

Course Content

Introduction

Wireless technology, transmission fundamentals, antennas and propagation, signal encoding techniques, coding and error control.

Satellite Communications: Classification of satellite orbits, GEO orbit, LEO orbit, MEO orbit, link performance factors, capacity allocation strategies

Cellular wireless networks: Cellular network organization, frequency reuse, hand-off strategies and metrics, power control, traffic engineering, traffic intensity, cellular wireless networks systems and services, GSM, GPRS, SMS, UMTS.

Mobile IP: Mobile IP uses and operation, registration, authentication, tunneling.

Wireless LANs: Wireless LANs technologies, WLANs applications, the IEEE 802.11 standards and operation, hand-offs, fast hand-offs. Ad-hoc networks, issues in ad-hoc networks, routing in ad-hoc networks, encryption in ad-hoc networks. Wireless Sensor Networks, architecture and network protocols.

Bluetooth techniques: Bluetooth Application Areas Bluetooth Protocol Architecture, usage models, frequency hopping, Bluetooth audio, Bluetooth Link security

Assessment Methodology:

Final Exams

Labs/Assignment

Mid term

Required Textbooks/Reading:

Title	Author(s)	Publisher	Year
WIRELESS COMMUNICATIONS AND NETWORKS	William Stallings	Prentice Hall	
WIRELESS AND MOBILE NETWORK ARCHITECTURES	Yi-Bing Lin, Imrich Chlamtac	John Wiley & Sons	
WIRELESS MULTIMEDIA COMMUNICATION NETWORKING VIDEO, VOICE, AND DATA	Ellen Kayata Wesel	Addison-Wesley	
WIRELESS COMMUNICATION PRINCIPLES & PRACTICES	Theodore S. Rappaport	Prentice Hall	
PRINCIPLES OF WIRELESS NETWORKS	K. Pahlavan and P. Krishnamurthy	Prentice Hall	
AD HOC WIRELESS NETWORKS: ARCHITECTURES AND PROTOCOLS	C. Siva Ram Murthy, B.S. Manoj	Pearson Education	