



Ministry of Higher Education and Scientific Research
Lebanese French University – Erbil
College of Engineering and Computer Science
Department of Computer Networking



Wireless & Mobile Network-II

Fourth Year – Second Semester

Asst. Prof. Ashish Sharma

Academic Year: 2023 – 2024

Course Book



S. No.	Information	Details
1.	Course Name	Wireless & Mobile Network
2.	Course Code	CN402WMN
3.	Lecturer In-charge	Ashish Sharma
4.	College/Department	College of Engineering & Computer Science / Department of Information Technology
5.	Contact Information	E-mail: ashish.sharma@lfu.edu.krd Mobile No.: 0964-7507231261
6.	Time (in hours) per Week	Theory:2 Practical: 2
7.	Office Hours	8:30 AM - 3:00 PM
8.	Teacher's Academic Profile	<p>Master of Technology in Computer Science (CS) Degree passed in 2012 from Jamia Hamdard University Campus, New Delhi, India, with an 08.09 CGPA. (Division: First)</p> <p>Master of Computer Applications passed in 2007 from MIET, Meerut, UP, India, affiliated with UP Technical University Lucknow, India. (Division: First)</p> <p>Bachelor of Science passed in 2003 from NAS PG Degree College, Meerut, UP, India, affiliated to CCS. University, Meerut, UP, India with (Mathematics, Optical Instrumentation, and Physics). (Division: Second)</p> <p>I work on minimizing the technical gap of our society from technological and physical aspects by contributing areas of research work: Education Improvement Research, Artificial Intelligence, Blockchain, and the Internet of Things. I have presented and attended various Training, Workshops, Conferences, and Seminars to enhance or share my knowledge/ideas. So far, I have published more than ten (10) Research Articles, a Book Chapter, and a Patent in various reputed International Journals.</p>
9.	Academic Title	Assistant Professor
10.	Keywords	Wireless Network Programming Socket API Programming Mobile Network Programming
11.	Course Overview:	The goal of this course is to provide deeper understanding of different classes of networks and to enhance the application design and development skills in wireless networks. This course provides an explanation on the wireless network concepts, architectures, protocols, and applications. It covers



	wireless network architectures, basics of wireless networking, wireless network reference model, wireless communication problems, and various other issues in wireless networks including mobility, bandwidth scarcity, delays, security, routing, etc.
12.	<p>Aims & Objective: Learning Objectives includes Upon completing this course, students will:</p> <ul style="list-style-type: none"> • Introduce the concept of wireless media. • Know the frequency spectrum for wireless communications. • Review the principles of coding and modulation schemes. • Understand wireless local area networks (WLANs). • Understand the architecture of WLANs. • Study the protocols of different layers of WLANs and illustrate the applications of WLANs.
13.	<p>Course Requirement: The tasks assigned to the students in this article are to attend weekly theoretical and practical lectures, as well as to assign the students to the theoretical, practical aspect and to complete the reports on the material.</p>
14.	<p>Teaching and Learning Method:</p> <ul style="list-style-type: none"> • Book, Data Show and PowerPoint, white board, Lectures, homework's, and assignments.
15.	<p>Assessment Scheme:</p> <ul style="list-style-type: none"> • 5 % Attendance • 10 % Class Tests and Quizzes • 25 % Mid-term Examination • 10 % Practical Exam • 50 % Final Examination
16.	<p>Students Learning Outcome: Students will: After completing the course, students are expected to:</p> <ul style="list-style-type: none"> • Design the wireless transmission and switching technologies. • Understood the diversity techniques for wireless systems. • Implement performance improvement techniques for wireless communication systems.
17.	<p>Course Reading List and References: Textbooks</p> <ul style="list-style-type: none"> • Wireless and Mobile Networks – Concepts & Protocols, Sunil Kumar & Mahabaleshwar, Wiley Publications. • Wireless and Mobile Network Architectures, Yi-Bing Lin & Imrich, Wiley Publications. • Fundamentals of Wireless Communication, David Tse and Pramod Viswanath, Cambridge University Press. • Python Network Programming Cookbook, Pradeeban Kathiravelu, Dr. M. O. Faruque Sarker, Packt Publishing. • Introduction to Python Programming, Gowrishankar S., Veena A., Taylor & Francis Group.
18.	Course Content

Course Content



S. No.	Lecture Date	No. of Hours	Topics
1.	Week 1	4	Introduction to Wireless Networks <ul style="list-style-type: none"> Printing your machine's name and IPv4 address Retrieving a remote machine's IP address
2.	Week 2	4	Python Basics for Wireless Programming <ul style="list-style-type: none"> Introduction to Python for Networking Basics of Python Programming
3.	Week 3	4	<ul style="list-style-type: none"> Working with Python IDEs and Editors Introduction to Python Libraries for Networking (e.g., socket, requests)
4.	Week 4	4	Wireless Protocols <ul style="list-style-type: none"> Introduction to Wireless Protocols (TCP/IP, UDP, HTTP, etc.) Socket API Overview
5.	Week 5	4	<ul style="list-style-type: none"> Hands-on with Socket Programming in Python Wireshark basics for analyzing wireless network traffic
6.	Week 6	4	TCP Sockets Echo Client and Server
7.	Week 7	4	<ul style="list-style-type: none"> Echo Server Echo Client Running the Echo Client and Server Viewing Socket State
8.	Week 8	4	Mobile Networking <ul style="list-style-type: none"> Introduction to Mobile Networking GSM, 3G, 4G, and 5G Technologies
9.	Week 9	4	<ul style="list-style-type: none"> Mobile IP and Handover Mechanisms Python Applications in Mobile Networking
10.	Week 10	4	Communication Breakdown Handling Multiple Connections
11.	Week 11	4	<ul style="list-style-type: none"> Multi-Connection Client and Server Multi-Connection Server Multi-Connection Client Running the Multi-Connection Client and Server
12.	Week 12	4	Application Client and Server <ul style="list-style-type: none"> Application Protocol Header Sending an Application Message
13.	Week 13	4	<ul style="list-style-type: none"> Application Message Class Running the Application Client and Server
14.	Week 14	4	Location-Based Services <ul style="list-style-type: none"> Introduction to Location-Based Services GPS and Geo-Location in Wireless Networks Implementing Location-Based Services in Python



15.	Week 15	Examination
19.	Examinations:	
20.	Course Policy: Designed to cover the structure, implementation, and theoretical underpinnings of Wireless and Mobile networks.	
21.	Notes: Students will work in groups to prepare a 20-minute presentation on a topic of their choosing. The presentations will be conducted during the last few weeks of class.	