SARVAJANIK UNIVERSITY
Sarvajanik College of Engineering and Technology
Bachelor of Technology

B. Tech. Semester VIII

Subject Name: **Wireless and Mobile Computing** **Subject Code: BTEC13803**
Type of course: PEC
Prerequisite: Signals & Systems, Analog and Digital Communication
Rationale: Wireless networks and Mobile computing is a young and dynamic field. Ubiquitous access to information, anywhere, anyplace, and anytime, will characterize whole new kinds of information systems in the 21st century. These are being enabled by rapidly emerging wireless communications systems such as Cellular transmissions, Personal Communications Systems, Mobile IP, Wireless Local Area networks (LANs), Ad Hoc networks, Sensor networks etc.

Teaching and Examination Scheme:

Teaching Scheme				Theory Marks			Practical Marks		Total
L	T	P	C	TEE	CA1	CA2	TEP	CA3	100
3	0	0	3	60	25	15	--	--	

CA1: Continuous Assessment (assignments/projects/open book tests/closed book tests **CA2:** Sincerity in attending classes/class tests/ timely submissions of assignments/self-learning attitude/solving advanced problems **TEE:** Term End Examination **TEP:** Term End Practical Exam (Performance and viva on practical skills learned in course) **CA3:** Regular submission of Lab work/Quality of work submitted/Active participation in lab sessions/viva on practical skills learned in course

Content:

Sr. no.	Topics	Teaching Hrs.	Module % Weightage
1.	**Review of Wireless Communication and Handoff:** Types of handoff, Handoff Initiation, Handoff Decision, Handoff Schemes	5	15
2.	**Location Management in Cellular Networks:** Cellular Networks, Location Management, Common Assumptions for Performance Evaluation, Location Management Schemes	7	15
3.	**Traffic Integration in Personal, Local, and Geographical Wireless Networks:** A Technology for WPAN: Bluetooth, Technologies for High-Speed WLANs, Fair Scheduling in Wireless Packet Data Networks - Models and Issues, Wireless Fair Queuing Architecture, Algorithms for Wireless Fair Queuing, Issues and Future Directions	9	20
4.	**Data Broadcast:** Introduction, Data Scheduling, Air Indexing, Other Issues Ensemble Planning for Digital Audio Broadcasting - The	8	20

	Ensemble Planning Problem, Basic Solution Techniques, Lower Bounds, A Tabu Search Method		
5.	**Security and Fraud Detection in Mobile and Wireless Networks:** Introduction, Network Security Problems, Network Security Management Plan, Intrusion Detection Systems (IDS), Securing Data Transfer in Digital Mobile Systems, Securing Wireless Ad Hoc Networks, Authentication of Mobile Users, Subscription and Fraud Detection in Mobile Phone Systems	8	15
6.	**Power Optimization in Routing Protocols for Wireless and Mobile Networks:** Background, Energy Analysis of AODV and DSR Routing Protocols, Power-Aware Routing Metrics, Routing Based on Balanced Energy Consumption of Nodes, Broadcast and Multicast Tree Construction, Topology Control Using Transmit Power Adjustment	8	15

Suggested Specification table with Marks (Theory/Practical):

% Distribution of Marks					
R Level	**U Level**	**A Level**	**N Level**	**E Level**	**C Level**
30	30	15	15	5	5

Legends: R: Remembrance, **U:** Understanding; **A:** Application, **N:** Analyze, **E:** Evaluate **C:** Create and above Levels **(Revised Bloom's Taxonomy)**

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Reference Text Books:

Sr. No.	Title of book /article	Author(s)	Publisher and details like ISBN	Year of publication	Publication Edition
1.	Wireless and Mobile network Architectures	Yi-Bang Lin	Wiley-India	2000	Latest
2.	Wireless Communications Principles and Practice	Theodore S. Rappaport	Pearson	2010	2nd
3.	Wireless Communications & Networks	William stallings	Pearson Prentice Hall	2004	2nd
4.	Mobile IP : Design Principles And Practice	Charles E. Perkins	Prentice Hall	1997	Latest
5.	Design and Deployment of 4G-LTE Network- A	Ayman Elnashiar,	Wiley	2014	Latest

	practical Approach	Mohamed A. Elnaidny,			
6.	5G Mobile and Wireless Communications Technology	Afif Osseiran, Jose F Montserrat	Cambridge University Press	2016	Latest

Course Outcome:

Sr. No.	CO Statement After learning this subject students will be able to	Marks % weightage
CO-1	Describe the fundamentals of handoff initiation and decision.	20
CO-2	Design basic cellular networks with location management.	15
CO-3	Apply Traffic Integration in Wireless Networks with fair scheduling wireless data networks.	20
CO-4	Describe Ensemble Planning for Digital Audio Broadcasting	20
CO-5	Apply Security and Fraud Detection mechanism for Authentication of Mobile Users and Fraud Detection	10
CO-6	Analyze Power Optimization in Routing Protocols for Wireless and Mobile Networks:	15

Mapping with POs:

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO-1	2	2	1	1	1	2	2	1	1	1	2	3	1	1	1
CO-2	3	2	3	3	2	2	2	2	1	1	3	3	3	1	2
CO-3	3	2	3	3	2	3	2	1	1	1	3	3	3	1	2
CO-4	1	2	1	2	1	2	2	1	1	2	2	3	1	1	2
CO-5	2	3	3	3	1	2	2	1	1	1	3	2	2	1	3
CO-6	3	3	2	3	1	2	3	1	2	1	2	3	2	1	2

List of Open Source/learning website:

- https://nptel.ac.in/courses/106106167-Introduction to Wireless and Cellular Communications