

## SEMESTER S6

### WIRELESS & MOBILE COMPUTING

(Common to CS/CM/AM)

<b>Course Code</b>	<b>PECST633</b>	<b>CIE Marks</b>	40
<b>Teaching Hours/Week (L: T:P: R)</b>	3:0:0:0	<b>ESE Marks</b>	60
<b>Credits</b>	3	<b>Exam Hours</b>	2 Hrs 30 Min.
<b>Prerequisites (if any)</b>	None	<b>Course Type</b>	Theory

#### Course Objectives:

1. To enable the learners to acquire advanced concepts on wireless communication systems and mobile ad-hoc networks.
2. To impart the basics of mobile computing, architecture of wireless transmission systems and next generation networks
3. To Learn the communication protocols, various architectures and security features used in mobile computing.

#### SYLLABUS

<b>Module No.</b>	<b>Syllabus Description</b>	<b>Contact Hours</b>
<b>1</b>	Wireless LAN - Advantages, Design goals, Applications, Infrastructure Vs Ad-hoc mode, IEEE 802.11 System Architecture, Protocol Architecture, Physical layer, Medium Access Control layer, HIPERLAN-1, Bluetooth	<b>9</b>
<b>2</b>	Introduction to mobile computing – Functions, Middleware and Gateways, Application and services. Mobile computing architecture – Internet: The Ubiquitous network, Three-tier architecture for Mobile Computing, Design considerations for mobile computing.	<b>8</b>
<b>3</b>	Spread spectrum – Direct sequence, Frequency hopping. Medium Access Control – Space Division Multiple Access (SDMA), Frequency Division Multiple Access (FDMA), Time Division Multiple Access (TDMA), Code Division Multiple Access (CDMA). Satellite Systems – Basics, Applications, Geostationary Earth Orbit (GEO), Low Earth Orbit (LEO), Medium Earth Orbit (MEO), Routing, Localization, Handover. Telecommunication Systems - Global System for Mobile Communication (GSM)	<b>9</b>

<b>4</b>	Mobile network layer – Mobile Internet Protocol (IP), Dynamic Host Configuration Protocol (DHCP), Mobile ad-hoc networks – Routing, Dynamic Source Routing (DSR), Destination Sequenced Distance Vector (DSDV), Ad-hoc routing protocols; Mobile transport layer – Traditional Transmission Control Protocol (TCP), Improvements in Classical TCP; Security issues in mobile computing - Information security, Security techniques and algorithms, Security models.	<b>10</b>
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**Course Assessment Method**  
**(CIE: 40 marks, ESE: 60 marks)**

**Continuous Internal Evaluation Marks (CIE):**

Attendance	Assignment/ Microproject	Internal Examination-1 (Written)	Internal Examination- 2 (Written )	Total
5	15	10	10	40

**End Semester Examination Marks (ESE)**

*In Part A, all questions need to be answered and in Part B, each student can choose any one full question out of two questions*

Part A	Part B	Total
<ul style="list-style-type: none"> <li>● 2 Questions from each module.</li> <li>● Total of 8 Questions, each carrying 3 marks</li> </ul> <p style="text-align: center;"><b>(8x3 =24 marks)</b></p>	<ul style="list-style-type: none"> <li>● Each question carries 9 marks.</li> <li>● Two questions will be given from each module, out of which 1 question should be answered.</li> <li>● Each question can have a maximum of 3 subdivisions.</li> </ul> <p style="text-align: center;"><b>(4x9 = 36 marks)</b></p>	<b>60</b>

## Course Outcomes (COs)

At the end of the course students should be able to:

Course Outcome		Bloom's Knowledge Level (KL)
<b>CO1</b>	Explain the various mobile computing applications, services, design considerations and architectures	<b>K2</b>
<b>CO2</b>	Describe the various technology trends for next generation cellular wireless networks and use the spreading concept on data transmission	<b>K2</b>
<b>CO3</b>	Summarize the architecture of various wireless LAN technologies	<b>K2</b>
<b>CO4</b>	Identify the functionalities of mobile network layer & transport layer and various security issues in mobile computing	<b>K2</b>

Note: K1- Remember, K2- Understand, K3- Apply, K4- Analyse, K5- Evaluate, K6- Create

### CO-PO Mapping Table (Mapping of Course Outcomes to Program Outcomes)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
<b>CO1</b>	3	3	3									3
<b>CO2</b>	3	3	3									3
<b>CO3</b>	3	3	3									3
<b>CO4</b>	3	3	3									3
<b>CO5</b>	3	3	3									3

Note: 1: Slight (Low), 2: Moderate (Medium), 3: Substantial (High), -: No Correlation

Text Books				
Sl. No	Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year
1	Mobile Computing Technology - Application and Service Creation	Asoke K. Talukder, Hasan Ahmad, Roopa R Yavagal	McGraw Hill	2/e, 2010
2	Mobile Communications	Jochen Schiller	Pearson	2/e, 2000
3	Fundamentals of 5G Mobile Networks	Jonathan Rodriguez	Wiley	1/e, 2015

<b>Reference Books</b>				
<b>Sl. No</b>	<b>Title of the Book</b>	<b>Name of the Author/s</b>	<b>Name of the Publisher</b>	<b>Edition and Year</b>
1	Mobile Computing	Raj Kamal	Oxford University Press	2/e, 2011
2	Computer Networks,	Andrew S. Tanenbaum	PHI	3/e, 2003
3	Wireless Communications Principles and Practice	Theodore S. Rappaport	PHI	2/e, 2004
4	Fundamentals of Networking and Communication	Curt M. White	Cengage learning	7/e, 2013

<b>Video Links (NPTEL, SWAYAM...)</b>	
<b>No.</b>	<b>Link ID</b>
<b>1</b>	<a href="https://archive.nptel.ac.in/courses/106/106/106106147/">https://archive.nptel.ac.in/courses/106/106/106106147/</a>