

Devi Ahilya University, Indore, India Institute of Engineering & Technology				IV Year B.E. (INFORMATION TECHNOLOGY)				
Subject Code & Name		Instructions Hours per Week			Credits			
8ITRC3 Principles of Mobile Computing		L	T	P	L	T	P	Total
		3	1	0	3	1	0	4
Duration of Theory Paper: 3 Hours								

Learning Objectives:

1. To introduce students to ideas and techniques from Mobile Computing that are widely used in Computer Science.
2. Provide the fundamentals of formal techniques for Mobile Computing.

Prerequisites: Nil.

Course Outcome (CO):

CO.No.	CO	PO
CO1	Understand and analyze various wireless communication technologies and the fundamentals of mobile computing, including adaptability mechanisms and models for building adaptive mobile applications.	PO-1, PO-2, PO-3, PO-4, PO-5
CO2	Explain and evaluate different mobility management techniques, such as location management, dynamic updates, caching strategies, and Mobile IP, along with real-world case studies.	PO-1, PO-2, PO-3, PO-4, PO-5
CO3	Demonstrate knowledge of data dissemination and management in mobile environments by exploring caching mechanisms, publish-subscribe models, and mobile web caching strategies.	PO-1, PO-2, PO-3, PO-4, PO-5
CO4	Apply concepts of context-aware computing and service discovery middleware to develop adaptive mobile applications, ensuring efficient service discovery, security, and interoperability in ubiquitous computing environments.	PO-1, PO-2, PO-3, PO-4, PO-5
CO5	Analyze and implement service discovery mechanisms, including advertisement protocols, event handling, security considerations, and interoperability challenges, to enhance the efficiency of mobile computing systems.	PO-1, PO-2, PO-3, PO-4, PO-5

CO-PO Relationship:

CO	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12
CO1	3	3	2	2	3	-	-	-	-	-	-	-
CO2	3	3	2	2	3	-	-	-	-	-	-	-
CO3	3	3	2	2	3	-	-	-	-	-	-	-
CO4	3	3	2	2	3	-	-	-	-	-	-	-
CO5	3	3	2	2	3	-	-	-	-	-	-	-

Course Contents

Unit-I

Review of Wireless communication technologies. Mobile computing definition, difference between Mobile communication and mobile computing, Adaptability-key to mobile computing, mechanisms for Adaptation, Support for building Adaptive Mobile Applications-Transcoding Proxy, Odyssey, Rover Models

Unit-II

Mobility Management:

Mobility Management, Location Management principles and techniques: registration area based Location management, dynamic update schemes, location caching, replicating location information, flat and hierarchical organization, location management case studies PCS, Mobile IP

Unit-III

Data Dissemination and Management

Challenges, Publish-subscribe mode, information caching, Data Dissemination, mobile data caching, mobile cache Maintenance schemes, Mobile Web Caching

Unit-IV

Context Aware Computing:

Ubiquitous or Pervasive Computing, Context: various definitions and Types, Context Aware Computing and Applications, Middleware support, Middleware for application development: Adaption and Agents.

Unit-V

Service Discovery Middleware: Finding needed Services, Services, Discovery and Advertisement Protocols, Garbage Collection, Eventing, Security, Interoperability.

Learning Outcomes:

1. Explain the fundamentals of mobile computing and differentiate it from mobile communication while understanding adaptability mechanisms and models like Transcoding Proxy, Odyssey, and Rover.
2. Describe and analyze mobility management techniques, including location management, caching strategies, and Mobile IP, and apply them in real-world scenarios.
3. Evaluate data dissemination and management techniques, including publish-subscribe models, caching mechanisms, and mobile web caching, to optimize mobile data access.
4. Demonstrate the role of context-aware computing in mobile environments by designing adaptive applications using middleware frameworks and intelligent agents.
5. Implement service discovery mechanisms while addressing key challenges such as advertisement protocols, event handling, security, and interoperability in mobile systems.

Books Recommended:

1. Frank Adelstein, Sandeep K. Gupta, Golden G. Richard, Loren Schwiebert, Fundamentals of Mobile and Pervasive Computing, McGraw-Hill Education (India), 2005.
2. Reading material from other online sources.