

# 15B1WCI731: Mobile Computing

**Course Credit: 3**

**Semester: VII**

## **Introduction**

Mobile Phones have emerged as truly pervasive and affordable information and communication technology platform in the last decade. So there is a growing need for a course which can teach students the skills needed to program and configure mobile devices and networks, enabling them to develop new and exciting applications for existing and emerging hardware technology. The objective of the course is to equip students on the fundamentals of mobile computing and the design mobile services. Learn the issues in mobile computing and communications from the hard- ware and software perspective. Understand the mobile IP stack and mobile web access, technologies and services.

## **Course Objectives (Post-conditions)**

### **Knowledge objectives:**

At the conclusion of the course, following learning objectives are expected to be achieved:

1. Introduce enabling technologies of pervasive computing.
2. Acquire solid knowledge on mobile networks and mobile computing.
3. Develop applications that are mobile-device specific and demonstrate current practice in mobile computing contexts.
4. Understand the concepts of Adhoc and wireless sensor networks.
5. Understand the concepts of Mobile IP.
6. To be able to analyze the performance of different handoff, roaming, and location update algorithms for cellular networks.
7. Awareness of professional and ethical issues, in particular those relating to security and privacy of user data and user behavior.
8. Describe the possible future of mobile computing technologies and applications.

### **Application objectives:**

At the conclusion of the course, following learning objectives are expected to be achieved:

- Develop applications that are mobile-device specific and demonstrate current practice in mobile computing contexts.
- Develop Android specific applications
- Develop Windows specific applications
- To be able to analyze the performance of different handoff, roaming, and location update algorithms for cellular networks.

## **Expected Student Background (Preconditions)**

Students are expected to have a solid grasp of the introduction to computer programming.

## **Topics Outline:**

S NO	Topics	Hrs
1.	Introduction to Ubiquitous Computing	1
2.	Introduction to Android Operating system <ul style="list-style-type: none"> <li>• Introduction to the emerging technology</li> <li>• Architecture</li> <li>• Installation Setup</li> <li>• The Activity Class</li> <li>• The Intent Class</li> <li>• Permissions</li> <li>• Creating the UI</li> <li>• Storing and Retrieving Data</li> <li>• User Notifications</li> <li>• Broadcast Receivers</li> <li>• Networking</li> <li>• Location and maps</li> <li>• Sensors</li> </ul>	9
3.	Introduction to Windows Operating Systems <ul style="list-style-type: none"> <li>• Architecture</li> <li>• Installation Setup</li> <li>• Introduction to XAML</li> <li>• Understanding the Navigation Model</li> <li>• Understanding the apps lifecycle and managing states</li> <li>• Building UI</li> <li>• Sensors</li> <li>• Storing and Retrieving data</li> </ul>	9
4.	Mid Sem project demo	1
5.	WiFi <ul style="list-style-type: none"> <li>• Physical Layer</li> <li>• Channel Coding</li> <li>• How the physical layer works</li> <li>• Link Layer MAC Protocols</li> <li>• Link Adaption Protocols</li> <li>• Energy Efficiency in WiFi</li> <li>• Cellular Systems</li> </ul>	6
6.	Mobile IP <ul style="list-style-type: none"> <li>• Mobility in Network Layer</li> <li>• Internet protocols for Mobile Applications</li> <li>• Single Hop Mobility</li> <li>• Mobile IP and Issues</li> </ul>	4

	<ul style="list-style-type: none"> <li>• Handoff Issues</li> </ul>	
7.	Routing <ul style="list-style-type: none"> <li>• Routing Protocols in MultiHop Networks</li> <li>• MultiHop routing metrics</li> </ul>	3
8.	MANET	2
9.	Student presentations on Emerging New Technologies in Mobile Computing Area	4-5
10.	End Sem Project Demo	2
	Total	42

### **References**

- 1) Beginning Android Application Development by Wei-Meng Lee, Wiley Publication
- 2) Windows Phone 8 Development Internals by Andrew Whitechapel, Sean McKenna
- 3) Handbook of wireless networks and mobile computing by Ivan Stojmenovi
- 4) An Overview of Routing Protocols in Mobile Ad-Hoc Network by Dr.S.S.Dhenakaran, A.Parvathavarthini
- 5) Professional Android Application Development by Reto Meier, Wiley publication
- 6) Windows Phone 8 Guide for Android Application Developers by Microsoft Open Technologies, Inc.
- 7) Wireless Communications and Networks by William Stallings, Second Edition

**Evaluation Scheme:**

S.No	Examination	Marks
1	T-1	15
2	T-2	25
3	T-3	35
4	*Internal Marks	25

\*Internal Marks Breakdown:

Assignments            9 marks (3x3)

Quizzes                12 marks (3x4)

Regularity            4 Marks