



**Kadi Sarva Vishwavidyalaya**  
**Faculty of Engineering & Technology**  
**Second Year Master of Engineering (Computer Engineering)**  
**(Semester-III)**

(With effect from: Academic Year 2018-19)

<b>Subject Code: MECE-303-N-C</b>	<b>Subject Title: Ubiquitous Computing</b>
<b>Pre-requisite</b>	-

**Teaching Scheme (Credits and Hours)**

Teaching Scheme				Total Credit	Evaluation Scheme					
L	T	P	Total		Theory		Mid Sem Exam	CIA	Practical	Total
Hours	Hours	Hours	Hours		Hours	Marks	Marks	Marks	Marks	Marks
04	00	02	06	05	03	70	30	20	30	150

**Learning Objectives:**

- Ubiquitous computing (UbiComp) is a concept in software engineering and computer science where computing is made to appear anytime and everywhere.
- A user interacts with the computer, which can exist in many different forms, including laptop computers, tablets and terminals in everyday objects such as a fridge or a pair of glasses.
- Course gives a broad overview of different aspects of ubiquitous computing and students work on projects related to ubiComp.

**Outline of the Course:**

Sr. No	Title of the Unit	Minimum Hours
1	Introduction Cloud Computing , Applications & Requirements	12
2	Smart Devices and Services, Cards, Device networks	09
3	Human Computer Interaction, Tagging, Sensing and Controlling	10
4	Context-Aware Systems and Intelligent System	12
5	IS Interaction and Autonomous System Artificial Life	09
6	Ubiquitous Communication & Management of Smart Devices	12
	<b>Total</b>	<b>64</b>

**Total hours (Theory): 64**

**Total hours (Lab): 32**

**Total hours: 96**



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**Detailed Syllabus:**

Sr. No.	Topic	Lecture Hours	Weight age (%)
1	<b>Introduction Cloud Computing , Applications &amp; Requirements:</b> <ul style="list-style-type: none"> <li>• Modelling the key Ubiquitous Computing Properties</li> <li>• System Environment Interaction</li> <li>• Architecture Design: Smart DEI Model</li> <li>• Example Early UbiCom Research Projects</li> <li>• Everyday Application in the virtual, Human and Physical world</li> </ul>	12	18
2	<b>Smart Devices and Services, Cards, Device networks:</b> <ul style="list-style-type: none"> <li>• Service Architecture Models</li> <li>• Service provision lifecycle</li> <li>• Virtual Machines and operating Systems</li> <li>• Smart Mobile Devices, users, Resources and code</li> <li>• OS for Mobile Computers and communicator Devices</li> <li>• Smart Card Devices and Device Networks</li> </ul>	09	15
3	<b>Human Computer Interaction, Tagging, Sensing and Controlling:</b> <ul style="list-style-type: none"> <li>• User interface and Interaction for widely used devices</li> <li>• Hidden UI via Basic Smart, Wearable and Implanted Devices</li> <li>• Human Center Design, User Models, IHCI Design</li> <li>• Tagging and Physical world, Sensors and Sensors Networks</li> <li>• MEMS, Embedded system and Real-time System</li> <li>• Control System , Robots</li> </ul>	10	16
4	<b>Context-Aware Systems and Intelligent System:</b> <ul style="list-style-type: none"> <li>• Introduction and Modelling</li> <li>• Mobility and Spatial, ICT Awareness</li> <li>• Basic Concepts of IS, Architecture</li> <li>• Semantic KB IS, Classical Logic IS Soft Computing IS Models, Operations</li> </ul>	12	18
5	<b>IS Interaction and Autonomous System Artificial Life:</b> <ul style="list-style-type: none"> <li>• Interaction Multiplicity, Design, Application</li> <li>• Basic Autonomous Intra-Acting Systems</li> <li>• Reflective and Self-Aware System</li> <li>• Self-management and Autonomic Computing, Artificial Life</li> </ul>	09	15
6	<b>Ubiquitous Communication &amp; Management of Smart Devices :</b> <ul style="list-style-type: none"> <li>• Audio, data &amp; wireless data Networks,</li> <li>• Universal &amp; Transparent data network access</li> <li>• Ubiquitous Networks &amp; Design Issues</li> <li>• Managing Virtual, Human User Centered &amp; Physical environment</li> </ul>	12	18
<b>Total</b>		64	100



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**Instructional Method and Pedagogy:**

- At the start of course, the course delivery pattern, prerequisite of the subject will be discussed.
- Lectures will be conducted with the aid of multi-media projector, black board, OHP etc.
- Attendance is compulsory in lecture and laboratory which carries 10 marks in overall evaluation.
- One internal exam will be conducted as a part of internal theory evaluation.
- Assignments based on the course content will be given to the students for each unit and will be evaluated at regular interval evaluation.
- Surprise tests/Quizzes/Seminar/tutorial will be conducted having a share of five marks in the overall internal evaluation.
- The course includes a laboratory, where students have an opportunity to build an appreciation for the concepts being taught in lectures.
- Experiments shall be performed in the laboratory related to course contents.

**Learning Outcome:**

On successful completion of this course, the student should be able to:

- Understand the basic applications and requirements of Ubiquitous Computing
- Be able to learn context aware systems
- To know about Ubiquitous communications
- Understand about Ubiquitous Systems
- To know about human interaction issues and social issues in Ubiquitous Computing

**Reference Books:**

1. Ubiquitous Computing: Smart Devices, Environments and Interactions, Stefan Poslad , 1st Edition, Wiley.
2. Ubiquitous Computing Fundamentals, John Krumm, 1st Edition, CRC Press
3. Computer Human Interaction, 6th Asia Pacific Conference, APCHI 2004, Rotorua, New Zealand, June 29-July 2, 2004. Proceedings
4. Methods and technologies for experimenting with ubiquitous computing, VTT Electronics
5. Jochen Burkhardt, Horst Henn, Stefan Hepper, Thomas Schaec & Klaus Rindtorff. --- Pervasive Computing Technology and Architecture of Mobile Internet Applications, Addison Wesley, Reading, 2002.

**List of experiments**

Sr. No.	Name of Experiment
1	To Study WML and Write a WML Scripting for a simple calculator
2	Write a WML Scripting Application to Design mobile phonebook.
3	Write a J2ME program to display hello world on the screen
4	Write a program to create a Phone Book MIDlet
5	WAP in J2ME shows how to display a simple LOGIN SCREEN on the J2ME phone and how to authenticate to a HTTP server.
6	WAP in J2ME to send SMS
7	To study XML and WAP in detail. Sample Program using XML and WAP
8	To study Tiny OS and Run sample application on it.
9	To study Tossim Simulator and Run sample program on it
10	Technical White Paper on Wearable computing.