

Course Code	Course Name	Teaching Scheme (Hrs./Week)			Credits Assigned			
		Theory	Practical	Tutorial	Theory	Practical/Oral	Tutorial	Total
BEITC7056	Ubiquitous Computing	04	02	---	04	01	---	05

Course Code	Course Name	Examination Scheme							
		Theory Marks				Term Work	Practical	Oral	Total
		Internal assessment			End Sem. Exam				
		Test 1	Test 2	Avg. of 2 Tests					
BEITC7056	Ubiquitous Computing	20	20	20	80	25	---	25	150

### Course Objectives:

- To introduce the ideas of ubiquitous computing techniques based on human experience.
- To generate an ability to design, analyze and perform experiments on real life problems using various smart devices, smart interaction and smart environment.
- To integrate computation into the environment, rather than having computers as distinct objects.
- To enable people to move around and interact with computers more naturally than they currently do.

### Course Outcomes:

On successful completion of this course the student has: Knowledge and understanding regarding:

- The objectives and the historical development of the field of ubiquitous computing
- Fundamentals of sensor technology and sensor networks
- Apply middleware techniques to implement ubiquitous computing systems
- Design of new (often embedded) interactive artifacts
- Context aware and adaptive systems
- Compare the usability of alternative design of interactions for specific ubiquitous computing systems

**DETAILED SYLLABUS:**

<b>Sr. No.</b>	<b>Module</b>	<b>Detailed Content</b>	<b>Hours</b>
1	Introduction to Ubiquitous Computing	Definition, Advantage, Application and Scope. Properties of Ubiquitous Computing, Ubiquitous System Environment Interaction. Architectural Design for UbiCom Systems: Smart DEI Model.	4
2	Smart Devices and Services	Introduction to Smart Devices: Users, Mobiles, Cards and Device Networks. Service Architecture Models. Service Provision Life-Cycle. Virtual Machines and Operating Systems Mobile Computers and Communicator Devices.	8
3	Sensing and Controlling	Tagging the Physical World. Sensors and Sensor Networks. Micro Actuation and Sensing: Micro-Electro-Mechanical Systems (MEMS). Embedded Systems and Real-Time Systems. Control Systems for Physical World Tasks. Robots	8
4	Context-Aware Systems	Introduction to Context-Aware Computing, Context-Aware Systems, Context-Aware Applications, Designing and Implementing Context-Aware Applications, Issues for building Context-Aware Applications.	8
5	Human-Computer Interaction	User Interfaces and Interaction for Four Widely Used Devices. Hidden UI Via Basic Smart Devices. Hidden UI Via Wearable and Implanted Devices. Human-Centered Design (HCD). User Models: Acquisition and Representation. iHCI Desi	10
6	Ubiquitous Communication	Data Networks. Audio Networks. Wireless Data Networks. Universal and Transparent Audio, Video and Alphanumeric Data. Ubiquitous Networks. Network Design Issues. Human Intelligence Versus Machine Intelligence. Challenges in Ubiquitous System, Social Issues: Promise Versus Peril.	10

**Text Books:**

- [1] Stefan Poslad. Ubiquitous Computing: Smart Devices, Environments and Interactions, Wiley Publication.
- [2] John Krumm. Ubiquitous Computing Fundamentals. CRC Press.

**References:**

- [1] Yin-Leng Theng and Henry B. L. Duh. Ubiquitous Computing: Design, Implementation, and Usability. IGI Global.
- [2] Adam Greenfield. Everywhere the Drawing age of Ubiquitous Computing, Published in Association with AIGA.
- [3] Mobile and Ubiquitous Computing”, Georgia Tech, 2003.

**Term work:**

Term work will be based on Practical and Assignments covering the topics of the syllabus.

**Suggested Practical List (If Any):**

1. Applications for location-based messages
2. Global Positioning system
3. Context-Aware system
4. Human Computer Interaction
5. Ubiquitous Communication
6. Case study of Class Room 2020
7. Case study of Super Market
8. Case study of Hospital Management

**Theory Examination:**

- Question paper will comprise of 6 questions, each carrying 20 marks.
- Total 4 questions need to be solved.
- Q.1 will be compulsory, based on entire syllabus where in sub questions of 2 to 3 marks will be asked.
- Remaining question will be randomly selected from all the modules.

Weight age of marks should be proportional to number of hours assigned to each module.