21IOT06	WEARABLE COMPUTING	L	T	P	C
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Course Objectives

- To understand advanced and emerging technologies in wearable computing
- To learn how to use software programs to perform varying and complex tasks
- Expand upon the knowledge learned and apply it to solve real world problems

UNIT I	INTRODUCTION TO WEARABLE COMPONENTS	9 Hours

Introduction – History – Open-Source Platforms – PIC - Arduino, Sketch, Raspberry Pi, Iterative coding methodology – Python Programming - Mobile phones and similar devices - Arm Devices - Basic Electronics (circuit theory, measurements, parts identification)

UNIT II	BUILDING BLOCKS FOR WEARABLE COMPUTING	9 Hours

Bluetooth Low Energy (BLE) - Embedded Software Programming - Sensors for Wearables - Data from Wearable Device Android Wear - Apple Watch Kit - Cloud Services - Google Fit - Apple Health Kit

UNIT III	INNOVATION WITH WEARABLES	9 Hours

Process for Lifestyle Innovation - Prototyping and Modelling - Working with a Wearable Device - Three-Tier Architecture for Wearables - Useful Design Patterns and Methods - Multi- threading and Concurrency for Wearables - Performance Tuning Retrieval and Analysis of Sensor Data

UNIT IV	FRAMEWORKS FOR WEARABLE COMPUTING	9 Hours

Software: open Frameworks (C/C++) - "Arduino" Language (C/C++) - Hardware: Desktop / Laptop / Raspberry Pi - Representing "reality" with computers. Digital vs. Analog circuits, audio, communication, Analog to Digital Conversion - Digital to Analog Conversion)– Microcontrollers - Communication – Serial& Parallel - Hardware to Hardware Communication - I2C/IIC (Inter-Integrated Circuit) - SPI (Serial Peripheral Interface)

UNIT V	CYBERNETICS	9 Hours

Wearables - Augmented Reality – Mixed Reality. Case studies, Oculus Rift (2012, 2013), AR versus VR - IoT and Wearables: Smart Cites and Wearable Computing as a form of urban design - Advanced I/O – open Frameworks: Live Network feeds (push and pull) - Data persistence (saving data and preferences)

UNIT VI	CASE STUDY	9 Hours

Wearable Technologies

Course Outcome:

1. Develop Android and Wear applications for Android phone and wearable device, including handling and making device data ready for Google Fi
2. Learn about software, hardware tools, protocols and components required for Wearable Computing
3. Enable to explore innovations with Wearable's
4. Learn about the requirements to design Frameworks for Wearable Computing
5. Exploring regulatory systems—their structures, constraints, and possibilities
6. Able to learn about I/O communication protocols
7. Gain insights into Augmented Reality Space Wearable technologies Through case studies.

Text Books:

- Linowes Jonathan, Augmented Reality for Developers, 1st edition, Packt Publishing Limited, 2017
- Fortino, Giancarlo, Raffaele Gravina, and Stefano Galzarano, Wearable computing: from modeling to implementation of wearable systems based on body sensor networks, 1st edition, John Wiley & Sons, 2018.

Reference Books:

- Simon Monk , Programming the Raspberry Pi: Getting Started with Python 2nd edition, 2016
- Barfield, Woodrow, ed. Fundamentals of wearable computers and augmented reality, 1st edition, CRC press, 2015.