

# WEARABLE COMPUTING SYLLABUS

## Module 1: Introduction to Wearable Components

- History
- Internet of Things and Wearables
- Wearables' Mass Market Enablers
- Human-Computer Interface and Human-Computer Relationship
- A Multi-Device World

## Module 2: Building Blocks for Wearable Computing

- Bluetooth Low Energy (BLE)
- Embedded Software Programming
- Sensors for Wearables
- Android Wear
  - Notification Settings and Control
  - Wear Network
  - Android Wear API
    - DataItem
    - DataMapItem
    - DataMap
- Google Fit API
  - Main Package
  - Data Sub-Package

## Module 3: Body Sensor Networks

- Typical m-Health System Architecture
- Hardware Architecture of a Sensor Node
- Communication Medium
- Power Consumption Considerations
- Communication Standards
- Network Topologies

- Commercial Sensor Node Platforms
- Bio-Physiological Signals and Sensors
- BSN Application Domains
- Developing BSN Applications
- Programming Abstractions
- Requirements for BSN Frameworks
- BSN Programming Frameworks

#### **Module 4: Autonomic and Agent-Oriented Body Sensor Networks**

- Task-Oriented Programming in BSNs
- SPINE Framework
- Task-Based Autonomic Architecture
- Autonomic Physical Activity Recognition
- Agent-Oriented Computing and Wireless Sensor Networks
- Mobile Agent Platform for Sun SPOT (MAPS)
- Agent-Based Modeling and Implementation of BSNs
- Reference Architecture for Collaborative BSNs
- C-SPINE: A CBSN Architecture

#### **Module 5: Integration of Wearable and Cloud Computing**

- Background
- Motivations and Challenges
- Reference Architecture for Cloud-Assisted BSNs
- BodyCloud: A Cloud-Based Platform for Community BSN Applications
- Engineering Body Cloud Applications
- SPINE-Based Design Methodology

#### **Module 6: SPINE-Based Body Sensor Network Applications**

- Introduction
- Background
- Physical Activity Recognition

- Step Counter
- Emotion Recognition
- Handshake Detection
- Physical Rehabilitation

## **Module 7: Installing SPINE**

- Introduction
- SPINE 1.x
  - Install SPINE 1.x
  - Use SPINE
  - Run a Simple Desktop Application Using SPINE 1.3
  - SPINE Logging Capabilities
- SPINE 2
  - Install SPINE 2
  - Use the SPINE 2 API
  - Run a Simple Application Using SPINE 2



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