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DEEMED TO BE
UNIVERSITY
ONLINE
NAVI MUMBAI

Certificate Program
Internet of Things

Subject Name: Programming in Python

Total Units: 14

UNIT 1

- Unit 1: Python Basics Keywords and Identifiers
- Unit 2: Python Variables and Definitions
- Unit 3: Python Data Types
- Unit 4: Python Operators

UNIT 2

- Unit 5: Python Control Statements
- Unit 6: Looping Statements - I
- Unit 7: Looping Statements - II

UNIT 3

- Unit 8: Python Lists
- Unit 9: Python Tuples
- Unit10: Python Sets
- Unit 11: Python Dictionary

UNIT 4

- Unit 12: Python Functions
- Unit 13: Arrays in Python
- Unit 14: Exception Handling in Python

Subject Name: Foundations of IoT

Total Units: 4

Unit – I

- Unit 1: Introduction to Internet of Things: Definition & Characteristics of IoT, Physical Design of IoT
- Unit 2: Things in IoT & IoT Protocols, IoT Communication Models & IoT Communication APIs

Unit – 2

- Unit 3: IoT Enabling Technologies, Wireless Sensor Networks, Cloud Computing, Big Data Analytics
- Unit 4: Communication Protocols, Embedded Systems
- Unit 5: IoT Levels & Deployment Templates

Unit – III

- Unit 6: Domain Specific IoTs:Home Automation, Cities: Smart Parking, Smart Lighting, Smart Roads
- Unit 7: Domain Specific IoTs: Structural Health Monitoring, Surveillance, Emergency Response

Unit – IV

- Unit 8: Domain Specific IoTs: Retail
- Unit 9: Domain Specific IoTs: Environment: Weather Monitoring, Air Pollution Monitoring, Noise Pollution Monitoring, Forest Fire Detection, River Floods Detection
- Unit 10: Domain Specific IoTs: Energy: Smart Grids, Renewable Energy Systems, Prognostics
- Unit 11: Domain Specific IoTs: Industry: Machine Diagnosis & Prognosis
- Unit 12: Domain Specific IoTs: Logistic: Route Generation & Scheduling, Fleet Tracking, Shipment Monitoring, Remote Vehicle Diagnostics
- Unit 13: Domain Specific IoTs: Agriculture: Smart Irrigation, Green House Control
- Unit 14: Domain Specific IoTs: Health & Lifestyle: Health & Fitness Monitoring, Wearable Electronics

Subject Name: IoT Platforms

Total Units: 14

Unit – 1

- Unit 1: IoT and M2M, Difference between IoT and M2M
- Unit 2: Software Defined Networking, Network Function Virtualization, SDN and NFV for IoT
- Unit 3: IoT System Management, Need for IoT Systems Management
- Unit 4: Simple Network Management Protocol (SNMP), Limitations of SNMP

Unit – 2

- Unit 5: Developing Internet of Things & IoT Platforms Design Methodology
- Unit 6: IoT System for Weather Monitoring
- Unit 7: IoT Systems - Logical Design using Python, Python Data Types & Data Structures
- Unit 8: Python Control Flow, Functions, Modules, Packages, File Handling, Date/Time Operations, Classes, Python Packages of Interest for IoT

Unit – 3

- Unit 9: IoT Physical Devices & Endpoints, Basic building blocks of an IoT Device
- Unit 10: Case Studies Illustrating IoT Design: Home Automation and Cities: Smart Parking
- Unit 11: Case Studies Illustrating IoT Design: Environment and Productivity Applications: IoT Printer
- Unit 12: Introduction to Cloud Storage Models & Communication APIs

Unit – IV

- Unit 13: WAMP - AutoBahn for IoT
- Unit 14: Python Web Application Framework – Django, Amazon Web Services for IoT, SkyNetIoT Messaging Platform

Subject Name: Wireless Sensor Protocols

Total Units: 14

UNIT 1

- Unit 1: Principals of Cellular Communications
- Unit 2: Frequency Reuse Concept
- Unit 3: Method of Locating Cochannel Cells
- Unit 4: Cochannel Interference Reduction Methods

UNIT 2

- Unit 5: Basic Cellular System
- Unit 6: Components of Cellular System
- Unit 7: Operation of Cellular System

UNIT 3

- Unit 8: 3G Digital Cellular Technology
- Unit 9: 2.5G CDMA One Cellular Technology
- Unit10: The IMT-2000 Global Standards

UNIT 4

- Unit 11: Emerging Wireless Network Technologies
- Unit 12: IEEE 802.15 WPAN Technology
- Unit 13: Mobile Ad-hoc Networks (MANETs)
- Unit 14: Wireless Sensor Networks (WSNs)