1. Introduction to IoT

1.1. Defining IoT
1.2. Data flow in IoT
1.3. Understanding IoT Architecture
1.4. IoT Applications around the world

2. Sensors and Actuators

2.1. Introduction
2.2. Sensors
2.3. Actuators
2.4. Hands-on #1: Connecting

3. Arduino

3.1. Introduction
3.2. Arduino Internals – API's and IO.
3.3. Setting Programming Environment
3.4. Arduino C Programming
3.5. Hands-on #1: Glow an LED
3.6. Hands-on #2: Environmental Monitoring
3.7. Hands-on #3: Connecting Aurdino with Pi

4. Raspberry Pi

4.1. Introduction
4.2. Pi Internals
4.3. Configuring the Raspberry Pi (NOOBS and Other languages & Tools)
4.4. Python Programming
4.5. Hands-on #1: GPIO
4.6. Hands-on #2: Web Stack

5. Protocal

5.1 IoT Communication Protocol
- 5.1.1 IoT Wireless Protocols
- 5.1.2 IoT Communication Channels
- 5.1.3 IoT Network Protocols
- 5.1.4 Comparison of the Network protocols
- 5.1.5 Introductions to IPv4 and IPv6

5.2 MQTT IOT Protocol
- 5.2.1 MQTT with Raspberry Pi

6. Messaging Communication

6.1. Channels
6.2. Protocol
6.3. Service Bus Queues
6.4. Message Routing
6.5. Hands on #1: Azure Message Communication
- 6.5.1. To Configure Connection Strings
- 6.5.2. Using the Azure IoT SDK
- 6.5.3. To Send a Messages or sensor data

6.6. Hands on #2: AWS Message Communication
- 6.6.1. To Configure Connection Strings
- 6.6.2. To Send a Message or sensor data

7. IoT Device Management

7.1. Introduction
7.2. Hands on #1: Azure based Device Management
7.3. Hands on # 1 – Direct Method
- 7.3.1. To Make a Continuously Running Function
- 7.3.2. To Receive Direct Methods
- 7.3.3. To Invoke a Direct Method
- 7.3.4. Additional Functionality

7.4. Hand on #2 – Device Simulation

7.4.1. To Create an IoT Device ID
7.4.2. Simulated Device App
7.4.3. To Create an App That Invokes the Direct Method
7.4.4. To Run the Simulated Firmware Update

8. Azure IoT Hub

8.1. Fundamentals
8.1.1. Azure IoT Internals
8.1.2. Real World IoT Solutions
8.1.3. Azure IoT SDKs and Tools
8.1.4. Setting Programming Environments
8.2. Hand #1: Azure IoT Device: Node.js SDK
8.2.1. Azure IoT Gateway SDK
8.2.2. Azure IoT Hardware and Software
8.2.3. IoT Hub Messaging
8.2.4. Azure IoT Preconfigured Solutions
8.2.5. Azure IoT Preconfigured Solutions - Remote Monitoring Demo
8.2.6. Azure IoT Management Tools
8.2.7. Securing My IoT Deployments
8.2.8. Message and Device Security
8.3. Hands on #2: Creating an IoT Hub
8.3.1. To Create an IoT Hub Service Using the Azure Portal
8.3.2. To Create an IoT Hub Service Using Azure CLI
8.3.3. To Register Your IoT Device with Your IoT Hub

9. AWS IoT Suite

9.1. Introduction
9.2. Walk through on IoT Suite internal & services
9.3. Hands on #1: Connecting Pi with AWS IoT Suite
9.4. Hand on #2 – AWS Lambda
9.4.1. Create a Lambda
9.4.2. Integrate to Lambda
9.4.3. Triggering Lambda
8.5. Hands on #3: Building Application pipeline with AWS Greengrass

10. IoT Analytics and ML

- 10.1. Introduction to Bigdata
- 10.2. Techniques and Tools
- 10.3. Hands on #1: Stream Analytics
  - 10.3.1. Stream Analytics Job
  - 10.3.2. Stream Analytics Input & Output
  - 10.3.3. Service Bus Namespace and Queue
  - 10.3.4. Stream Analytics Query
- 10.4. Hand on #2: Predictive Analytics for AWS IoT

11. IoT Solution & Security

- 11.1. Introduction
- 11.2. IoT Reference Architecture
- 11.3. Hands on #1: AWS Microservices REST API
- 11.4. Hands on #2: IoT Azure Service Fabric
- 11.5. IoT Security
  - 11.5.1. Security Architecture
  - 11.5.2. Endpoint and Device Security
  - 11.5.3. Implementation Obstacles
  - 11.5.4. Best Practices
  - 11.5.5. Usecases

12. Business Intelligence, Storage and Visualization

- 12.1. Fundamentals
  - 12.1.1. Introduction
  - 12.1.2. Data Storage Options
  - 12.1.3. DocumentDB
  - 12.1.4. Azure Cosmos DB
  - 12.1.5. Data Visualization and Storytelling
  - 12.1.6. Introduction to Power BI
  - 12.1.7. Power BI Software
  - 12.1.8. Configuration: To Set Up the Lab Environment