

UNLV College of Engineering

Course: Internet of Things Workshop

Instructor: Grzegorz Chmaj

Dates: TBA

Syllabus prepared by: Grzegorz Chmaj

Schedule of Events

- Start time for each day to be set by International Programs Director
- Each day class is 2h or 3h of duration
- Classes are Monday, Tuesday, Wednesday, Thursday

Day 1

Welcome reception – meeting with students, introductions, general explanations about the workshop

Day 2

Objective: General introduction to Internet of Things

Topics covered in the class:

- Lecture: Introduction to IoT and related technology
- Hands-on: IoT Simulator
- Hands-on: Online IoT Platform

Day 3

Objective: Basics of programming / program control

Topics covered in the class:

- Lecture: Programming and basic structures – introduction
- Hands-on: scratch tool - maze
- Hands-on: scratch tool - variables

Day 4

Objective: Introduction to Arduino platform

Topics covered in the class:

- Lecture: Basics of Arduino and sensors
- Hands-on: simple Arduino programs
- Hands-on: simple sensor connection

Day 5

Objective: Provide knowledge about nodes used in IoT

Topics covered in the class:

- Lecture: IoT nodes: overview of available products, important parameters
- Hands-on: nodes usage, connecting sensors

Day 6

Objective: Provide knowledge about sensors used in IoT

Topics covered in the class:

- Lecture: Sensors in IoT: types, classifications, overview of available solutions
- Hands-on: building sensor from available components
- Hands-on: use of the sensors

Day 7

Objective: Teach the communication technologies used in IoT

Topics covered in the class:

- Lecture: IoT related communication protocols and platforms
- Hands-on: Arduino UNO online programming
- Hands-on: online circuit wiring

Day 8

Objective: Introduce RFID and NFC, show what role they play in IoT

Topics covered in the class:

- Lecture: Characterization of RFID and NFC technologies and their role in IoT
- Hands-on: IFTTT platform

Day 9

Objective: Teach the general idea of operating system and what characteristics do the IoT operating systems have

Topics covered in the class:

- Lecture: General description of OS and its role in IoT systems, types of OSes
- Hands-on: Arduino MKR1000 and wireless network connection

Day 10

Objective: Explain the concepts of Machine Learning and Big Data – and their role in IoT

Topics covered in the class:

- Lecture: Machine Learning and Big Data – introduction and their applications in IoT
- Hands-on: interfacing the temperature sensor with the cloud
- Hands-on: remote sensor readings

Day 11

Objective: Talk about the technologies that are used in IoT but haven't been discussed earlier during the workshop. Summary the technologies used in IoT, with focus on technologies that are IoT-specific

Topics covered in the class:

- Lecture: The overview of technologies that are used in Internet of Things systems
- Hands-on: building mobile apps for IoT using app generator

Day 12

Objective: Discuss the concepts of IIoT, CIIoT and overview the tools that are used when working with IIoT and for the design of IIoT systems.

Topics covered in the class:

- Lecture: Target types of IIoT: IIoT, CIIoT, tools used in IIoT
- Hands-on: final project work: the flood detection system with internet connection and notifications sent to the smartphone/email/other.

Day 13

Objective: Discuss the future of IIoT, directions, coming technologies and concepts. Summary.

Topics covered in the class:

- Lecture: Future directions of IIoT systems, summary of the workshop.
- Hands-on: final project work: the flood detection system with internet connection and notifications sent to the smartphone/email/other (continuation)
- Hands-on: final project demonstrations.