Introduction to IoT Course (IOT102)

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Class Rules and Contact Information

- Attendance is checked at the beginning of the class and may be checked again at the end of class.
  - 10 minute-late is consider a no-show.
- Any activities which are not relevant to the course is restricted.
- Keep you table clean and tidy.
- Should you have any issues, ask me during break time of at the end of each class.
- Submit your homework on time.
- Only contact me through email when you really need help.
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Syllabus Description

- This is a 3-credit course.
- The content includes basic concepts and applications of IoT, practical exercises on the learning KIT.
- Students are taught how to learn online, and practice some parts at home.
- Q&A sessions, the guidance for important issues, as well as performance assessments, will be conducted in the classroom.

Main Objectives

- Knowledge
  - Understanding the basic concepts of Internet of Things: "things" of the Internet of Things, networking IoT, programming IoT, securing IoT.
  - Knowing about electrical circuits and electronics.
  - Understanding the applications of IoT.
- Skills
  - Programming IoT
  - Planning project concept and implementation.

Student's Tasks

- Students must attend at least 80% of offline sessions in order to be accepted to the final examination.
- Student is responsible to learn all VIDEOs (theory) online given by instructor on Syllabus at home (See Guide documentation).
- Student is responsible to do all LABs given by instructor on Syllabus at home (See Tutorial documentation).
- Constantly follow announcements on intranet/LMS at https://lms-hcmuni.fpt.edu.vn for up-to-date course information.

Studying Resources

- Slides
- Video
- Course from Edx:
  - Introduction to the Internet of Things
  - IoT Sensors and Devices
- Books:
  - Cuno Pfister , Getting Started with the Internet of Thing, Oreilly, 2011
  - Alan G. Smith, Introduction to Arduino: A piece of cake!, 2011.
- Documents:
  - https://www.arduino.cc
- Instructables.com - 20 Unbelievable Arduino Projects
- Tutorials
- Electronics Component List

Schedule

- 8 Lectures
- 23 Labs
- 1 Presentation
- 2 Progress Tests
- 1 Project

Project Descriptions

PROJECT REQUIREMENTS	
1	Wireless communications: WiFi/Bluetooth/LoRa
2	Read data from sensors
3	Process the collected data
4	Display/Visualize data in display device or web/mobile app
5	Control the actuators: manually or automatically according to the processed data

PROJECT TASKS	
1	Draw block diagram
2	Electronic component specifications
3	Create circuit schematic/hardware interface/wiring diagram
4	Develop programming flowchart
5	Implement a prototype
6	Conduct experiments to test the functionality of the system under different conditions
7	Prepare a project report and presentation

Project Evaluation

- Evaluation committee: 1 class instructor, 1 other instructor
- Presentation time: 20 minutes, Q&A time: 10 minutes

#	Evaluation Criteria	Descriptions	Max Points
1	Final Report Document	Assessment of the submitted final report	15
2	Presentation	Evaluation of the oral presentation	15
3	Block diagram	Analysis of the operational principle of the system depicted in the diagram	15
4	Flowchart	Evaluation of the system programming depicted in the flowchart	15
5	Demonstration	Assessment of how well the system operates according to the intended design	20
6	Q&A	Evaluation of students' comprehension of their project's execution	20
Total			**100**

Assessment Scheme

https://flm.fpt.edu.vn > View Syllabus > Code = IOT102t

On-going assessment	**80%**
Active Learning - Check results at progress at the Progress tab of each student (5%) - Active Participant in Labs (5%)	10%
01 Presentation	10%
02 Progress Test	5% + 5%
01 On-Going Project Assessment	30%
01 Final Project Evaluation	20%
Final exam	**20%**

- Completion Criteria:
  - 1. Active Learning | Presentation | Progress Test > 0
  - 2. On-Going Project Assessment ≥ 4
  - 3. Final Exam Score ≥ 4 & Final Result ≥ 5

Schedule

SLOT 1	
Lectures	**Labs**
Introduction of IoT Course	Getting Started with Arduino and Genuino UNO
What in the world is the Internet of Things?	Fritzing – Building Circuit
Arduino (ATmega328/p) Architecture	Tinkercad Arduino Simulator Tutorial
The 'things' of the Internet of Things?	

SLOT 2	
Lectures	**Labs**
Networking IoT	Analog Input – Analog Read
Programming IoT	Fading – Analog Write
[*Project Introduction*]	
[*Project Topic Proposal*]	

Schedule

SLOT 3	
Lectures	Labs
Securing IoT	State Change Detection for Pushbuttons
	LED Array Effect
[*Topic Registration*]	

SLOT 4	
Lectures	Labs
Electrical Circuits and Electronics	Ping Ultrasonic Range Finder
[*Block Diagram*]	Photoresistor – Analog Input

SLOT 5	
Lectures	Labs
[Presentation]	Servo Motor – Sweep
[*Advanced Labs Related to Components Used in Project*]	Servo Motor – Knob

Schedule

SLOT 6	
Lectures	Labs
[Progress Test 1]	7 Segment Display
[*Programming Flowchart*]	RGB LED Color Mixing

SLOT 7	
Lectures	Labs
	LCD Display 1602
[*Prototype Implementation*]	Temperature Sensor LM35

SLOT 8	
Lectures	Labs
[*On-going Project Assessment 1*]: Review block diagram, circuit schematic, flowchart	Keypad 4x4
	Serial Input

Schedule

SLOT 9	
Lectures	Labs
[Progress Test 2]	Blink Without Delay
[*Experiments*]	Debounce

SLOT 10	
Lectures	Labs
[*Final Report*]	

SLOT 11	
Lectures	Labs
[*On-going Project Assessment 2*] *Review for Project Presentation*	

Schedule

SLOT 12	
Lectures	Labs
[*Final Project Evaluation*]	

SLOT 13	
Lectures	Labs
[*Final Project Evaluation*]	

SLOT 14	
Lectures	Labs
[*Final Project Evaluation*]	

SLOT 15	
Lectures	Labs
[*Final Project Evaluation*]	

THANK YOU ALL FOR LISTENING

QUESTIONS AND ANSWERS