



Syllabus

1. **Course name:** Internet of Things: Foundations and Applications
2. **Course code:** ITFA336064
3. **Credits:** 3 credits (3:0:8) (3 lecture periods, 0 lab period, 6 self-study periods per week)
4. **Instructors**
 - a. Chief lecturer: Assoc. Prof. Phan Văn Ca
 - b. Co-lecturers: MEng. Trương Quang Phúc

5. Course Requirements:

Prerequisite course(s): None

Previous course(s): Embedded Systems

6. Course Description

The main aim of this course is to introduce the fundamental concepts of the Internet of Things and its applications and architecture models; the technologies and mechanisms for sensing, actuation, processing and cyber-physical data communication; Discussing semantic technologies, service oriented solutions and networking technologies that enable the integration of IoTs data and services into the cyber world.

7. Learning Outcomes (CLOs)

CLOs	Descriptions <i>On successful completion of this course students will be able to:</i>	ELO(s) /PI(s)	Compe - tency
CLO1	Describe design principles of IoT systems and IoT applications development	ELO1/PI 1.2	I
CLO2	Discuss standards and technologies such as 6LowPAN, CoAp, ETSI M2M and W3CSSN	ELO1/PI 1.2	I
CLO3	Apply digital signal processing algorithms; store and represent sensor data at different levels of the architecture	ELO7/PI 7.2	R
CLO4	Design embedded hardware based IoT	ELO9/PI 9.1	R
CLO5	Develop embedded software and mobile applications	ELO9/PI 9.1	R

8. Content outline

- Introduction to the internet of things (IoT);
- CPS systems, smart devices, and real world Interaction;
- Network layer architecture;
- IoT Architecture and Networks;
- Services and application platform;
- Smart data processing, Semantic technology and web of things;
- Security, reliability, privacy and compliance in IoT;
- Applications, Standards and CPS.

9. Teaching Methods

- Powerpoint presentation)
- Teamwork

10. Assessment(s)

- Grading scale: 10
- Assessment plan:

No.	Content	CLOs	Competency	Assessment methods	Assessment tools	Weighting %
Formative assessment						50
1	Describe design principles of IoT systems and IoT applications development	CLO1	I	Midterm test	Score sheet	15
2	Analyze and evaluate the design, standards and application for IoTs	CLO2	I	Midterm test	Score sheet	15
3	Develop applications to collect and analyze sensor data	CLO5	R	Homework	Rubric	15
4	Quiz and attendance	CLO1 , CLO2	R	Quiz	Score sheet	5
Final assessment						50
5	Design an IoT model for a specific application	CLO4	R	Project	Rubric	50

11. Learning Materials

- Textbook:

- [1] Daniel Minoli, *Building the internet of things with IPv6 and MIPv6*, Wiley, 2013.
- [2] Holler, Tsiatsis, Mulligan, Avesand, Karnouskos, and Boyle, *From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence*, Academic Press, 2014.

- References:

- [3] Contiki, TinyOS, Ns2, Ns3.

12. General Information

Academic Integrity

All students in this class are subject to HCMUTE's Academic Integrity Policy (<http://sao.hcmute.edu.vn/>) and should acquaint themselves with its content and requirements, including a strict prohibition against plagiarism. Any violations will be reported to the Faculty of Electrical and Electronic Engineering Dean's office.

Flexibility Notice

Any information in this syllabus (other than grading and absence policies) may be subject to change with reasonable advanced notice. Students need to regularly update the information of their registered class.

Intellectual Property

All contents of these lectures, including written materials distributed to the class, are under copyright protection from the HCMUTE's Intellectual Property Regulations. Notes based on these materials may not be sold or commercialized without the express permission of the instructor.

13. Approval Date: <dd/mm/yyyy>

14. Endorsement:

Dean	Head of Department	Chief Lecturer
Assoc. Prof. Dr. Nguyen Minh Tam	Assoc. Prof. Dr. Phan Văn Ca	<i><Full Name></i>

15. Revision History:

1st Revision: <i><dd/mm/yyyy></i>	Lecturer: Head of Department: Assoc. Prof. Phan Văn Ca
2nd Revision: <i><dd/mm/yyyy></i>	Lecturer: Head of Department: