

<b>Course</b>	Name	: Wireless Sensor Network and Internet of Things (IoT)
	Code	: EE184938
	Credits	: 3
	Semester	: Elective

### Description of Course

The course discuss the development of MEMS, nano technology and wireless communication systems, sensor devices and transceivers are becoming smaller, cheaper and can be deployed in large quantities for a variety of diverse applications: health, agriculture, structural monitoring, smart grids, etc. In this course students will learn the basic principles and related techniques of wireless sensor networks and IoT, namely: node architecture, physical layer, MAC protocol, routing and network protocols, security, and energy management. In addition, in the lecture, modes and concepts of JSN and IoT will be implemented that are learned on existing devices.

### Learning Outcomes

#### Knowledge

(P02) Mastering the concepts and principles of engineering, and implementing them in the form of procedures for analysis and design in power systems, control systems, multimedia telecommunications, or electronics.

#### Specific Skill

(KK01) Able to formulate engineering problems in power systems, control systems, multimedia telecommunications, or electronics.

#### General Skill

(KU12) Able to implement information and communication technology (ICT) in the context of implementation of his/her work.

#### Attitude

(S09) Demonstrating attitude of responsibility on work in his/her field of expertise independently.

### Course Learning Outcomes

#### Knowledge

Mastering the concepts and techniques of wireless sensor and IoT networks, namely: device architecture, MAC and network protocols, the concept of spatial sensing, aggregation and computation of distributed data, and examples of their applications.

#### Specific Skill

Able to explain the working principles of JSN and IoT devices, protocols for ad hoc wireless networks and be able to analyze JSN and IoT performance in terms of capacity, throughput and energy use.

#### General Skill

Able to use software and tools for JSN and IoT simulation and development, for example: Matlab, TinyOS, ns-3.

#### Attitude

Show an attitude of responsibility for work in his area of expertise independently.

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### Main Subjects

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1. Introduction to developments, examples and applications of wireless sensor networks and IoT
2. Important factors in JSN and IoT design
3. JSN node architecture
4. Physical layer
5. Medium Access Control (MAC) Layer
6. Network layer
7. Energy saving algorithms
8. Localization techniques
9. IoT system architecture and devices
10. Integration and interoperability of IoT systems
11. Security on JSN and IoT

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### Reference(s)

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- [1] Walteneagus Dargie & Christian Poellabuer, "Fundamentals of Wireless Sensor Networks: Theory and Practice," 2nd ed., Wiley, 2010.
- [2] Ian F. Akyildiz & Mehmet Can Vuran, "Wireless Sensor Networks," Wiley, 2010.
- [3] Dimitrios Serpanos & Marilyn Wolf, "Internet-of-Things (IoT) Systems: Architectures, Algorithms and Methodologies," Springer, 2018.

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### Prerequisite(s)

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EE184302 Introduction to Telecommunication Systems and Networks

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