



National University of Engineering (UNI)
School of Computer Science
Syllabus 2026-I

1. COURSE

CS3P3. Internet of Things (Elective)

2. GENERAL INFORMATION

2.1 Course	: CS3P3. Internet of Things
2.2 Semester	: 9 th Semester.
2.3 Credits	: 3
2.4 Hours	: 1 HT; 4 HP;
2.5 Duration of the period	: 16 weeks
2.6 Type of course	: Elective
2.7 Learning modality	: Face to face
2.8 Prerequisites	: CS3P1. Parallel and Distributed Computing . (8 th Sem)

3. PROFESSORS

Meetings after coordination with the professor

4. INTRODUCTION TO THE COURSE

The Internet of Things (IoT) has transformed how we interact with the physical world by connecting billions of devices. This course explores the architectural foundations of IoT, emphasizing device mobility, wireless communication, and the societal implications of pervasive sensing. Students will analyze the technical challenges of constrained systems and the ethical responsibilities associated with large-scale data collection in interconnected environments.

5. GOALS

- Understand the architecture of IoT systems and the role of mobility in network design.
- Evaluate the societal and ethical impacts of IoT technologies.
- Implement communication protocols for constrained and mobile devices.
- Analyze security risks in the lifecycle of an IoT ecosystem.

6. COMPETENCES

AG-C11) Use of Tools: Applies modern computing tools in problem solving. (Usage)

AG-C09) Design and Development of Solutions: Designs, implements, and evaluates solutions for complex computing problems. (Usage)

7. TOPICS

Unit 1: Soporte de Movilidad (12 hours)	
Competences Expected: AG-C09,AG-C11	
Topics	Learning Outcomes
• Principios de comunicación celular (por ejemplo, 4G, 5G) • Principios de LANs inalámbricas (principalmente 802.11) • Comunicación dispositivo a dispositivo (por ejemplo, comunicación IoT) • Redes inalámbricas multiescalón (por ejemplo, redes ad hoc, oportunistas, tolerantes a retrasos)	• Describir algunos aspectos de comunicación celular como el registro [Describir] • Describir cómo 802.11 soporta usuarios móviles [Describir] • Describir usos prácticos de comunicación dispositivo a dispositivo, así como multiescalón [Describir] • Describir un tipo de red móvil como ad hoc [Describir]
Readings : [HSG17], [BD16]	

Unit 2: Ética, Ley y Sociedad en Seguridad (12 hours)	
Competences Expected: AG-C09,AG-C11	
Topics	Learning Outcomes
• Impactos sociales de los dispositivos del Internet de las Cosas (IoT) y otras tecnologías emergentes en la seguridad y la privacidad Sociedad, ética y la Profesión (SEP)-Privacy,SEP-Security. • Privacidad por diseño (privacy by design) e ingeniería de la privacidad Sociedad, ética y la Profesión (SEP)-Privacy,SEP-Security.	• Analyze the societal impacts of pervasive IoT surveillance [Evaluar]. • Apply privacy-by-design principles to IoT data architectures [Usar].
Readings : [HSG17]	

Unit 3: Aplicaciones en Red (24 hours)	
Competences Expected: AG-C09,AG-C11	
Topics	Learning Outcomes
• Paradigmas de aplicaciones distribuidas (por ejemplo, cliente/servidor, peer-to-peer, nube, edge y fog). Ver también: Computación Paralela y Distribuida (PDC)-Communication, Computación Paralela y Distribuida (PDC)-Coordination • Protocols for constrained networks (CoAP, MQTT, LoRaWAN).	• Definir los principios de denominación, direccionamiento y localización de recursos [Definir] • Analizar las necesidades de demandas específicas de aplicaciones en red [Analizar] • Describir los detalles de un protocolo de capa de aplicación [Describir] • Implementar una aplicación simple cliente-servidor basada en sockets [Implementar]
Readings : [HSG17]	

8. WORKPLAN

8.1 Methodology

Individual and team participation is encouraged to present their ideas, motivating them with additional points in the different stages of the course evaluation.

8.2 Theory Sessions

The theory sessions are held in master classes with activities including active learning and roleplay to allow students to internalize the concepts.

8.3 Practical Sessions

The practical sessions are held in class where a series of exercises and/or practical concepts are developed through problem solving, problem solving, specific exercises and/or in application contexts.

9. EVALUATION SYSTEM

***** EVALUATION MISSING *****

10. BASIC BIBLIOGRAPHY

- [BD16] Rajkumar Buyya and Amir Vahid Dastjerdi. *Internet of Things: Principles and Paradigms*. Morgan Kaufmann, 2016.
- [HSG17] David Hanes, Gonzalo Salgueiro, and Patrick Grossetete. *IoT Fundamentals: Networking Technologies, Protocols, and Use Cases for the Internet of Things*. Cisco Press, 2017.