Content

Course Code	Course Name	Semester	Theory	Practice	Lab	Credit	ECTS
ISI 542	Internet of Things and Industry 4.0	1	3	0	0	3	6

Prerequisites	
Admission Requirements	

Language of Instruction	English
Course Type	Elective
Course Level	Masters Degree
Objective	• Presents the basic principles of "Wireless Communication" from an academic and engineering perspective. • It conceptually and analytically reveals the differences and similarities between the Internet of Things and its predecessor technologies (WSN, M2M, CPS). • It aims to convey Internet of Things design principles from an application perspective. • It conveys the engineering trade-offs behind the approaches that provide the Internet of Things technological infrastructure. • It provides the necessary opportunities for students to internalize the concepts and experimental methods presented in the course through multi-stage projects and assignments.
Content	Week 1: Introduction to the concept of Internet of Things. Possible application areas. Understanding domain-specific requirements and design criteria. Week 2: Comparison of Internet of Things and traditional networks: Energy awareness and application addiction Week 3: Node Features: node hardware, Operating systems, detection modes Week 4: Self-structuring, topology control and repositioning Week 5: Network architecture design for the Internet of Things Week 6: Common access layer in Internet of Things systems, Routing approaches Week 7: Node management framework approaches Week 8: Midterm Week 9: Positioning and Time coordination techniques Week 10: Standards and open source software in the Internet of Things Week 11: Performance evaluation of IoT-based systems through simulation experiments Week 12: Industrial case study Week 13: Advanced topics: E-health applications Week 14: Advanced topics: Industry 4.0

References	- Course Notes -BAHGA, Arshdeep; MADISETTI, Vijay. Internet of Things: A hands-on approach. Vpt, 2014. (Auxiliary Resource) - Dargie, W., Poellabauer, C. "Fundamentals of Wireless Sensor Networks: Theory and Practice (Wireless Communications and Mobile Computing)", 1/e, Wiley, 2010 (Auxiliary Resource)

Theory Topics

Week	Weekly Contents
1	Introduction to the concept of Internet of Things. Possible application areas. Understanding domain-specific requirements and design criteria.
2	Comparison of Internet of Things and traditional networks: Energy awareness and application addiction
3	Node Features: node hardware, Operating systems, detection modes
4	Self-structuring, topology control and repositioning
5	Network architecture design for the Internet of Things
6	Multiple access layer in Internet of Things systems, Routing approaches
7	Node management framework approaches
8	Midterm
9	Positioning and Time coordination techniques
10	Standards and open source software in the Internet of Things
11	Performance evaluation of IoT-based systems through simulation experiments
12	Industrial case study
13	Advanced topics: E-health applications
14	Advanced topics: Industry 4.0