

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	<ul style="list-style-type: none">• 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	<p>Week 1: Introduction to the concept of Internet of Things. Possible application areas. Understanding domain-specific requirements and design criteria.</p> <p>Week 2: Comparison of Internet of Things and traditional networks: Energy awareness and application addition</p> <p>Week 3: Node Features: node hardware, Operating systems, detection modes</p> <p>Week 4: Self-structuring, topology control and repositioning</p> <p>Week 5: Network architecture design for the Internet of Things</p> <p>Week 6: Common access layer in Internet of Things systems, Routing approaches</p> <p>Week 7: Node management framework approaches</p> <p>Week 8: Midterm</p> <p>Week 9: Positioning and Time coordination techniques</p> <p>Week 10: Standards and open source software in the Internet of Things</p> <p>Week 11: Performance evaluation of IoT-based systems through simulation experiments</p> <p>Week 12: Industrial case study</p> <p>Week 13: Advanced topics: E-health applications</p> <p>Week 14: Advanced topics: Industry 4.0</p>

References	<ul style="list-style-type: none"> - 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)
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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