

<b>Internet of Things</b>					
<b>Course Code</b> CIF61070	<b>Student Workload</b> 90 hours	<b>Credits</b> (according to ECTS) 4.5	<b>Semester</b> Sem. 5 & 7	<b>Frequency</b> each odd-semester	<b>Duration</b> 16 meetings
<b>1</b>	<b>Types of courses</b> <i>elective</i>	<b>contact hours</b> 63 hours	<b>independent study</b> 27 hours	<b>class size</b> 40 students	
<b>2</b>	<b>Prerequisites for participation</b> Have completed Computer Network course				
<b>3</b>	<b>Learning outcomes</b> IF-ILO-3 Graduates are able to develop professional careers in the field of computer science based on quality aspects, data-based decision making, be responsible, and make continuous improvements. IF-ILO-7 Mastering the theoretical concept and principles of computer science, especially in the aspect of algorithms, programming, intelligent systems, information management, parallel and distributed computing, information security, human-computer interaction, software engineering, and fundamentals of computer systems and networks. IF-ILO-11 Graduates are able to plan, develop, manage, and analyze the computer network-based system and the services running on top of them by considering the network security aspects.				
<b>4</b>	<b>Subject aims</b> Students are able to explain the basic concepts, architecture and components of IoT-based systems Students are able to explain about communication protocols in an IoT-based system Students are able to explain the basic concepts of computing in an IoT-based system Students are able to explain research issues in an IoT-based system Students are able to apply an IoT-based service in a project-based case study				
<b>5</b>	<b>Teaching methods</b> lectures, case study, class discussion, presentation, practice				
<b>6</b>	<b>Assessment methods</b> assignment, mid-term examination, end-term examination, project evaluation, practical-skill assessment				

7	<b>This module is used in the following degree programs as well</b>
8	<b>Responsibility for module</b>
9	<p><b>Other information</b></p> <ol style="list-style-type: none"> <li>1. Al-fuqaha, A., Member, S., Guizani, M., Mohammadi, M., &amp; Member, S. (2015). Internet of Things : A Survey on Enabling, 17(4), 2347–2376.</li> <li>2. Razzaque, Mohammad Abdur, et al. "Middleware for Internet of Things: A survey." IEEE Internet of Things Journal 3.1 (2016): 70-95.</li> <li>3. Gast, Matthew. 802.11 wireless networks: the definitive guide. " O'Reilly Media, Inc.", 2005</li> <li>4. Journals and research proceedings related to learning materials</li> <li>5. Gomez, Carles, Joaquim Oller, and Josep Paradells. "Overview and evaluation of bluetooth low energy: An emerging low-power wireless technology." Sensors 12.9 (2012): 11734-11753.</li> <li>6. Mekki, Kais, et al. "A comparative study of LPWAN technologies for large-scale IoT deployment." ICT express 5.1 (2019): 1-7.</li> <li>7. Haxhibeqiri, Jetmir, et al. "A survey of lorawan for iot: From technology to application." Sensors 18.11 (2018): 3995.</li> <li>8. Shi, Weisong, et al. "Edge computing: Vision and challenges." IEEE internet of things journal 3.5 (2016): 637-646.</li> <li>9. Yu, Wei, et al. "A survey on the edge computing for the Internet of Things." IEEE access 6 (2017): 6900-6919.</li> <li>10. Botta, Alessio, et al. "Integration of cloud computing and internet of things: a survey." Future generation computer systems 56 (2016): 684-700.</li> <li>11. Mahmoud, Rwan, et al. "Internet of things (IoT) security: Current status, challenges and prospective measures." 2015 10th International Conference for Internet Technology and Secured Transactions (ICITST). IEEE, 2015.</li> <li>12. Khan, Minhaj Ahmad, and Khaled Salah. "IoT security: Review, blockchain solutions, and open challenges." Future Generation Computer Systems 82 (2018): 395-411.</li> <li>13. Lecturer modules</li> </ol>