



**UNIVERSITAS NEGERI YOGYAKARTA**  
**POSTGRADUATE DEPARTMENT OF ELECTRONICS AND**  
**INFORMATICS ENGINEERING EDUCATION**

Jalan Colombo Nomor 1 Yogyakarta 55281  
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**Master of Education in Electronics and Informatics Engineering**

**MODULE HANDBOOK**

Module name:	Internet of Things (IoT)
Module level, if applicable:	Postgraduate
Code:	PTI 8216
Sub-heading, if applicable:	-
Classes, if applicable:	-
Semester:	2 <sup>th</sup>
Module coordinator:	Dr. phil. Ir. Mashoedah, S.Pd., M.T.
Lecturer(s):	Dr. phil. Ir. Mashoedah, S.Pd., M.T.
Language:	English
Classification within the curriculum:	Elective Course
Teaching format / class Hours per week during the semester:	100 minutes lectures and 120 minutes structured activities per week; (2) Field work; (3) 150 minutes lectures and 180 minutes structured activities per week
Workload:	(1) Total workload is 136hours per semester, consists of works 5hours/day in26weekdaysand 6 hours for writing the report; (2) Total workload is 90,67 hours per semester which consists of 100 minutes lectures, 120 minutes structured activities, and 120 minutes self-study per week for 16 weeks
Credit points:	2
Prerequisites course(s):	-
Course Learning Outcome (CLO):	After taking this course the students have ability to: <ol style="list-style-type: none"> <li>1. Able to implement Physical Devices &amp; Controller of IoT;</li> <li>2. Able to create programs for embedded systems.;</li> <li>3. Able to Apply IoT using Arduino, ESP8266 and other embedded system;</li> <li>4. Able to make a connection between physical devices and edge computing;</li> <li>5. Able to develop IoT Apps based on iOS, Android, and the Web;</li> </ol>
Content	The Internet of Think (IoT) course studies the basics of developing an IoT system. The course material discusses how to apply several IoT components, including programming languages, embedded systems, and computer networks. Several programming languages were also discussed to support IoT development. The embedded systems studied include: Arduino, Espruino, and ESP8266. The network studied is computer communication as supporting IoT via cable or wireless.



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Study/exam achievements:	<p>Learning assessment is carried out based on the predetermined course learning outcomes. At least one item in the assessment measures the predetermined course outcome. Several types of assessment are used in this course, such as observation, Quiz, performance tests, work results / products and portfolios.</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th style="width: 5%;">No</th> <th style="width: 15%;">CLO</th> <th style="width: 20%;">Assessment Object</th> <th style="width: 20%;">Assessment Technique</th> <th style="width: 10%;">Weight</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td>CLO1, CLO2, CLO3</td> <td>Product, quiz result, paper</td> <td>Assignment, Quiz</td> <td style="text-align: center;">60%</td> </tr> <tr> <td style="text-align: center;">2</td> <td>CLO4, CLO5</td> <td>Product, quiz result, paper</td> <td>Assignment, Quiz</td> <td style="text-align: center;">40%</td> </tr> </tbody> </table>	No	CLO	Assessment Object	Assessment Technique	Weight	1	CLO1, CLO2, CLO3	Product, quiz result, paper	Assignment, Quiz	60%	2	CLO4, CLO5	Product, quiz result, paper	Assignment, Quiz	40%
No	CLO	Assessment Object	Assessment Technique	Weight												
1	CLO1, CLO2, CLO3	Product, quiz result, paper	Assignment, Quiz	60%												
2	CLO4, CLO5	Product, quiz result, paper	Assignment, Quiz	40%												

Forms of media:	CD Projector, Laptop / Computer, White Board
Literature	<ol style="list-style-type: none"> <li>1) Bell C., Beginning Sensor Networks with Arduino and Raspberry Pi, Apress, 2014.;</li> <li>2) Schwartz M., Internet of Things with ESP8266, Packt Publishing Ltd, 2016.;</li> <li>3) Williams G.F., Making Things Smart: Easy Embedded JavaScript Programming for Making Everyday Objects into Intelligent Machines, Maker Media, Inc., 2017.;</li> <li>4) Huimin Lu; Cognitive Internet of Things: Frameworks, Tools and Applications; Springer International Publishing; 2020;</li> <li>5) Mohammad Ali Jabraeil Jamali, Bahareh Bahrami, Arash Heidari, Parisa Allahverdizadeh, Farhad Norouzi; Towards the Internet of Things: Architectures, Security, and Applications; Springer International Publishing; 2020;</li> <li>6) Maryam Farsi, Alireza Daneshkhah, Amin Hosseinian-Far, Hamid Jahankhani; Digital Twin Technologies and Smart Cities; Springer International Publishing; 2020;</li> <li>7) Valentina E. Balas, Vijender Kumar Solanki, Raghvendra Kumar, Md. Atiqur Rahman Ahad; A Handbook of Internet of Things in Biomedical and Cyber Physical System; Springer International Publishing; 2020;</li> <li>8) Srikanta Patnaik; New Paradigm Of Industry 4.0: Internet Of Things, Big Data &amp; Cyber Physical Systems; Springer; 2020;</li> </ol>



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	9) Sheng-Lung Peng, Souvik Pal, Lianfen Huang; Principles Of Internet Of Things (IoT) Ecosystem: Insight Paradigm; Springer; 2020; 10) Valentina E. Balas, Raghvendra Kumar, Rajshree Srivastava; Recent Trends and Advances in Artificial Intelligence and Internet of Things; Springer International Publishing; (2020);
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**PLO and CLO mapping**

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
CLO1				✓	✓					✓
CLO2				✓	✓					✓
CLO3				✓	✓					✓
CLO4				✓	✓					✓
CLO5				✓	✓					✓