FI589 Microprocessor Application

Module name:	Microprocessor Application	
Module level, if applicable:	Undergraduate	
Code:	FI589	
Sub-heading, if applicable:	-	
Classes, if applicable:	-	
Semester:	7th	
Module coordinator:	Waslaluddin	
Lecturer(s):	Waslaluddin	
Language:	Bahasa Indonesia	
Classification within the curriculum	Elective course	
Type of Teaching	Contact hours per week during the semester	Class Size
1. Lecture (conceptual, contextual and problem-solving approaches through expository, discussions, experiment and presentation). 2. Structured activities (assignments based on conceptual, contextual and problem-solving approaches) 3. Self-study (project)	2 hours 30 minutes	20
Workload:	The total workload is 136 hours/8160 minutes (4.8 ECTS) per semester, consisting of 35 hours/2100 minutes lectures (1.24 ECTS), 42 hours/2520 minutes structured activities (1.48 ECTS) and 42 hours/2520 minutes self-study (1.71 ECTS) per week for 14 weeks, 17 hours/1020 minutes for two exams (0.6 ECTS).	
Credit points:	4.8 ECTS	
Pre-requisites course(s):	FI241 Analog Electronics, FI441 Digital Electronics, FI242 Algorithm and Programming	
Course Learning Outcomes (CLO):	After taking this course the students have ability to: CLO1. Describe microprocessor technology as a computational and control instrument CLO2. Explain microcontroller technology as the basis of sensors and control instruments CLO3. Apply microprocessor technology as a computing and control instrument CLO4. Apply microcontroller technology as the basis for sensor and control instruments	

<table>
<tr><td></td><td>CLO5. Apply microprocessor technology as a computing and control instrument
CLO6. Apply microcontroller technology as the basis for sensor and control instruments
CLO7. Apply microprocessor technology as a computational and control instrument
CLO8. Apply ICT in microcontroller technology as the basis of sensors and control instruments
CLO9. Analyse of sensors and actuators valid for microprocessor technology as a computational and control instrument
CLO10. Analyse of valid sensors and actuators for microcontroller technology as the basis for control instruments
CLO11. Report the results of the manufacture of micro-processor-based sensor-actuator technology products
CLO12. Report the results of the manufacture of sensor-actuator technology products based on the r microcontroller</td></tr>
<tr><td>Content:</td><td>After completing this course, students are expected to have factual, conceptual, and procedural knowledge and insight to adapt to follow-up lectures on Instrumentation studies, especially microprocessors and microcontrollers as the basis for control instruments. This course discusses (1) understanding and history of microprocessor development, (2) microprocessor structure and working principles, number system and language in microprocessors, (3) Programming and downloaders, (4) LED control program practice, stepper motors and traffic lights, Wired and wireless communication (5) Microcontroller and Minimum system (6) Microcontroller-based Physics Instrument System Project. The learning process uses the problem-solving method, recitation, demonstration and discussion, with electronic presentation application media facilities, microprocessor and microcontroller practical kits with a computer as a tool.</td></tr>
<tr><td>Study/exam achievements:</td><td>The final mark will be weight as follow:
<table>
<tr><th>No</th><th>CLO</th><th>Assessment Object</th><th>Assessment Techniques</th><th>Weight</th></tr>
<tr><td>1</td><td>CLO1 – CLO10

CLO11-CLO12</td><td>Subject specific competences:
a. Individual assignments
b. Exam
- Mid exam
- Final exam
c. Experiment report
d. Project report
e. Presentation</td><td>
Written

Written Test
Written Test
Written
Written
Performance</td><td>
10 %

25%
25%
10%
20%
10%</td></tr>
<tr><td colspan="4">Total</td><td>100%</td></tr>
</table></td></tr>
<tr><td>Forms of media:</td><td>Board, LCD Projector, Laptop/Computer, Demonstration Equipment Package, LMS</td></tr>
<tr><td>Literature:</td><td>1. Hendry, Iain. (2019). 34 Arduino Sensor Projects. Kindle Edition.
2. Manual Kentac 800Z MK2. Practice program of Z80 CPU. Showadengyosha Co., LTD
3. Kentac PCP User's Manual. Showadengyosha Co., LTD
4. Malvino, AP, Brown, JA (2011) Digital Principles and Application, 7th-ed. McGraw-Hill International Editions</td></tr>
</table>

	5. Bolton, W. (2015). *Instrumentation and Control Systems*, *2nd-ed*. Elsevier Ltd. 6. Waslaluddin. (2019). *Practical Instructions for Using Kentack and Minimum Microcontroller Systems*. Unpublished

PLO and CLO mapping

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10	PLO11	PLO12
CLO1				√								
CLO2				√								
CLO3					√							
CLO4					√							
CLO5					√							
CLO6					√							
CLO7					√							
CLO8					√							
CLO9					√							
CLO10					√							
CLO11					√							
CLO12					√							