## MODULE HANDBOOK DESCRIPTION

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| Module designation | Programmable Logic Control |
| Code | **FBA0008** |
| Semester(s) in which the module is taught | 6 / third year |
| Person responsible for the module | Sudi Mariyanto Al Sasongko, S.T., M.T. |
| Language | Indonesian |
| Relation to curriculum | Elective for Electrical Power System Engineering |
| Teaching methods | Lectures, Small Group Discussion, case base method |
| Workload (incl. contact hours, self-study hours) | Contact minutes every week, each week of the 16 weeks/semester: <br><br> ● Lectures: 2 x 50 minutes. <br> ● Exercises and assignments: 2 x 60 minutes. <br> ● Self-learning: 2 x 60 minutes. <br> Total study hours = 5 hours 40 minutes/week |
| Credit points | 2 (~ 3,2 ECTS) |
| Required and recommended prerequisites for joining the module | - Logic Circuit (FBS1107) <br> - Logic Circuit Laboratory (FBS1218) <br> - Basic Programming (FBS1215) |
| Module objectives/ intended learning outcomes | Students are able to analyze the development process of industrial automation | PLO3 |
| | Students are able to analyze the basis of logic and sequential programming | PLO3 |
| | Students are able to analyze **the function of the PLC hardware** | PLO4 |
| | Students are able to analyze the function of PLC input components and PLC output components | PLO4 |

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| | Students are able to implement and build PLC ladder programming | PLO4 |
| | Students can design programs based on the internal functions of timer, counter, holding, interlock | PLO4 |
| | Students are able to build RTC-based PLC programs | PLO5 |
| | Students are able to build interconnection of input and output module | PLO5 |
| Content | 1. Introduction to Industrial Automation<br>2. Basic Concepts of Logic and Sequential Programming<br>3. PLC Hardware Components<br>4. PLC input and output equipment<br>5. Basic principles of ladder diagram programming<br>6. PLC Internal Functions (Timer, Counter, Holding, Interlock)<br>7. Real Time Clock implementation<br>8. Logic Functions and Arithmetic Functions<br>9. Application for Interconnection of Digital Input and Output modules<br>10. Application for Interconnection of Analog Input and Output modules | |
| Examination forms | - Written case study<br>- Essay midterm and final test | |
| Study and examination requirements | The final grade in the module is composed of:<br>1. Attendance assessment : 5 %<br>2. Case I assessment : 15 %<br>3. Case II assessment : 15 % Case III assessment : 20 %<br>4. Written Midterm assessment : 20 %<br>5. Written Final assessment : 20 %<br>Students mush have a final grade of 65% or higher to pass | |
| Reading list | 1. Bolton, W., 2015, Programmable Logic Controller, Sixth Edition.<br><br>2. Hackworth, J.R. and Hackworth Jr. F. D., ___, Programmable Logic Controller: Programming Method and Applications.<br><br>3. Uzam, M., 2014, Building Programmable Logic Controller With a PIC16F648A Microcontroller. | |