



MODULE HANDBOOK DESCRIPTION

Module designation	Digital Controls Engineering	
Code	FBB4116	
Semester(s) in which the module is taught	7 / forth year	
Person responsible for the module	Supriono, ST., MT.	
Language	Indonesian	
Relation to curriculum	Compulsory for Electronics Discipline	
Teaching methods	Lectures, small group discussion, case base method.	
Workload (incl. contact hours, self-study hours)	<p>Contact minutes every week, each week of the 16 weeks/semester:</p> <ul style="list-style-type: none"> • Lectures: 2 x 50 minutes • Exercises and Assignments: 2 x 60 minutes • Private study: 2 x 60 minutes. <p>total study hours = 5 hours 40 minutes/week</p>	
Credit points	2 SKS (~ 3.2 ECTS)	
Required and recommended prerequisites for joining the module	<ul style="list-style-type: none"> - Basic Electronics (FBS2125) - Microprocessor System (FBS2235) 	
Module objectives/intended learning outcomes	1. Students are able to analyse ADC (Analogue to Digital Conversion) and DAC (Digital to Analogue Conversion), Interrupts and Data Communications on a Microcontroller and a Microprocessor	PLO3
	2. Students are able to design Digital Control system on a Microcontroller and a Microprocessor.	PLO4
	3. Students are able to carry out controlling a BLDC Motor using a Microcontroller or a Microprocessor	PLO5
Content	<ol style="list-style-type: none"> 1. Introduction on Digital Control (PLO4) 2. Overview Microcontroller and Microprocessor (PLO4) 3. Working Principle on ADC (Analogue to Digital Conversion) and DAC (Digital to Analogue Conversion) (PLO3) 4. Interrupts on Microcontroller and Microprocessor (PLO3) 5. Data Communications on Digital Control (PLO3) 6. Microcontroller Application on BLDC Motor (PLO5) 	

Examination forms	<ul style="list-style-type: none"> - Projects - Midterm and final test
Study and examination requirements	<p>The final grade in the module is composed of:</p> <ul style="list-style-type: none"> a. Projects: 70% b. Midterm assessment: 15% c. Final assessment: 15% <p>Students must have a final grade of 65% or higher to pass</p>
Reading list	<ol style="list-style-type: none"> 1. Dogan Ibrahim, Microcontroller Based Applied Digital Control, Jhon Wiley and Sons. Ltd 2. Slobodan N. Vukosavić, Digital Control of Electrical Drives, Springer 3. AVR ATmega Datasheet, Atmel 4. Raspberry Pi Pico Datasheet, Raspberry Pi Ltd