



MODULE HANDBOOK DESCRIPTION

Module designation	Interface Engineering And Embedded Systems	
Code	FBB3213	
Semester(s) in which the module is taught	6/third year	
Person responsible for the module	I Made Budi Suksmadana, S.T., M.T.	
Language	Indonesian/English	
Relation to curriculum	Concentration Elective for Electronics 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: <ul style="list-style-type: none"> ● Lectures: 3 x 50 minutes ● Exercises and Assignments: 3 x 60 minutes ● Self-study: 3 x 60 minutes. Total study hours = 8 hours 30 minutes/week.	
Credit points	3 SKS (~ 4.8 ECTS)	
Required and recommended prerequisites for joining the module	- FBS1215 Basic Programming	
Module objectives/intended learning outcomes	1. Students are able to specify the types of Arduino, specify the basic functions of Arduino programming, specify the types of sensors as inputs that can be connected to Arduino, specify the types of output (Electromechanical) that can be controlled by Arduino, detail the types of wireless control with Arduino.	PLO3

	2. Students are able to design systems based on the Arduino Board, design Arduino systems using various types of sensors, design controllers using the Arduino Board, design wireless control systems using the Arduino Board.	PLO4
	3. Students are able to build an Air Quality Monitor system using Arduino, build a Fire-Fighting Robot Using Arduino, build an Intelligent Lock System Using Arduino.	PLO5
Content	Getting Started with Arduino (Arduino Variants, Install the Drivers, Arduino IDE). The Basic Functions (Structure, Digital I/O Functions, Analog I/O Functions, Advanced I/O Functions, Timer Functions , Communication Functions, Interrupt Functions, Math Functions). Using Sensors with the Arduino (Light Sensitive Sensors, Temperature Sensors, Temperature and Humidity Sensor, Line-Tracking Sensor, Ultrasonic Sensors, Digital Infrared Motion Sensor, Joystick Module, Gas Sensor, Hall Sensor, Color Sensor, Digital Tilt Sensor, Triple Axis Acceleration Sensor, Analog Sound Sensor, Voice Recognition Module, Digital Vibration Sensor, Flame Sensor, Capacitive Touch Sensor). Electromechanical Control Using the Arduino (DC Motor, Stepper Motor, Servo Motor,Hardware Setting). Wireless Control Using the Arduino (Infrared Transmitter and Receiver Module, 2.4G Wireless Radio Frequency Module, Bluetooth Module, GSM/GPRS Module, Wi-Fi Module)	
Examination forms	<ul style="list-style-type: none"> - Written case study - 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. Attendance: 10% b. Case assessment: 3 x 15% = 45% c. Midterm assessment: 20% d. Final assessment: 25% <p>Students must have a final grade of 65% or higher to pass</p>	

Reading list	<ol style="list-style-type: none"><li data-bbox="548 197 1391 317">1. T. Pan and Y. Zhu, <i>Designing Embedded Systems with Arduino A Fundamental Technology for Makers</i>. Springer Nature Singapore Pte Ltd., 2018.<li data-bbox="548 327 1391 405">2. M. Banzi, <i>Getting Started with Arduino</i>. O'Reilly Media, Inc., 2011.<li data-bbox="548 415 1391 455">3. M. Margolis, <i>Arduino Cookbook</i>. O'Reilly Media, Inc., 2011.
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