



Module A	Title of the module: INTRODUCTION		
Prerequisites:	<ul style="list-style-type: none"> - Basic knowledge of electronic circuits 		
Included units:	<ul style="list-style-type: none"> - UNIT 1: FIRST PROGRAMS - UNIT 2: DIGITAL I/O AND STOPS - UNIT 3: EXPRESIONS, DELAYS AND SOUND - UNIT 4: TAKE DECISIONS AND CONTROL FUNCTIONS - UNIT 5: ANALOG SIGNALS - UNIT 6: LCD SCREENS 		
<i>Learning Outcomes:</i>	<i>Knowledge</i>	<i>Skills</i>	<i>Competence</i>
	He/she knows...	He/she is able to ...	He/she is able to... (responsible)
	<ul style="list-style-type: none"> - What is arduino, how it works and where it can be used - What is the basic structure of an arduino program - Arduino's program statements 	<ul style="list-style-type: none"> - Understand arduino programs - Write arduino programs - Assemble prototype circuits 	<ul style="list-style-type: none"> - Design small scale arduino systems - Develop small scale arduino systems
	<ul style="list-style-type: none"> - How interrupts work in arduino 	<ul style="list-style-type: none"> - Analyze when to use interrupts in arduino programs 	<ul style="list-style-type: none"> - Introduce interrupts in arduino programs
	<ul style="list-style-type: none"> - Diference between analog and digital signals in arduino 	<ul style="list-style-type: none"> - Use analog and digital signals with arduino 	<ul style="list-style-type: none"> - Combine analog and digital signals with arduino
	<ul style="list-style-type: none"> - How to use libraries with arduino 	<ul style="list-style-type: none"> - Introduce libraries in arduino programs 	<ul style="list-style-type: none"> - Simplify arduino programs using libraries
	<ul style="list-style-type: none"> - How to display data with arduino 	<ul style="list-style-type: none"> - Use different types of displays with arduino 	<ul style="list-style-type: none"> - Select the best type of display to use
Reference to EQF:	1 credit		
Assessment:	The assessment will be done by daily observation		



Module B	Title of the unit: SENSORS		
Prerequisites:	- Introduction module		
Included units:	- UNIT 7: INFRARED SENSORS - UNIT 8: OTHER SENSORS		
<i>Learning Outcomes:</i>	<i>Knowledge</i>	<i>Skills</i>	<i>Competence</i>
	He/she knows...	He/she is able to do...	He/she is able (responsible) to...
	<ul style="list-style-type: none"> - Different types of sensors - How different types of sensors work - How different types of sensors connect - How to make custom libraries 	<ul style="list-style-type: none"> - Interface Arduino with different kinds of sensors - Programming with events - Programming of a simple library 	<ul style="list-style-type: none"> - Select the best type of sensor for the intended purpose - Monitoring specific situations - Recognize when you need to create a specific library
	<ul style="list-style-type: none"> - Recognize different types of accelerometers 	<ul style="list-style-type: none"> - Interfacing different accelerometers with Arduino 	<ul style="list-style-type: none"> - Select the best type of accelerometer for the intended purpose
	<ul style="list-style-type: none"> - Recognize different types of humidity sensors 	<ul style="list-style-type: none"> - Interfacing different humidity sensors with Arduino 	<ul style="list-style-type: none"> - Select the best type of humidity sensors for the intended purpose -
	<ul style="list-style-type: none"> - Recognize different types of temperature sensors 	<ul style="list-style-type: none"> - Interfacing different temperature sensors with Arduino 	<ul style="list-style-type: none"> - Select the best type of temperature sensors for the intended purpose -
Reference to EQF:	1 credit		
Assessment:	The assessment will be done by daily observation		



Module C	Title of the unit: ACTUATORS		
Prerequisites:	- Introduction module		
Included units:	<ul style="list-style-type: none"> - UNIT 9: RELAYS - UNIT 10: DRIVING MOTORS - UNIT 11: RC-SERVO MOTOR CONTROLS 		
<i>Learning Outcomes:</i>	<i>Knowledge</i>	<i>Skills</i>	<i>Competence</i>
	He/she knows...	He/she is able to ...	He/she is able (responsible) to ...
	- Recognize different types of relays	- Interface different relays with Arduino	- Select the best type of relays for the intended purpose
	- Different kinds of power requirements	- Recognize different power requirements for the equipment	- Manage the power requirements of specific applications
	- Recognize different types of motors	- Interface different motors with Arduino	- Select the best type of motor for the intended purpose
	- How different types of motors work <ul style="list-style-type: none"> • RC servo motor • Stepper motor • DC (Permanent Magnet) motor 	- Interface different types of motors with Arduino	- Apply different types of motors in mechatronic projects
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Reference to EQF:	1 credit		
Assessment:	The assessment will be done by daily observation		



Module D	Title of the module: COMMUNICATIONS		
Prerequisites:	- Introduction module		
Included units:	<ul style="list-style-type: none"> - UNIT 12: COMMUNICATIONS - UNIT 13: I2C BUS - UNIT 14: COMMUNICATION PROTOCOLS 		
<i>Learning Outcomes:</i>	<i>Knowledge</i>	<i>Skills</i>	<i>Competence</i>
	He/she knows...	He/she is able to...	He/she is able (responsible) to...
	<ul style="list-style-type: none"> - Basic principles of serial communications 	<ul style="list-style-type: none"> - Establish serial communications between Arduino and other devices 	<ul style="list-style-type: none"> - Enable the exchange of data between micro-controllers
	<ul style="list-style-type: none"> - Basic principles of communication protocols <ul style="list-style-type: none"> • Bluetooth • Ethernet • Wifi 	<ul style="list-style-type: none"> - Establish wired or wireless communication between Arduino and other devices using higher-level communication protocols 	<ul style="list-style-type: none"> - Enable the exchange of data between micro-controllers and various types of applications (including web and mobile applications)
Reference to EQF:	1 credit		
Assessment:	The assessment will be done by daily observation		