BLUE TEmPLATE
BLUE TEch PArTnership Education
Cod. 2017-1-IT02-KA201-036870
Co-funded by the Erasmus+ Programme of the European Union

Project: BLUE TEmPLATE
BLUE TEch PArTnership Education

Training Program

Profile:
Metalworking, Electronics and Precision – M.E.P.

Progetto BLUE TEmPLATE
BLUE TEch PArTnership Education

COURSE: Metalworking, Electronics and Precision – M.E.P.

MECHATRONIC MODULE		
Lesson contents	Mechanics: Static equilibrium of bodies, stresses and resistance of materials Technology: Material properties, metal cutting, processing cycle and ISO cnc programming.	
Abilities	Ability to solve binding bodies static balance, to break down composite stresses into simple stresses and assess the relevant resistance. Ability to interpreter a material certificate, use knowledge about metal cut to choose the machine tool working parameter. Ability to compile the ISO programs knowing the CNC programming fundamentals.	
Knowledge	Forces, moments and vectors. Unit of measurement of the international system and basic metrology. Fundamentals on the different materials.	
Skills	Understandngi the criteria for checking material resistance Understanding the development and sequence of the machining phases of a mechanical part. Understanding the programming logic of a CNC machine.	
Lessons time	13 hours	
Training methods	☑ class lesson □ debriefing ☑ practice/exercises ☑ training □ problem solving	☑ laboratory □ project work □ simulation – virtual Lab □ brain – storming □ Others (specify) …….
Means, tools and supporting material	☑ laboratory equipment: ○ Testing machines ○ CNC machine tool ☑ lessons notes □ virtual - lab	□ books □ multimedia □ tools for electronic calculation □ measuring tools □ Others (specify) ……..
Tests	☑ structured test □ semi-structured test □ laboratory test □ report	□ observation tabs □ problem solving □ graphic works □ Others (specify) ……..

ROBOTICS MODULE WITH KINEMATICS AND DYNAMIC FUNDAMENTALS	
Lessons contents	Robotics: components, kinematics and programming. Material point kinematics and dynamics
Abilities	Ability to choose the sensors suitable to the most common situations, ability to choose an engine suitable to the required purpose, ability to write a simple programme in Visual and NXC languages explained during class lessons.
Knowledge	Sensors characteristics, engine characteristics, laws of the material point kinematics, laws of the material point dynamics
Skills	Understanding the logic of a robot design and construction Understanding the logic of a robot programming, also from the movement mechanics point of view
Lessons time	13 hours

Training methods	☑ class lesson □ debriefing □ practice/exercises ☑ training □ problem solving	☑ laboratory □ project work ☑ simulation – virtual Lab □ brain – storming □ Other (*specify*)…….
Means, tools and supporting material	☑ laboratory equipment: robot ○ PC ○ ……. ☑ lessons notes □ virtual - lab	□ books □ multimedia □ tools for electronic calculation □ measuring tools □ Other (*specify*)…….
Tests	☑ structured test □ semi-structured test □ laboratory test □ report	□ observation tabs □ problem solving □ graphic works □ Other (*specify*)…….

PRECISION ELECTRONICS AND ELECTRONICS MODULE		
Lessons contents	Electronics: components, circuits and electronic devices. Sensors, transducers and classification of programming typologies and their exploitation in electronics.	
Abilities	Apply the physics principles to the study of components, circuits end electrical and electronic linear and nonlinear devices. Ability to choose the sensors suitable to the most common situations. Design of different control and data acquisition systems.	
Knowledge	Electrical quantities. Basic laws of the EL and ET. Solution method for DC networks and in approx. Sensors and Transducers. Basic OpAmP configuration. Combinational and sequential electronics. Circuits and devices for control and interfacing.	
Skills	Understanding the design logic. Understanding the programming logic.	
Lessons time	12 + 12 =24 HOURS	
Training methods	☑ class lesson □ debriefing □ practice/ exercises ☑ training □ problem solving	☑ laboratory □ project work ☑ simulation – virtual Lab □ brain – storming □ Others (specify) ……..
Means, tools and supporting material	☑ laboratory equipment: power supply, oscilloscope, electric tester ○ PC ☑ lessons notes ☑ virtual - lab	□ books □ multimedia □ tools for electronic calculation ☑ measuring tools □ Others (specify) ……..
Tests	☑ structured test □ semi-structured test □ laboratory test □ report	□ observation tabs ☑ problem solving □ graphic works □ Others (specify) ……..