

Training Component (socio-cultural / cientific / Tecnological)	SUBJECT	Year and hours & ECVETS	Learning Outcomes / Essential Learning	Grade	A	B	C	D	E	F	G	H	I	J	To be developed in / at (school / workplace)		
Technological	Graphical Interpretation	1 st (115h = 7 ECTS credits)	Determines the forms and characteristics of the products to be manufactured:														
			a)Interprets the symbols reperesented in the manufacturing plans. b)Analyses the charaterstics of the products to be manufactured c)Shows thoroughness in the identification of symbols and characteristics			X		X		X							
			Identifies whether or not the product to be manufactured supports specific forms and dimensions:														
			a) Interprets the technical information included in the manufacturing plans. b) Analyses the technical information included in the manufacturing plans. c)Shows proactivity in determining the manufacturing feasibility of the product					X	X		X						
			Sketches tools to be used during the making processes:														
			a)Develops the sketches and constructive solutions in each case b) defines the constructive solutions in each case. c)Demonstrates teamwork capacity				X	X	X								

		<p>Interprets sketches of machine and equipment automation:</p> <p>a) identifies the represented elements in pneumatic, hydraulic, electric, programmable and non programmable installations .</p> <p>b) Analyses the sketches of machine and equipment automation</p> <p>c) Shows thoroughness in the interpretation of sketches</p>														
Definition of the		<p>Determines machining processes through stock removal, abrasion, electrical discharge and special procedures:</p> <p>a) Analyses the sequence and variables of the process.</p> <p>b) Justifies the sequence and variables of the process</p> <p>c) Resolves satisfactorily the problems raised in the development of its activity.</p>														
		<p>Determines shaping processes:</p> <p>a) Analyses the sequence and variables of the process.</p> <p>b) Justifies the sequence and variables of the process</p> <p>c)Shows proactivity, thoroughness and team work capacity</p>														
		<p>Determines fitting processes:</p> <p>a) Analyses the sequence and variables of the process.</p>														
		<p>a) Analyses the sequence and variables of the process.</p>														

Technological	Processes of Machining, Shaping and Fitting	1 st (165h = 10 ECTS credits)	<p>b) Justifies the sequence and variables of the process</p> <p>c) Shows proactivity, thoroughness and team work capacity</p>			X	X	X			X						
			Determines machining, shaping and fitting costs:														
			a) Identifies the costs of the different manufacturing solutions														
			b) Analyses the costs of the different manufacturing solutions														
			c) Resolves satisfactorily the problems raised in the development of its activity.														
			Distributes machinery and equipment throughout the plant:														
			a) Relates their physical position with the manufacturing process.														
			b) Defines the best solutions in each case.														
			c) Resolves satisfactorily the problems raised in the development of its activity.														
			Organises the manufacturing processes implementation:														
			a) Interpretes the specifications of the product and process sheets.														
			b) Designs the specifications of the product and process sheets.														
			c) Shows proactivity, thoroughness and team work capacity														

	verification	ECRS credits)	c)Shows proactivity, thoroughness and team work capacity															
			Calibrates measuring tools:															
			a) Describes their systematic error-correcting procedures. b) Justifies whether is required or not to calibrate measuring tools c) Resolves satisfactorily the problems raised in the development of its activity.					X										
			Determines the quality assurance of products and process stability:															
			a) Calculates statistical data for the monitoring of the product and process. b) Justifies the sequence and variables of the process c) Resolves satisfactorily the problems raised in the development of its activity.		X		X			X								
			Defines actions to make the implementation and maintenance of quality assurance systems easier:															
			a) Interprets the quality assurance systems basic concepts and factors b) Propose actions for the easier implementation of quality assurance solutions c)Shows proactivity, thoroughness and team work capacity					X										

		<p>Participates in the development of a risk prevention plan in a small enterprise:</p> <p>a) Identifies the responsibilities of all agents involved.</p> <p>b) Propose risks prevention actions based on the characteristics of the company</p> <p>c) Shows proactivity, thoroughness and teamwork capacity</p>				X	X									
		<p>Applies protection and prevention measures:</p> <p>a) Interpretes risk situations in the labour setting of the Higher Technician in Mechanical Production Scheduling.</p> <p>b) Analyses how the protection and prevention measures will control or prevent the risk situations</p> <p>c) Resolves satisfactorily the problems raised in the development of its activity.</p>				X	X			X						
		<p>Prepares the programs of numerical control:</p> <p>a) Analyses the different types of programming.</p> <p>b) Applies the different types of programming.</p> <p>c) shows proactivity, thoroughness and team work capability</p>				X	X									
		<p>Organises his/her tasks during the machining process:</p>														

		<p>Prepares and fine-tunes machinery, equipment and tools that intervene in the manufacturing and fitting process:</p>													
		<p>a) Applies the required techniques.</p> <p>b) Applies the required procedures.</p> <p>c) shows proactivity, thoroughness and team work capability</p>					X								
		<p>Measures dimensions:</p> <p>a) Verifies characteristics of the manufactured parts.</p> <p>b) Follows established instructions of the control plan.</p> <p>c) shows proactivity, thoroughness and team work capability</p>					X	X							
		<p>Analyses the characteristics of the dies, to define their shape, dimensions and constructive solutions:</p> <p>a) Identifies the types, characteristics and construction parts of the dies for sheet metal forming.</p> <p>a) Identifies the types and characteristics of the presses used in the stamping of sheet metal.</p> <p>b) Analyses and manages the existing operations in the sheet metal forming.</p>				X	X								

		<p>c) shows proactivity, thoroughness and team work capacity</p>																
		<p>Performs the complete study of transformation of a metallic piece, analysing its feasibility and fabricability:</p>																
		<p>a) Identifies the characteristics of the piece to be shaped, analysing its physical, chemical, mechanical and technological properties.</p>																
		<p>a) Analyses the production characteristics to obtain the piece, taking into account the press, quality, cycles, etc. data.</p>																
		<p>b) Carries out the study of the band or plane method, defining the different phases for obtaining the final piece, taking into account the material consumption, phases, feasibility, etc.</p>				X	X											
		<p>b) Analyses the virtual behaviour of the formation of the sheet, identifying possible risk areas and acting accordingly.</p>																
		<p>b) Develops the starting geometry of the piece in CAD system for the die design.</p>																
		<p>c) shows proactivity, thoroughness and team work capability</p>																

Technological

Die-design in
sheet metal
forming

3rd (250h = 16
ECTS Credits)

Performs the necessary calculations for the dimensioning of the components of the die from the technical data of the piece and the die:

- a) Identifies and calculates the existing efforts during the process of forming sheet metal in the components of the die.
- b) Makes dimensions of the design of the die components, applying the different formulas, tables and standards that are used in die-cutting.
- b) Identifies elements exposed to wear and/or breakage, and defines preventive measures to increase life or rapid change.
- a) Describes the materials of the elements of the die that require lubrication, taking into account their physical or chemical compatibility.
- b) Selects normalised elements, according to the submitted stresses and to the characteristics provided by the manufacturer.
- b) Carries out the calculation of the tool in compliance with current regulations regarding the safety of people, equipment, facilities and the environment.

X

X

forming

Designs dies with the help of CAD computer applications for subsequent manufacturing:

a) Identifies the rules of 3D graphic representation for the design of dies.

a) Meets the technical specifications required in the die design notebook.

b) Takes into account in the design the requirements for obtaining pieces by molding.

b) Proposes a constructive solution of the die duly justified from the point of view of the feasibility of manufacture and profitability and of the technical specifications.

a) Identifies the materials and treatments, according to technical and production aspects for each component of the die.

b) Selects construction and standard elements, according to technical specifications, in the design of the die.

b) Manages the information related to the design in an organized and clean manner, for its subsequent management in the network.

c) Takes into account the necessary elements in the design of dies, for the subsequent transport and handling according to safety regulations.

X

X

X

	<p>c) Resolves satisfactorily the problems raised in the development of its activity.</p>														
	<p>Prepares the necessary technical documentation for the purchase, manufacture and assembly of the die:</p>														
	<p>a) Identifies the most usual materials and treatments used in die-making, based on production and technical aspects.</p>														
	<p>b) Defines the list of materials for the purchase of die elements.</p>														
	<p>b) Prepares the necessary documentation for the manufacture and assembly of the die elements.</p>	X			X	X									
	<p>b) Makes the 2D releases of the construction elements for their manufacture.</p>														
	<p>c) Manages the technical documentation in an organized and clean manner, for subsequent management in digital format in the cloud.</p>														
	<p>Applies techniques of design verification of dies, to ensure the quality of the product and compliance with the rules of prevention of occupational risks and environmental protection:</p>														
	<p>a) Analyses and checks the 3D design to detect problems during the manufacture of the die and/or in the production phase.</p>					y	y								

		<p>b) Launches the purchase and manufacturing orders.</p> <p>b) Calculates the cost of the die.</p>														
		<p>Controls production by relating the techniques for control with the production requirements of a die:</p> <p>a) Identifies the causes that cause deviations in the production programs of the dies.</p> <p>b) Calculates indicators of the production process of a die (production, yield, etc.).</p> <p>b) Proposes solutions in case of inefficiencies and for the adjustment of the production program of a die.</p> <p>b) Interprets and elaborates tracking and control reports on the manufacture of dies.</p>				X	X									
		<p>Elaborates programs of numerical control (CNC) and computer-aided programming (CAM), analyzing the specifications of the work process:</p> <p>a) Configures the appropriate environment according to the machine to be used.</p> <p>a) Describes the different machining strategies.</p> <p>c) Defines the tools and introduces the technological data.</p> <p>a) Identifies numeric control programming languages.</p>					X	X								

Technological	Planning and manufacture of the components of the die	3rd (180h = 11 ECTS credits)	<p>b) Carries out the program according to the specifications of the programming manual of the numerical control used.</p> <p>b) Verifies the program simulating machining on the computer.</p> <p>b) Corrects the errors detected in the simulation.</p> <p>b) Carries out the post-processing of the CAM program for the numerical control that will be used.</p>																
			<p>Operates machine tools for cutting machining of the components of dies, meeting the specifications of the process and obtaining the required quality.</p>																
			<p>a) Describes in the different materials used the phenomenon of chip formation, and the causes that cause them.</p> <p>a) Describes the wear phenomenon of the tools, indicating tolerable types and limits.</p> <p>b) Applies the operative technique necessary to execute the process.</p> <p>b) Checks the characteristics of the mechanized and assembled parts.</p>					X	X										

		<p>b) Relates the most frequent errors of final form in the pieces to the mooring and alignment defects.</p> <p>a) Identifies if the deficiencies are due to tools, conditions and parameters of cutting, machines or material.</p> <p>a) Corrects deviations of the process acting on the machine or tool</p>																
		<p>Prepares the machine tools for the machining by chip removal of the components of dies, using the equipment and necessary means from documentation and technical specifications.</p>																
		<p>a) Analyses the manufacturing process of the die, according to the type of machining (orthogonal, surface, assembly ...).</p> <p>a) Describes the functions of the machines and manufacturing systems, as well as the tools and accessories</p> <p>b) Selects the tools and supports for fixing parts, depending on the characteristics of the operation.</p> <p>b) Adjusts the parameters of the machining process.</p> <p>b) Loads the numerical control program.</p> <p>b) Introduces the values in the tool tables.</p>					X	X										

Technological	Assembly, adjustment, setting up and maintenance of dies	3rd (180h = 11 ECTS credits)	<p>c)</p> <p>Applies setting up and verification techniques of the components and systems of the die, according to design requirements:</p> <p>a) Selects the types of presses a) Analyses the procedures for assembling and regulating press dies and verifies their correct mechanical functioning. b) Verifies the pieces obtained relating the defects that are obtained with their possible causes. b) Carries out the replacement of parts or elements of the mechanical, hydraulic and pneumatic systems.</p> <p>Organizes and executes the maintenance and repair of dies and auxiliary elements:</p> <p>a) Understands the different types of maintenance existing in a productive system. b) Analyses the existing technical documentation for maintenance work. b) Verifies the different systems that form a die, electric, hydraulic, pneumatic and mechanical. b) Verifies the movements of the kinematic chains of the die components.</p>					X	X								
								X	X								

		<p>a) Identifies possible grants or subsidies for the incorporation of new production or service technologies that are proposed.</p> <p>b) Elaborates the draft that will be followed in the project.</p>																
		<p>Designs projects related to the competences expressed in the title, including and developing the necessary phases.</p>																
		<p>a) Gathers information regarding the aspects that are going to be treated in the Project.</p> <p>b) Carries out the technical feasibility study.</p> <p>a) Identifies the phases or parts that form the Project and its content.</p> <p>a) Establishes the objectives that are intended to be achieved by identifying their scope.</p> <p>a) Foresees the The material and personal resources necessary to carry out the project.</p> <p>a) Sets the corresponding economic budget.</p> <p>a) Defines and elaborates the necessary documentation for the design.</p> <p>b) Identifies the aspects that must be controlled to guarantee the quality of the project.</p>					X		X									

		<p>a) Defines the procedure for evaluating the activities or interventions.</p> <p>a) Defines quality indicators.</p> <p>a) Defines the procedure for the evaluation of the incidents that may arise.</p> <p>a) Defines the procedure to manage possible changes in resources and activities.</p> <p>a) Defines and elaborates the necessary documentation for the evaluation of the activities.</p> <p>b) Establishes the procedure for participation in the evaluation of users and clients.</p> <p>b) Establishes a system to guarantee compliance with the specifications of the project.</p>	X				X		X							
		<p>Presents and defends the project, effectively using the technical and personal skills acquired during the preparation of the project and during the learning process in the training cycle.</p>														
		<p>a) Prepares a document-memory of the Project.</p> <p>a) Prepares a presentation of the document-memory using the NICT</p> <p>a) Makes a presentation of the project, describing its objectives, main contents and justifying the choice of the different action proposals contained therein.</p>	X	X			X		X							

