CENTRE PROJECTS
2019 2020

The projects currently being carried out at CAV Vocational Training Centres

Tknika

Ikerketa Zentroa Euskadiko LHn
Centro de Investigación en FP Euskadi
Basque VET Research Centre

IES Fraisoro Eskola BHI
CIFP Usurbil LHII

HIDROEAT

Bringing greenhouse harvests forward so that Fraisoro students can see the results of their work during the year. To do this, it will be necessary to analyse the different lighting and heating alternatives. The proposals will follow the energy efficiency requirements of today's market.

IES NAUTICO PESQUERO DE PASAIA-BLAS DE LEZO BHI

On the Research and development of Technologies toward Zero Emission Coastal Vessels

The ORTZE-CV project is born with the basic objective to research and develop high performance energy solutions with reduced polluting gas and acoustic emissions (zero emissions in protected environments) particularly for their application in coastal vessels. www.ortze-cv.com

CIFP Escuela De Hostelería LHII (Leioa)

RESTAURANT INDUSTRY 4.0

Modernisation of the Lukitxene restaurant at the Leioa Catering School, turning it into a reference of cutting-edge technology use in the field of gastronomy and oenology, both for the teaching world and for that of companies. This space will also be used to design, test and evaluate technologies aiming to improve food and drink management, preparation and service.

In relation to the environment and the circular economy, to recover waste with a view to introducing composting as a system for reusing food.

CIFP Aretxabaleta Lanbide Eskola LHII

Nondestructive composite testing with ultrasonics

Obtaining teachers trained in the field of UT and PA. Applying said knowledge to the field of composite materials.

CPES Jesuitak Politeknikoa BHIP

Dairy industry waste recovery

Recovery of buttermilk, a dairy industry by-product, which is currently managed as waste, in order to obtain lactic acid. Said acid would be used both as a PLA precursor for 3D printing and to study viability of the buttermilk matrix as a source of nutraceuticals for the pharmaceutical industry.

CPES Tolosako Inmakulada Lanbide Ikastola BHIP

CIFP Meka LHII

BPSO applied to active ageing II

"BPSO applied to Active ageing II" is an innovative project by the Tolosako Inmakulada lanbide Ikastola (TILI) and Meka Lanbide Eskola which creates a new opportunity and anticipates healthcare needs, proactively generating new products, integrating and providing support to BPSO (Best Practices in Care through Centres Committed to Excellence in Care) objectives, with an innovative project focussed on active ageing, and on maintaining the autonomy of people in a situation of dependence.

CIFP Don Bosco LHII

CIFP Tartanga LHII

CIFP Aretxabaleta Lanbide Eskola LHII

CPES Egibide BHIP

Approaching next generation automotive technologies to the classroom environment and to the workers in a car manufacturing factory

To bring the technologies applied in a next generation hybrid vehicle (Hyundai Ioniq) to the classroom environment and to workers in a car factory, in this case RPK s.coop.

At the end of the project the material will be taken to one of the company's Mexican headquarters with a view to making this project known internationally.

CIFP Don Bosco LHII

CPES Lea--Artibai BHIP

Functional foods for preventive and personalised medicine.

In this project the idea is to develop new kinds of functional foods for people with special needs (children, teens, the elderly, sportspeople, etc.), applying circular economy criteria of waste recovery and using a 3D printer. This additive manufacturing technique also offers the possibility of using other protein sources such as algae, insects, etc., or even animal proteins (fish and meat) obtained from cell cultures which are, undoubtedly, more environment friendly due to producing less methane and using less water, meeting the sustainable development goals for 2030).

CIFP Usurbil LHII

7D modelling in the BIM methodology

Here the intention is to teach students how to assemble and carry out (preventive and corrective) maintenance work on installations drawn in BIM, working on 7D.

CIFP San Jorge LHII

Robot controlled by FPV virtual reality using brain waves in the IoT environment

Our aim with this project is to guide a robot by means of brain waves (using an EEG cap) for FPV (First Person View), in an IoT (Internet of Things) environment.

IES Fraisoro Eskola BHI
IES Náutico Pesquero de Pasaia - Blas de Lezo BHI
CIFP de Desarrollo Sostenible en Edificación Inteligente LHII

BERTK; Turf grass with native species and installation of green roofs

The turf grass options available on the market pose problems for their development in our environment. The purpose of this project is to create turf grass with native species and to install green roofs.

CPES Lea--Artibai BHIP

Development and manufacture in composite material of a children's size cesta-punta basket glove for use in sport at school

Development of a cesta punta sample in composite material which, once validated, will substitute the currently used versions and can be manufactured at a lower cost for use by children who do sport at school within the XISTERA association. In order for the sample to meet requirements, the different kind of materials and processes must be studied and work carried out to combine the materials and processes.

CIFP Don Bosco LHII

PCB-3D, 3D printing of printed circuit boards

The main goal of the project is to innovate in the application of additive technology and 3D printing in the field of printed circuit board prototyping. While the project is underway, a 3D printer will be acquired for printing electronic circuit boards and a study will be made of the viability and introduction of this kind of printers to training cycles in the Electricity-Electronics professional family and to companies in the electronic sector environment.

CIFP de Desarrollo Sostenible en Edificación Inteligente LHII

CIFP Usurbil LHII

NOEREN ETXEA

It can be said that Noah's Ark was the first autonomous house in history, having travelled for 150 days without touching land. Following this example, the objective of the project is to construct an autonomous building, studying the integral water circuit and using it in the most efficient and sustainable way possible.

CPES del Goierri BHIP

CPES Mondragon Goi Es. Politek., J.M.A.,S. COOP BHIP

Collaborative design for additive manufacturing in the connected industry with 3DExperience

The big companies in the aeronautics sector such as Boeing, Renault in the automotive and CAF in the railway sector are signing contracts for millions of euros to use the 3DExperience as their development platform in coming years. The 3DExperience is the new cloud platform enabling collaborative design between industry technicians connected in places geographically distant from one another and has specialised techniques and tools for the geometric design and preparation of additive manufacturing.

CPES Tolosako Inmakulada Lanbide Ikastola BHIP

CPES Calasanz Lanbide Ikastegia BHIP

CPES Harrobia BHIP

Physical exercise to promote active, healthy ageing

Through two different challenges, the idea is to promote active ageing by means of physical activity. The main objective of the project is to develop a proposal to empower the elderly in order to promote active ageing (physical activity) in the health and social well being cycles of professional training.

CIFP Don Bosco LHII
CIFP De Innovacion Social LHII

AUTO FV LAB - Photovoltaic Laboratory

Study of the current state and latest changes in photovoltaic self-consumption regulations and their practical consequences, as well as analysis of the state of the art of photovoltaic technology. Sensorization, monitoring and processing of data in a connected micro-network and economic study of the viability/amortisation of two typical twin photovoltaic installations, connected to a network and monitored, in order to transfer knowledge to VE teachers and students, and to companies in our production environment.

CIFP Mendizabala LHII
CIFP Emilio Campuzano LHII
CIFP Miguel Altuna LHII

Topology optimisation and material tests for SMEs

This project proposes collaboration with SMEs from the industrial environment of Álava in the topological study of parts in order to offer designs, manufacturing processes and innovative materials to help company competitiveness.

CIFP Tolosaldea LHII
CIFP Meka LHII

Construction of polymer structures and composites

To know and learn technology for moulding and welding polymers and composites for its introduction to different cycles (welding and boilermaking, metal constructions) in the shape of projects.

CIFP Emilio Campuzano LHII
CIFP Mendizabala LHII

3D Printing technologies' aplications in Graphic Arts

This Project aims to introduce 3D Printing technologies in Graphic Arts' Studies in Basque VET System, focusing on FDM, SLA and Polyjet tecnologies. The examples and applications to be developped can be final product or a part of the production system.

CPES Txorierri S. COOP. LTDA. BHIP
CIFP Armeria Eskola LHII

In-process measurement (for the CNC machine tool)

To acquire knowledge. To work with software, systems and utilities enabling the use of a numerical control machine in the same way as a coordinate measuring machine, thereby achieving a wide range of measuring programmes.

To extend training activity (Official/Unofficial) and services activity to companies.

CPEIPS San Viator HLBHIP
CIFP Don Bosco LHII
CIFP Iurreta LHII
CIFP Meka LHII

POWERTRAIN

The project seeks to achieve the integration and documentation of a low voltage powertrain for use in the third edition of the "Euskelec" VE electric car competition, and to create an open learning platform (hardware/software) on electric vehicle components based on a model and on a series of tests/trials which can be carried out on it.

CPES Escuela Superior de Hostelería Artxanda B BHIP

Digital innovation using 3D printing and generation of new professional profiles in the gastronomy sector.

To generate two new gastronomic profiles: digital chef and digital sous chef, from innovation in the gastronomy sector.

To innovate in the restaurant sector by means of new machinery such as 3D printers for printing food products or printing on specific articles suitable for the restaurant service.

CPEIPS La Inmaculada HLBHIP

Learning applied to robotics and mixed virtual reality in education for children

Use and application of robotics, virtual reality and mixed reality in the Primary School classroom in order to acquire the capacity to solve problems by means of a sequence of actions from early ages. This will enable the pupils to generate strategies of thinking and learning which will be essential for their development from an inclusive point of view.

CPES Harrobia BHIP

Basurto Infirmary. Optimised training for classifying patients in emergency situations, by means of simulating spaces and situations using virtual reality.

Development of a triage simulator based on the Manchester methodology used at Basurto hospital for nursing staff training and improvement. Researching and carrying out the required development work.

CIFP Tartanga LHII

ARGITZEN: Design and implementation of an artistic, interactive LED installation based on pixel mapping techniques.

Study of new emerging audiovisual technologies and techniques and their subsequent application to the design and introduction of an artistic and interactive LED installation, situated at the CIFP Tartanga; based on the integration of traditional sensory methods with lighting techniques based on pixel mapping.

CPES Harrobia BHIP

Manufacturing process validation using virtual reality (MPVVR)

MPVVR attends to the need of the Irizar bus manufacturing company in part of its digitalization process and transformation to industry 4.0.

MPVVR uses VR simulation for the initial phase of the manufacturing process, favouring the validation of parts, reducing the validation time, increasing the number of validations and reducing costs and the carbon footprint.

CIFP Miguel Altuna LHII
CIFP Armeria Eskola LHII

Large-scale 3D printing with robots, using recycled plastic

The idea is to progress to a higher scale with the additive manufacturing technology following the strategy of successful experiences obtained by foreign companies. In all of these experiences the raw material is plastic pellets and a robotic arm duly deposits said material in the printing area.

CIFP Monte Albertia LHII
CIFP Miguel Altuna LHII

Creation of a wig using the injection process based on a scan and 3D printing

This is the follow-up of a project carried out in 2018-19, where the results of the scan were perfect but those of the 3D printing were not up to scratch. Our objective has focussed on the printing of a base used by the collaborating company Rueber, obtaining a limited result. Even so, during the last phase of the project, looking deeper into the technological research, we have concentrated on a prosthetic base worked by the Italian company Cesare Ragazzi based on injection. We believe that by using this process we can achieve a suitable base.

CPES Tolosako Inmakulada Lanbide Ikastola BHIP

CIFP Tolosaldea LHII

CPES Harrobia BHIP

Teleadin II

A remote healthcare system will be developed under which elderly people who live alone and may be suffering a series of chronic diseases or geriatric syndromes can continue to live in their homes for as long as possible.

IES Escuela Agraria de Derio / Derio Nekazaritza Eskola BHI

Creation of Sustainable Economy Models in the field of agri-food transformation

Once the facilities of the previous year have been built, the aim is to work on the fields of dissemination and transfer in the area of agri-food transformation both to students at the school and to SMEs in the agrarian sector. We will also look for new models of sustainable economy within the bioeconomy applied to VE.

CPES del Goierri BHIP

CPES Mondragon Goi Es. Politek., J.M.A.,S.COOP BHIP

FEM simulation of welded joints in hoisting systems

Definition of a procedure to dimension and calculate welded joints in hoisting systems based on simulation techniques using finite elements, always guaranteeing the durability demanded of the functioning equipment, thereby obtaining greater performance from the materials used, preserving the standards of durability and correct functioning of the equipment.

CPES Harrobia BHIP

Development of advanced technologies enabling synergy between audiovisual animation and the video games sector.

The project has the main objective of adapting the graphic material generated in a 3D animated film to a video game. The project encompasses the research and the application of different technologies and will end with a sample video game.

CPEIPS La Salle Berrozpe HLBHIP
CIFP Don Bosco LHII

Humanoid care-providing robot designed with real-time technology and 3D printing

The design and construction of an open humanoid robot using open FPGAs and being able to carry out a real-time control for application to care robotics. The idea is for the mechanical pieces, the electronic circuit and the control programme to follow the open code philosophy and to become available for society.

CPES del Goierri BHIP
CPES Txorierri S. COOP. LTDA. BHIP

Latest trends in subtractive technologies, in advanced materials: CAM strategies and tools

VE schools have industrial production means which can help, by means of tests and trials, to characterise the optimum conditions for carrying out processes, combining knowledge of new CAM strategies and of new unconventional tools and materials.

Carrying out of analyses and trials to define the technological conditions in rotary cutting tools (milling cutters), prediction of behaviours, etc. Acting as a support to tool manufacturing companies and, in exchange, receiving the know-how from these companies. SPECIFIC OBJECTIVES: 1. To acquire knowledge of the manufacturing variables in advanced materials (CAM strategies, tools). 2. To take said knowledge to the other VE schools. 3. To take said knowledge to industrial SMEs in the mechanical manufacturing sector.

CPES Urola GAraiko Lanbide Eskola BHIP

Integration of systems in an INDUSTRY 4.0 forging cell

The project endeavours to integrate a series of technologies in an installation specifically prepared for the purpose at the UGLE school facilities, creating a DIGITAL AND CONNECTED FACTORY. The digital and connected factory has all of the elements required to carry out a real factory process, incorporating technologies intended to lend intelligence (functionalities) to the equipment.

These facilities will be the setting for development of the processes, the programming, acquisition and processing of data and design of strategies for decision making based on the latter, creating a test laboratory for students and companies.

CPEIPS Salesianos Deusto - M. Aux.-SA HLBHIP

YUMI IRB - 14050

Development and introduction of the ABB IRB-14050 collaborative robot with an Omnicore controller and SmartGripper. The references taken will be both ABB (IRB120) industrial robots and the dual-armed Yumi IRB-14000, as well as their RAPID programming language and simulation at the Robotstudio.

CIFP Tolosaldea LHII
CIFP Usurbil LHII
CIFP Aretxabaleta Lanbide Eskola LHII

Sustainable urban mobility experience

To demonstrate that electric Personal Mobility Vehicles can be an alternative for decarbonising the transport of people to the Tolosaldea LHII school.

CIFP Bidasoa LHII
CIFP Tolosaldea LHII
IES Plaiaundi BHI
CIFP Don Bosco LHII

Construction and monitoring of free telecommunications networks and the IoT (Internet of Things)

Construction and monitoring of the free Telecommunications and IoT (Internet of Things) networks. Last year the telecommunications infrastructures were assembled at the CIFP BIDASOA and CIFP TOLOSALDEA, and the idea is to monitor these. Furthermore, based on this, a LoRaWAN gateway has also been assembled and the aim is to make readings of different sensors.

CPES Somorrostro BHIP
CIFP Elorrieta-Erreka Mari LHII

Implementation of new professional profiles for the manufacture of products and capital goods by welding and shaping environmentally sustainable plastic materials

Project consisting of the training and qualification of plastic extrusion welders and plastic boilermakers, by means of designing a specific programme of training actions in the processing of welding manufacturing and thermoplastic moulding, aspects which are not envisaged in the current design of the VE curriculum.

CPES Somorrostro BHIP
CIFP Usurbil LHII

INTELLIGENT MICROGRIDS. Applying Intelligence and Augmented Reality

Based on the project developed in 2018/19 in which we were capable of connecting to the micro-network to obtain data on the consumption, generation and storage of energy and on the application developed in order to decide what to do with the energy at each moment (according to meteorological data and patterns of behaviour), with this extension of the project we want the application developed to be able to make decisions on its own, based on already made decisions (i.e. to learn) using Artificial Intelligence. We also want to increase the knowledge of the actual micro-network, increasing its information with Augmented Reality techniques.

CPES del Goierri BHIP

Atomic Diffusion Additive Manufacturing

Among the main objectives of the "Atomic Diffusion Additive Manufacturing" project is the generation of a document on theoretical concepts and phases of the manufacturing processes. Among others, we will analyse the manufacturing strategies used, as well as the main parameters to be taken into account during the design and manufacturing process. To do this, at least two "typical" pieces will be built, analysing and documenting the process in detail.

On the other hand, both the mechanical and the economic characteristics of parts obtained by means of the ADAM and SLM technology will be compared, compiling the results in the same document.

CPES Arratiako Zulaibar Lanbide Ikastegia BHIP
CPES Mondragon Goi Esk. Politek., J.M.A.,S.COOP BHIP

Sensorization and monitoring of grinding heads in processes of machining special cutting tools

The objective of the project is to sensorize and monitor a grinder in a process of machining cutting tools with a view to detecting and controlling the most influential factors in the process. Analysing the data obtained from the monitoring, the idea is to draw up a correlation between the most influential cutting factors of the process and the errors detected in the parts. The intention with these actions is to stabilise the process.

CPES Lea Artibai BHIP
CPES Txorierri S. COOP. LTDA. BHIP
CPES Mondragon Goi Esk. Politek., J.M.A.,S.COOP BHIP
CPES del Goierri BHIP
CPES Arratiako Zulaibar Lanbide Ikastegia BHIP

3D printing of tools in Industry 4.0

The aim of the project is to practically explore an industry 4.0 concept for rapid tool manufacture by means of combining collaborative CAD/CAM/CAE platforms in the cloud and the metal 3D printing now being introduced to the syllabus of Training Cycles, and to generate explanatory material for Training Cycle professors and students.

The reduction in commercialisation time, flexible production, the durability of the stamping dies and the reduction in injection moulding cooling times are key points which may succeed in making Additive Manufacturing a success.

CPES Maristak Durango BHIP
CPES Zabalburu BHIP

Servitization 4.0

This process endeavours to transport the concept of Servitization to the world of Industry 4.0 by means of its digitalization. The idea is to set this concept in motion by means of analysing different business hypotheses in order to implement it in the stamping sector, and to digitalize it in such a way that it can be automated, endeavouring to remove intermediaries and centralise data.

CPES Somorrostro BHIP
CPES Mondragon Goi Esk. Politek., J.M.A.,S.COOP BHIP
CPES Egibide BHIP

Experiments with cutting tools made using hybrid processes for the machining of ductile alloys

The project consists of manufacturing a series of cutting tools using a combination of processes in which additive manufacturing technologies prevail over the others. In the first manufacturing stage, corresponding to additive manufacturing, metal extrusion technologies will be used, a combination of the FDM and MM technologies, and of selective laser melting (SLM). Subsequently, the preforms obtained will be machined, only in areas requiring the necessary characteristics, for good functioning of the cutting tools. Once the finished products have been obtained, we will proceed to experiment with them on different machine-tools in order to evaluate and characterise said tools.

CIFP Andra Mari LHII

Accreditation of learning results using the Blockchain disruptive technology

To configure a platform with blockchain technology capable of permanently certifying learning achievements.

CIFP Tolosaldea LHII

MIG-MAG welding 4.0

The objective of the project is to study the functioning of manual welding machines based on the 4.0 concept and analysis of the results obtained. Work will therefore involve a MIG-MAG X8 welding machine and the WELDEYE software for collecting and processing data; an analysis will be made of its full potential in different welded structure projects.