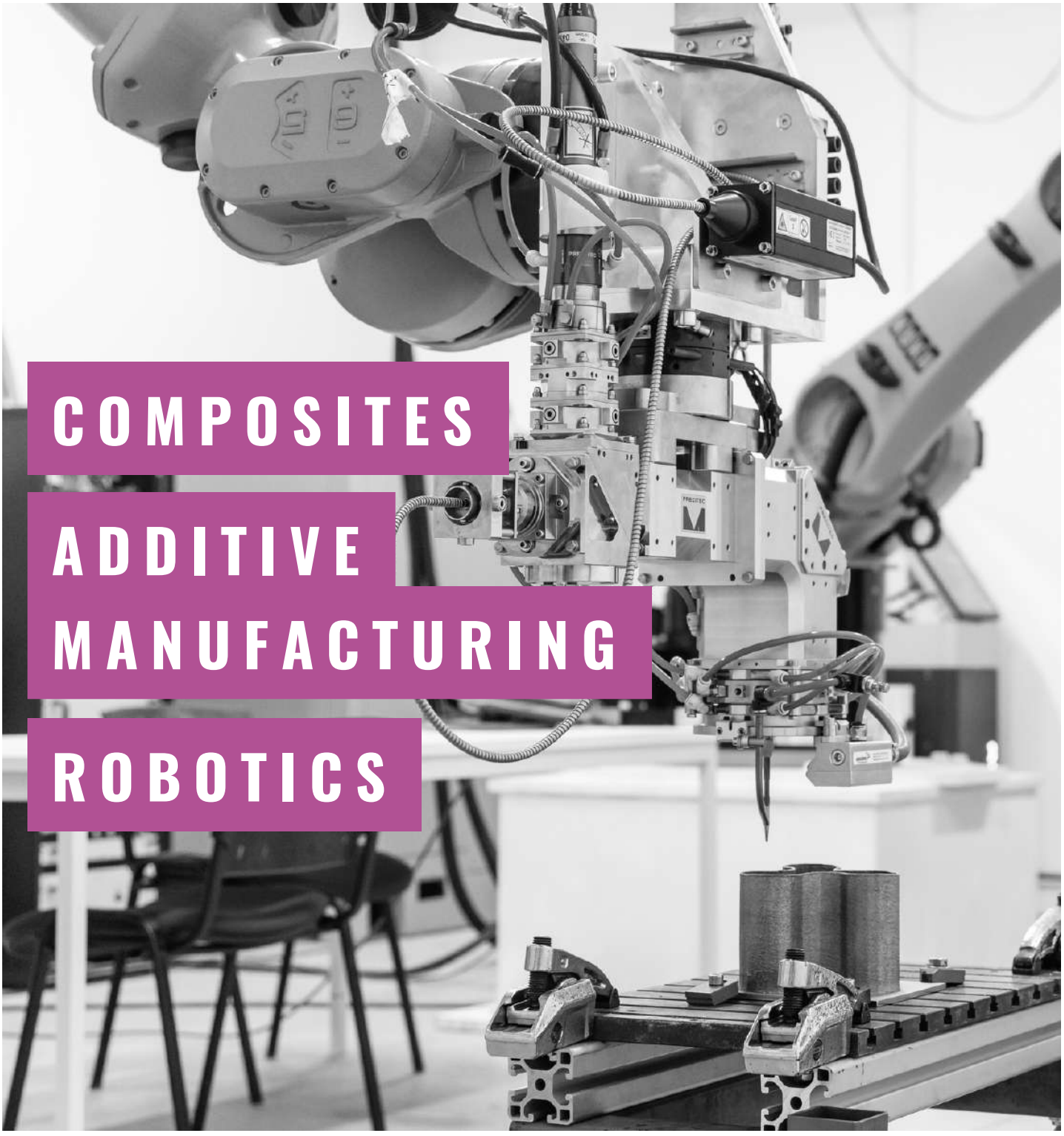
TRAINING CATALOG



COMPOSITADOUR
COMPOSITES & ROBOTICS SOLUTIONS

ESTIA
INSTITUTE OF TECHNOLOGY

CCI BAYONNE PAYS BASQUE

COMPOSITADOUR
COMPOSITES & ROBOTICS SOLUTIONS

With almost a decade of expertise dedicated to enhancing and expanding the skills of employees in the aeronautical sector, we are able to offer you training programmes that are tailor-made, progressive and aligned as closely as possible with the requirements of the professional world.

Since June 2023, Compositadour has been certified as a centre of excellence by Dassault Système.

Compositadour, your partner for building your career
your career path and that of your teams.

TABLE OF CONTENTS

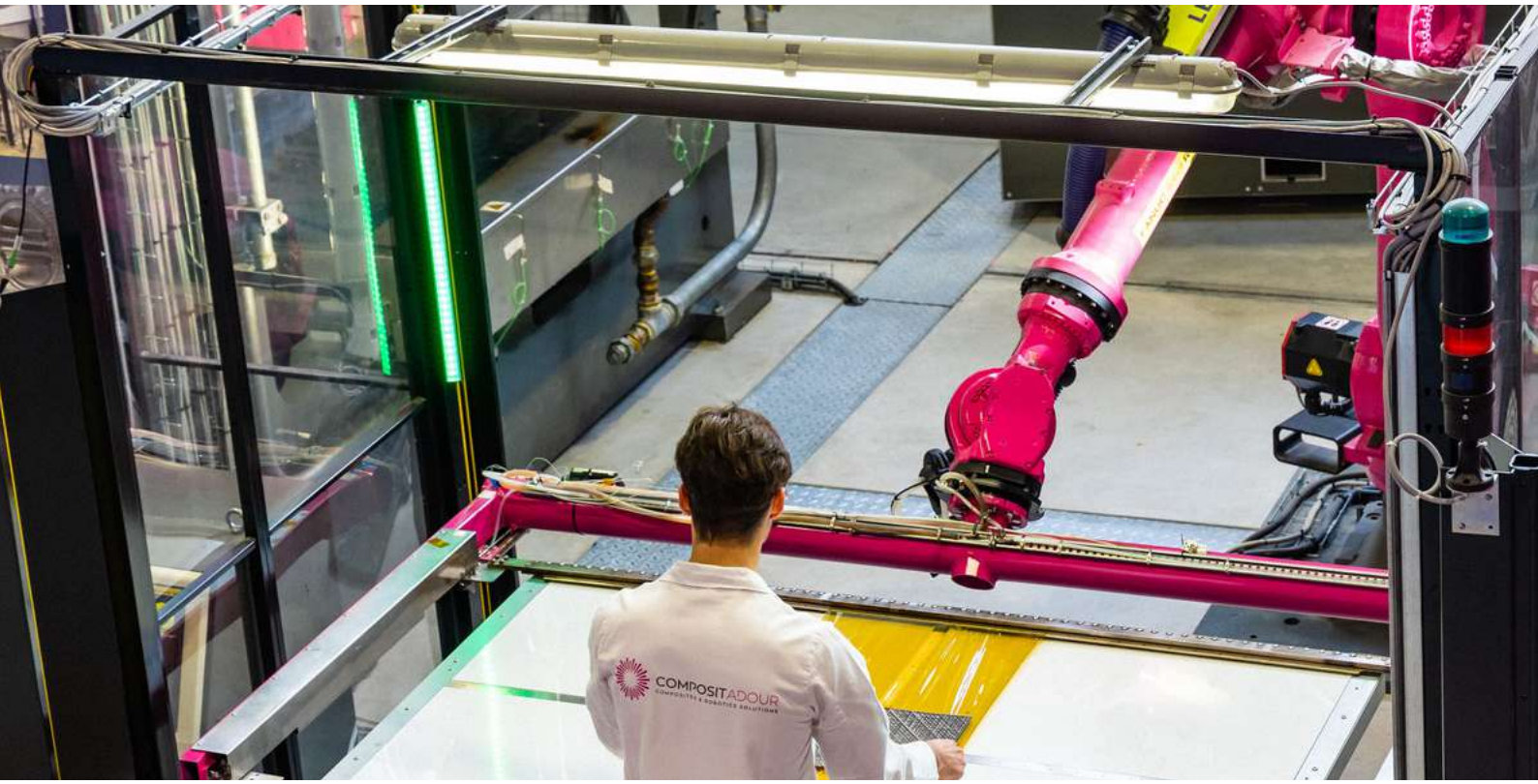
Presentation of our platforms

Compositadour is a technology platform specialising in advanced processes: Composites, Robotics and Additive Manufacturing. A genuine platform for experimenting with the digital and robotic technologies of the Factory of the Future, Compositadour offers cutting-edge equipment and mobilises its network of skills from laboratories, SMEs and major industrial groups to develop innovative projects.

Backed by the Compositadour platform, Addimadour was launched in 2017 by and for companies to help them develop their metal additive manufacturing projects. Born from the meeting of industrial needs and the scientific and technological resources of theEcole Supérieure des Technologies Industrielles Avancées (ESTIA), this new ESTIA metal additive manufacturing platform enhances Compositadour's offering.

Created in 2023, covering more than 1,200 m2, TURBOLAB is a test platform shared by industry, research and education, dedicated to innovative aeronautical propulsion. TURBOLAB serves the aeronautical industry by testing and characterising all types of aeronautical propulsion systems, whether hybrid, electric or using alternative fuels. The platform's efficiency is based on its agility and proximity to the Compositadour and Addimadour technology centres, as well as to its industrial partner Akira Technologies, enabling it to meet all requirements.

COMPOSITES
TRAINING



TRAINING MODULES

M1 - INTRODUCTION TO COMPOSITES PROCESSING
M2 - DESIGN AND DIMENSIONING OF COMPOSITE PARTS
M3 - IMPLEMENTATION OF COMPOSITES FOR AERONAUTICS
M4 - ROBOTIC FIBER PLACEMENT
M5 - SANDWICH MATERIALS AND BONDED STRUCTURES
M6 - CQPM HIGH-PERFORMANCE COMPOSITE MATERIALS OPERATOR
M7 - REPAIR OF COMPOSITE MATERIALS
M8 - STAMPING OF THERMOPLASTIC MATRIX COMPOSITE PARTS

COMPOSITADOUR
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INSTITUTE OF TECHNOLOGY

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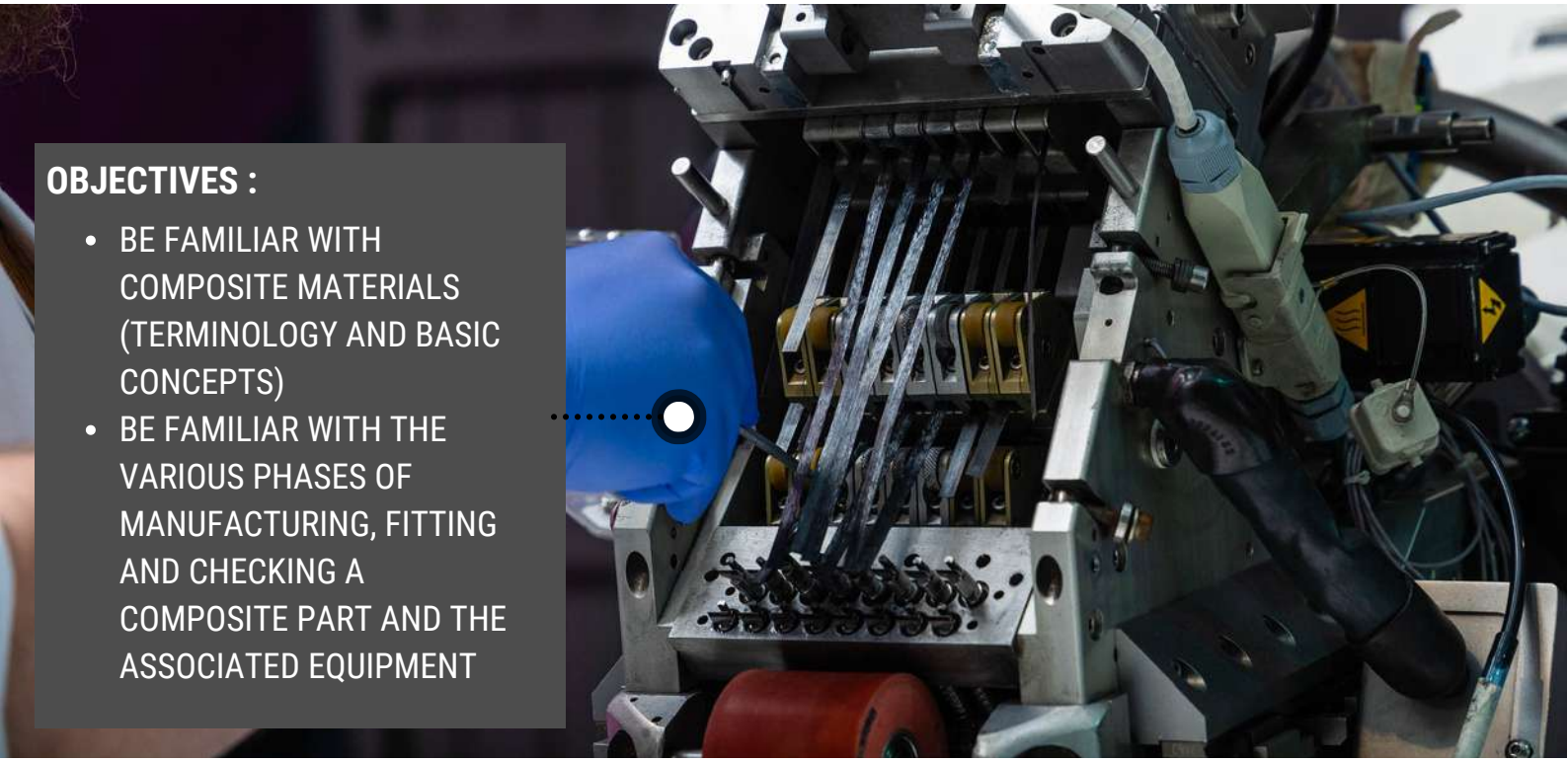


OBJECTIVES :

- BE FAMILIAR WITH COMPOSITE MATERIALS (TERMINOLOGY AND BASIC CONCEPTS)
- BE FAMILIAR WITH THE VARIOUS PHASES OF MANUFACTURING, FITTING AND CHECKING A COMPOSITE PART AND THE ASSOCIATED EQUIPMENT

M1 - INTRODUCTION TO COMPOSITES PROCESSING

IIntroduction to Composite Materials :

- Generalities and terminology / Materials: fibres, resins and core materials / Application processes / Examples of applications

Draping of Prepregs :

- Tool preparation (cleaning + release treatment) / Cutting of fabrics, pre-impregnated UD sheets / Lay-up of prepregs (monolithic or sandwich part) / Lay-up of reinforcements with 3D projection master / Vacuum bagging / Polymerisation (cycle programming, cure monitoring) / Demoulding and analysis of cure cycle.

RTM (Resin Transfer Moulding) :

- Tool preparation (cleaning + release treatment) / Cutting of dry fabrics and draping of preforms / Fitting of injection tooling / Programming of injection parameters (T°, flow rate, pressure, etc.) / RTM injection under heated press and polymerisation under press.

Production of an infusion plate:

- Analysis of the draping plan and definition of the infusion strategy / Cutting and draping of dry fabrics / Draping of dry fabrics / Installation of infusion peripherals and monitoring of infusion / Demoulding and analysis

Adjustment

Control

PREREQUISITES

No prerequisites

DURATION

1 - 6 days

VENUE

Compositadour, Bayonne

OBJECTIVES :

- KNOWLEDGE OF METHODS FOR DESIGNING PARTS IN COMPOSITE MATERIALS
- KNOWLEDGE OF METHODS FOR DIMENSIONING PARTS IN COMPOSITE MATERIALS

M2 - DESIGN AND DIMENSIONING OF COMPOSITE PARTS

Composite Materials (Reminder)

Mechanical Behaviour of Laminates :

- Ply properties / Law of behaviour of an anisotropic laminate / Sizing criteria and tools

Digital Design and Simulation Tools :

- CATIA CPD: from design to manufacturing / FE sizing: example of a simple case using Ansys ACP

The stages of Finite Element Calculation :

- Static calculation / Boundary conditions / Load case applications

Analysis of the results of a Finite Element Calculation :

- Fracture stresses / Maximum displacement / Optimisation loops

Option: Application cases requested by the company:

- Design assistance / Sizing assistance

PREREQUISITES

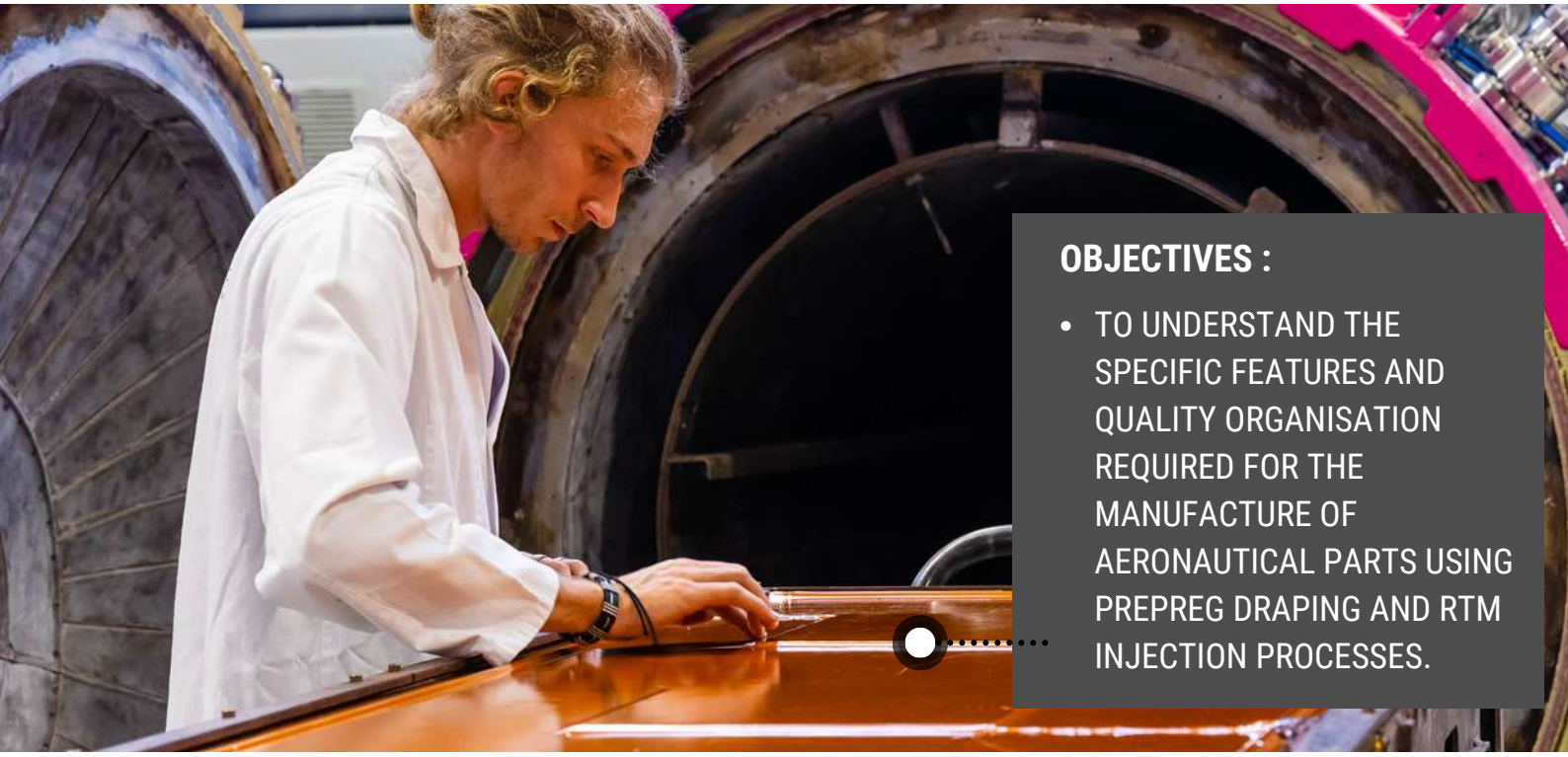
Basic concepts of mechanical calculation and strength of materials

DURATION

3 - 8 days

VENUE

Compositadour, Bayonne



OBJECTIVES :

- TO UNDERSTAND THE SPECIFIC FEATURES AND QUALITY ORGANISATION REQUIRED FOR THE MANUFACTURE OF AERONAUTICAL PARTS USING PREPREG DRAPING AND RTM INJECTION PROCESSES.

M3 - IMPLEMENTATION OF COMPOSITES FOR AERONAUTICS

The use of composites in Aeronautics, Generalities and Quality Environment :

- Studying customer specifications / Designing parts and tools / Drawing up technical manufacturing instructions and inspection instructions / Drawing up production monitoring documents

Use of the prepreg draping process for the aeronautical industry :

- Preparing the environment and workstation / Manufacturing the part in accordance with technical instructions / Checking during production

Using the RTM process for aeronautics :

- Preparation of the environment and workstation / Manufacture of the part in accordance with technical instructions / In-process inspection

Destructive / non-destructive testing and quality monitoring :

- Inspection of the part in accordance with the inspection instruction / Preparation of the part monitoring file / FAI and certificate of conformity.

PREREQUISITES

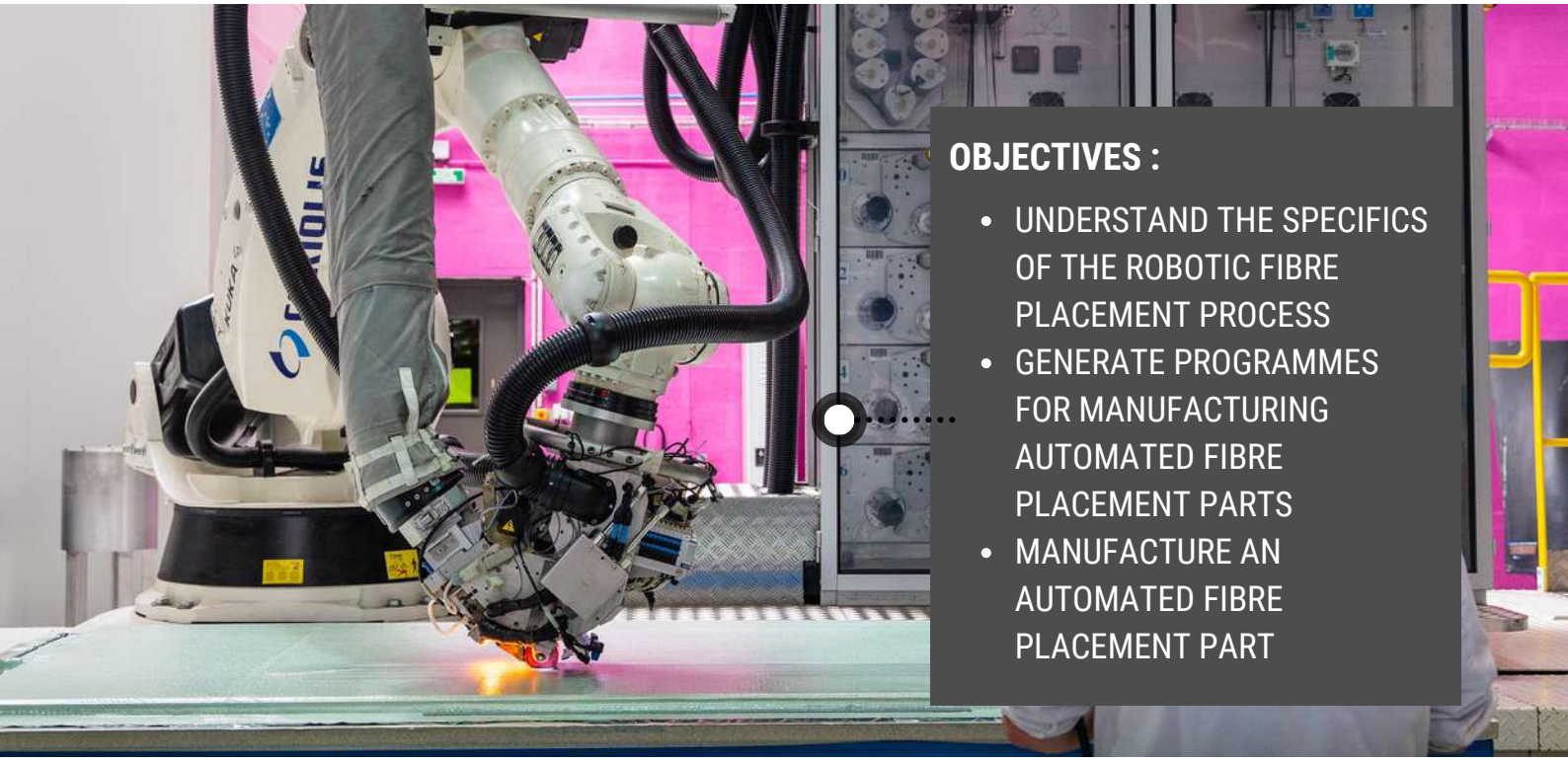
Fundamentals of composite materials (M1)

DURATION

2 - 7 days

VENUE

Compositadour, Bayonne



OBJECTIVES :

- UNDERSTAND THE SPECIFICS OF THE ROBOTIC FIBRE PLACEMENT PROCESS
- GENERATE PROGRAMMES FOR MANUFACTURING AUTOMATED FIBRE PLACEMENT PARTS
- MANUFACTURE AN AUTOMATED FIBRE PLACEMENT PART

M4 - ROBOTIC FIBER PLACEMENT

CAT Fiber programming :

- General presentation of the software / Retrieving the surface and contours to be meshed / Creating a mesh / Creating folds / Creating reference curves or rosette transfer / Producibility: steering analysis and angular deviation / Creating the Process / Assigning a head / Generating strips / Checking head - mould collisions / Measuring strip lengths / Importing the cell and head with the part / Positioning the mould in the cell / Defining strategies / Creating the ToolPath / Simulating draping / Creating draping files

Manufacturing an AFP part

- Presentation of the robot's various components / Creel - Robot head - Heating medium / Labelling of coils / Registering coils in the HMI / Loading the creel / Palpating a tool / Dry Run: playing with blank programmes / Heating law: AFP / TP / Preg / Sheet draping / Draping complex parts: passing a corner.

The course is run by professionals from COMPOSITADOUR and CORIOLIS.

PREREQUISITES

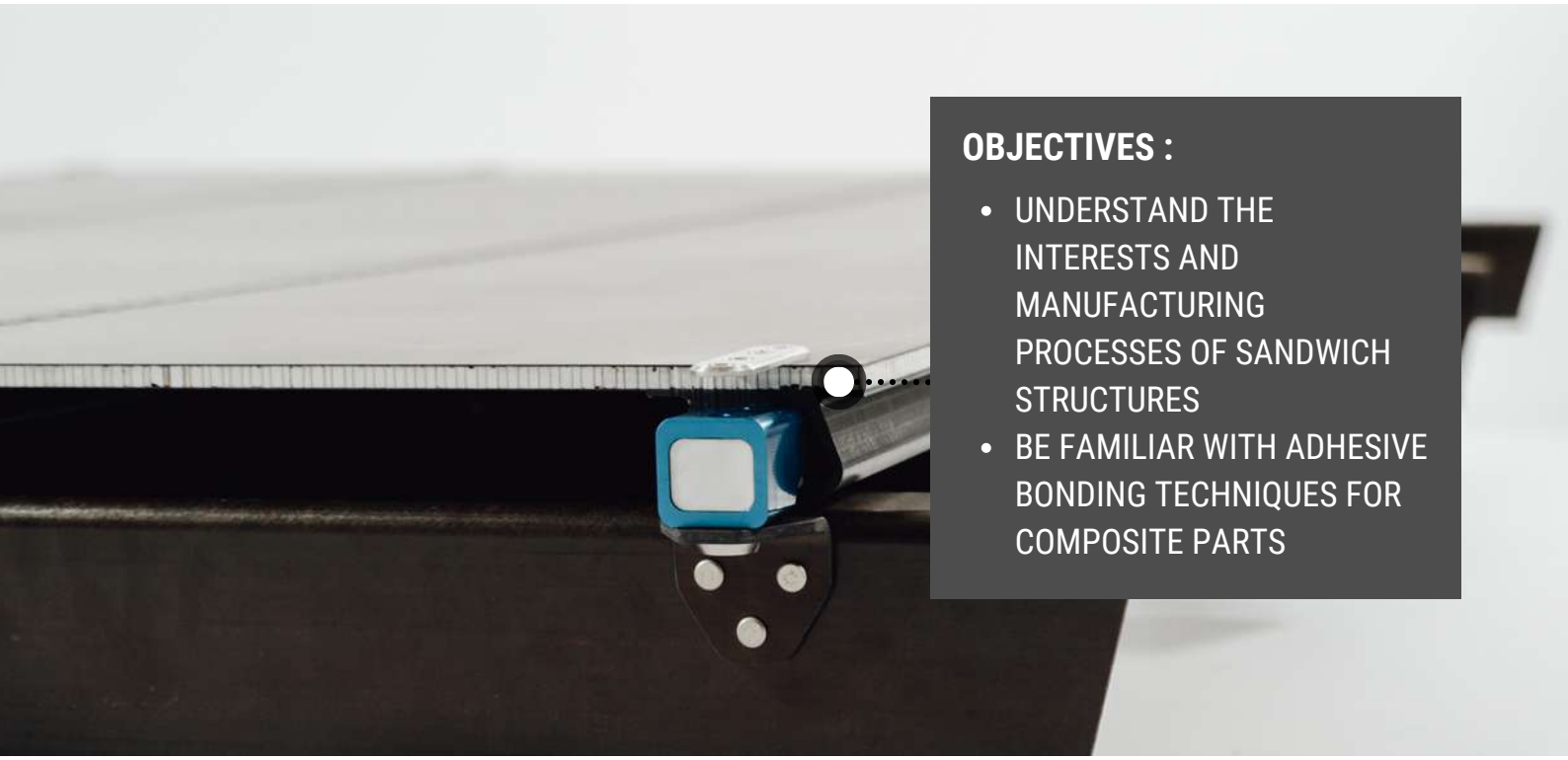
Fundamentals of composite materials (M1), Fundamentals of CATIA CPD and meshing

DURATION

3 - 6 days

VENUE

Compositadour, Bayonne



OBJECTIVES :

- UNDERSTAND THE INTERESTS AND MANUFACTURING PROCESSES OF SANDWICH STRUCTURES
- BE FAMILIAR WITH ADHESIVE BONDING TECHNIQUES FOR COMPOSITE PARTS

M5 - SANDWICH MATERIALS AND BONDED STRUCTURES

Sandwich structures

- General and terminology / Core materials / Notions of the mechanical behaviour of a sandwich structure / Installation of a sandwich structure / Finishing (routing, drilling, edging) / Assembly: fitting inserts and fixing

Bonding

- Different bonding systems (PU, epoxy, etc.) / Surface preparation / Bonding processes for composite parts

PREREQUISITES

No prerequisites

DURATION

3 days

VENUE

Compositadour, Bayonne

OBJECTIVES :

- UNDERSTAND THE INTERESTS AND MANUFACTURING PROCESSES OF SANDWICH STRUCTURES
- BE FAMILIAR WITH ADHESIVE BONDING TECHNIQUES FOR COMPOSITE PARTS

M6- CQPM HIGH-PERFORMANCE COMPOSITE MATERIALS OPERATOR

Approach to the workplace / QSE

- Job search techniques / Quality, Health and Safety / Workshop calculations

Theory / Technology

- Plan reading / Implementation and behaviour of TD resins / Reinforcements for organic matrix composites / The different implementation processes / Contact moulding to make a mould / Pre-impregnated fabrics / Preparation of moulds for wet lamination / Wet lamination / Sandwich structures / Polymerisation cycle / Inspection technique / Draping of pre-impregnated fabrics.

Practical work

- Making a mould for contact moulding / Non-destructive testing (ultrasound) on a composite plate / Making a vacuum bag / Dry lamination of a monolithic part / Making a sandwich with a NIDA aluminium core / Making a sandwich with a NIDA aluminium core with densification / Laminating a sandwich structure with pre-preg fabric edging / Ultrasonic inspection / Finishing.

175-hour in-company work placement

This Qualiopi-certified training course is run in partnership with the Adour training centre, UIMM.

Qualiopi processus certifié

UIMM Adour La fabrique de l'avenir

PREREQUISITES

No prerequisites

DURATION

4 months

INSCRIPTION

05.59.00.01.01
pole-formation-adour@metaladour.org

OBJECTIVES :

- TO BE FAMILIAR WITH THE SPECIFIC FEATURES OF REPAIRS TO COMPOSITE MATERIALS IN THE AERONAUTICAL SECTOR
- BE ABLE TO REPAIR COMPOSITE MATERIAL ASSEMBLIES OR SUB-ASSEMBLIES

M7 - REPAIR OF COMPOSITE MATERIALS

A reminder of composite materials and the main rules for the design and draping of monolithic elements
Bonding and composite materials
Maintenance and repair of structural composites
Practice of several types of repair: aesthetic, structural, "flush", "patch"
Use of polymerisation kits
Non-destructive testing after repair

The course is run in partnership with Aerocampus Aquitaine

AEROCAMPUS AQUITAINE

PREREQUISITES

Fundamentals of composite materials (M1)

DURATION

5 days

VENUE

Compositadour, Bayonne

OBJECTIVES :

- UNDERSTANDING THE SPECIFICS OF TP STAMPING AND PRESS CONSOLIDATION
- CONTROLLING A STAMPING LINE AND ADJUSTING KEY PROCESS PARAMETERS ACCORDING TO THE MATERIAL USED.

M8 - STAMPING OF THERMOPLASTIC MATRIX COMPOSITE PARTS

Overview of thermoplastic composite materials. Specific features of their processing according to their transformation temperatures
Presentation of key process parameters and practical application to simple parts (sheets)
Production of complex parts by stamping

This course is run in partnership with TC Composites Solutions.

PREREQUISITES

Fundamentals of composite materials (M1)

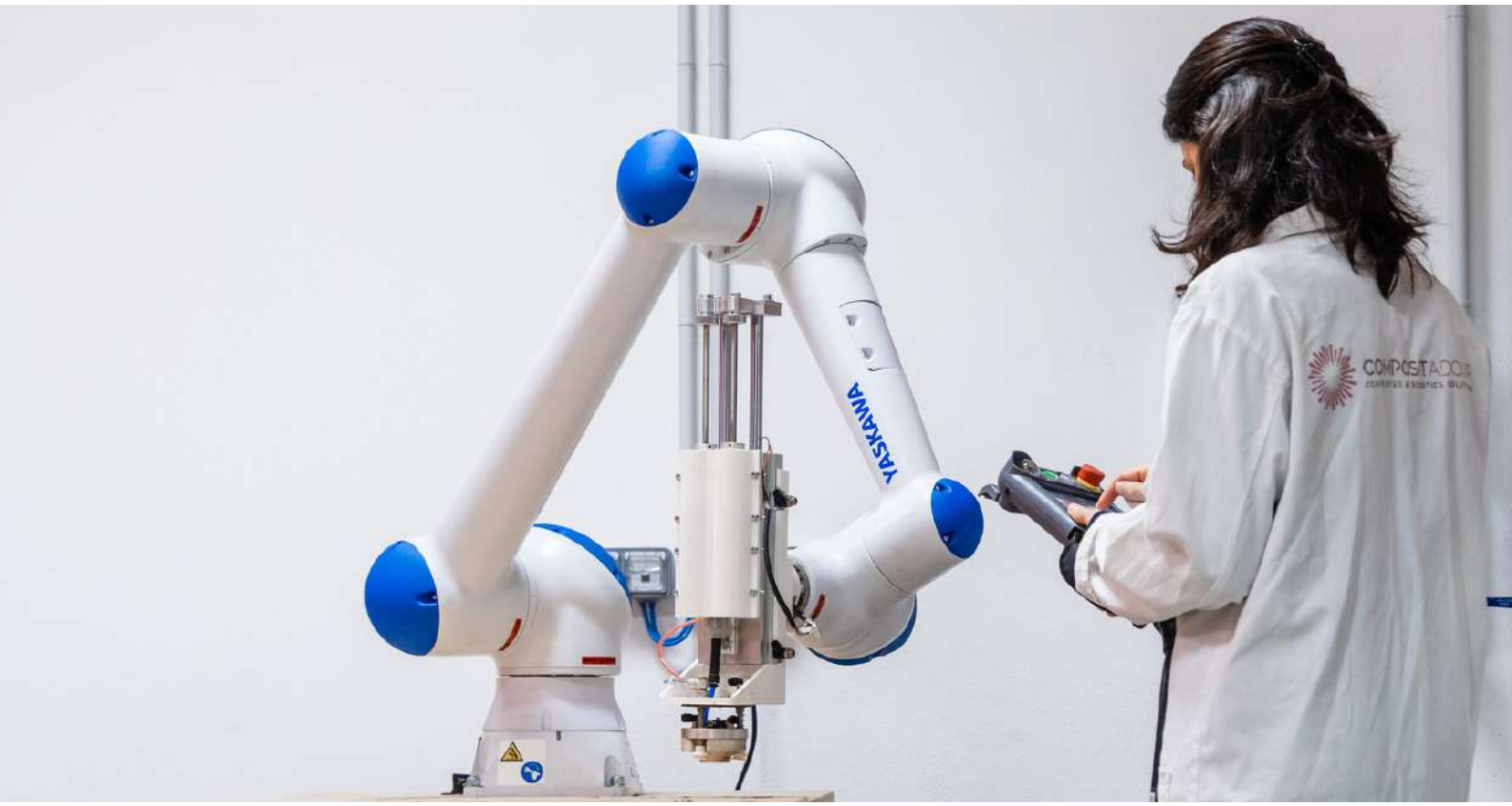
DURATION

3 days

VENUE

Compositadour, Bayonne

ROBOTICS
TRAINING



TRAINING MODULES

M1 - GENERALITIES IN ROBOTICS
M2 - MODELLING
M3 - PATH GENERATION

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OBJECTIVES :

- ROBOT MANIPULATION : (ARTICULAR OR CARTESIAN)
- LEARNING A TOOL AND A BASE
- MANUAL LEARNING OF A TRAJECTORY

M1 - GENERALITIES IN ROBOTICS

Generalities
- What is an industrial robot / Applications / Operating principles / Safety / Robot characteristics

To find out more :
- Control modes / What happens behind the control / Coordinate systems

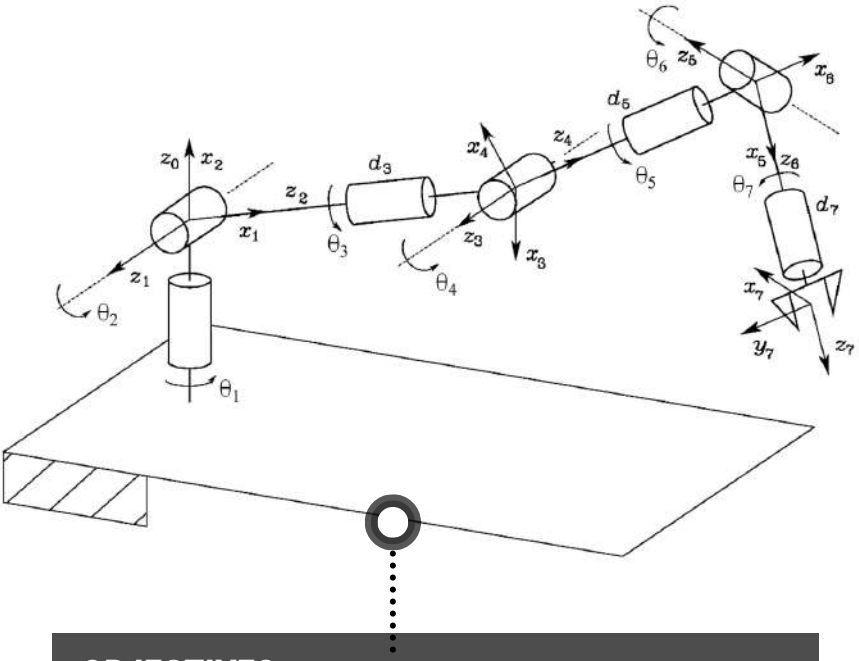
With which programme?
- Complexity of the task / Types of programming / Manual learning / Off-line programming

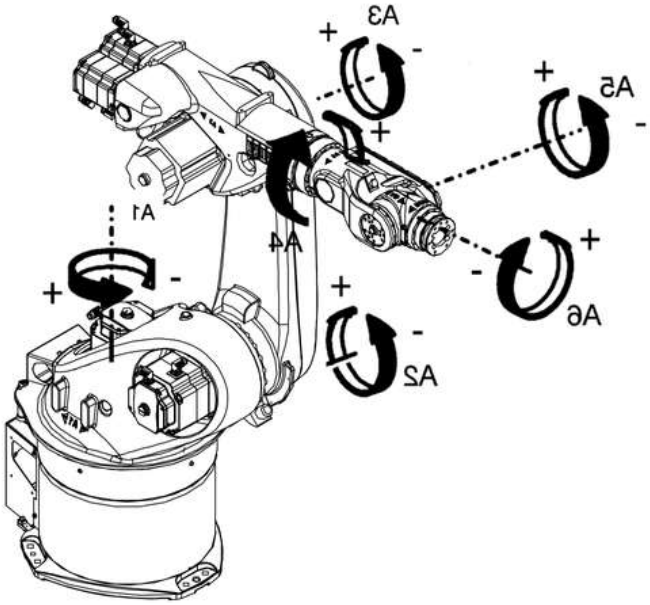
PREREQUISITES

No prerequisites

DURATION

1 day





OBJECTIVES :

- KINEMATIC REPRESENTATION
- CALCULATION OF GEOMETRIC MODELS

M2 - MODELLING

Kinematic chain
- Types of kinematic links / Degrees of freedom / Geometric characteristics

Control modes

Geometric models
- Kinematic diagram / Modified Denavit-Hartenberg parameters / Direct geometric model calculation / Inverse geometric model calculation

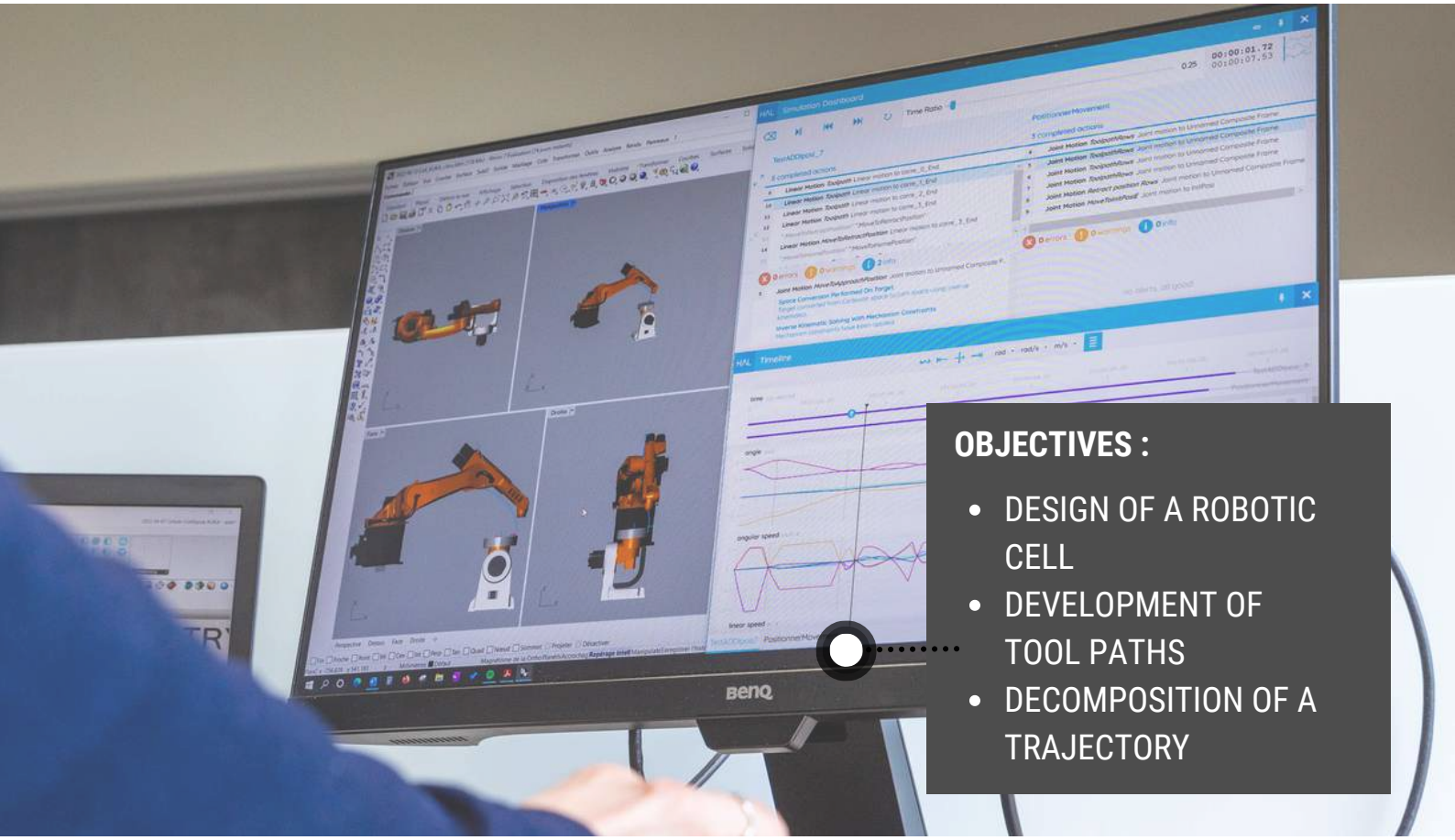
Application on the SCARA robot

PREREQUISITES

No prerequisites

DURATION

5 days



M3 - PATH GENERATION

Programming languages / Programming software
Offline programming steps
Introduction to the RhinoGrasshoper software suite
Cell creation (robot, end-effector)
Movement parameters (PTP, LIN, speed, etc.)
Breakdown of a trajectory (approach, clearance, etc.)
Program generation
Turnkey software (drafting of specifications)

PREREQUISITES

M1 - Generalities in Robotics

DURATION

5 days

KUKA TRAINING BY COMPOSITADOUR

Learn how to control a robot cell in complete safety

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KUKA

OBJECTIVES :

- OPERATE A ROBOT CELL IN COMPLIANCE WITH ROBOT SAFETY RULES
- MOVE THE ROBOT MANUALLY IN ALL AVAILABLE COORDINATE SYSTEMS
- RESTART ROBOT PRODUCTION AFTER A PROGRAMME STOP

M1 - ROBOT OPERATION 1

Safety when using a KUKA robot

- Recognising and avoiding hazards when handling a KUKA robot / Overview of safety features when using KUKA robots

Basic knowledge of how a KUKA robot works

- Brief presentation of the robot system

Moving the robot manually

- Move the robot safely in axis-by-axis mode / Move the robot safely in World, Base or Tool marks

Run programs in manual and automatic modes

- Choose and select the appropriate operating mode / Make the blocks coincide / Select, start and run robot programs / Run a program from a PLC / Restart a program after a fault

Human-machine communication

- Read and interpret system messages / Display the robot's current position

Using the gripper (KUKA.GripperTech)

PREREQUISITES

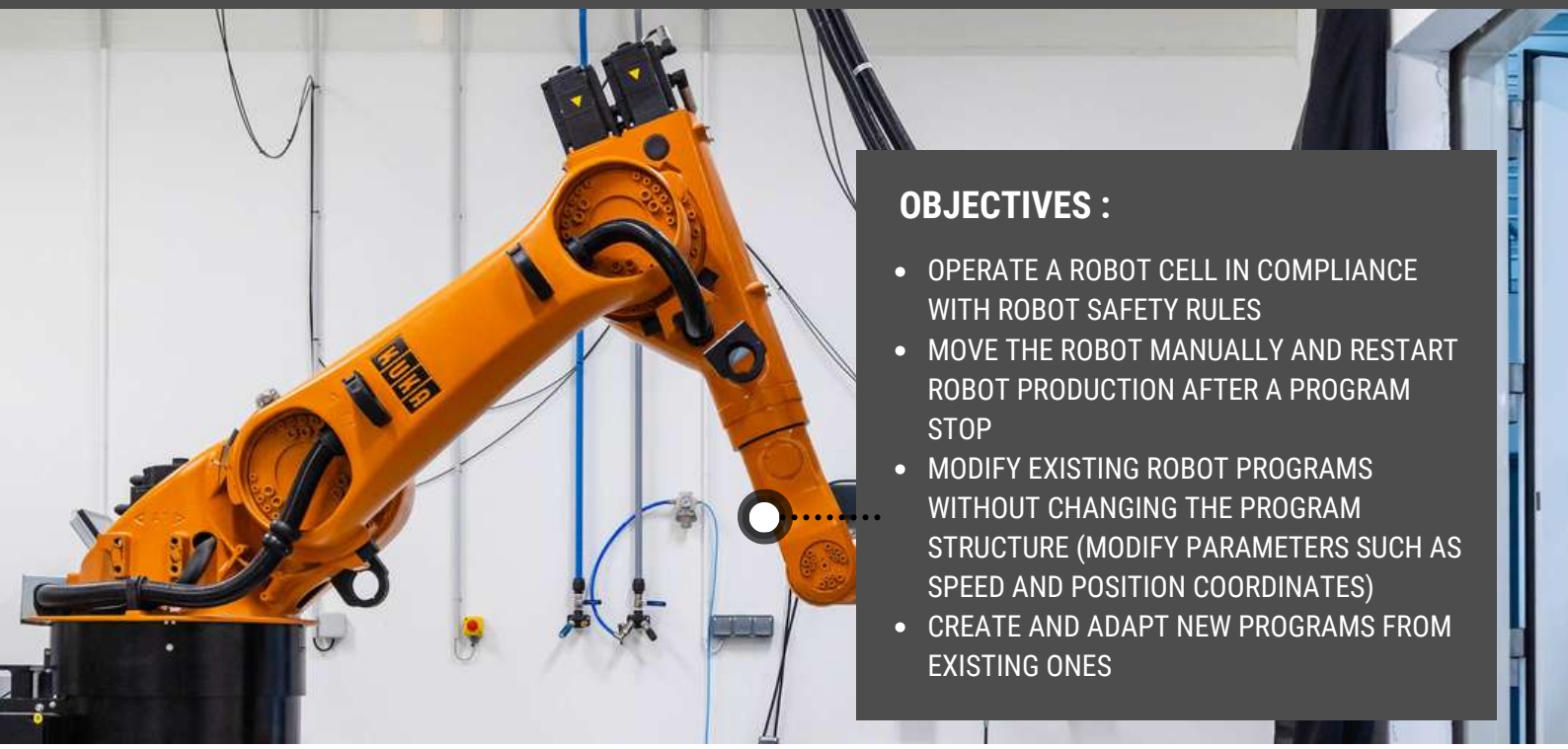
No prerequisites

DURATION

5 days

AUDIENCE

Operators



OBJECTIVES :

- OPERATE A ROBOT CELL IN COMPLIANCE WITH ROBOT SAFETY RULES
- MOVE THE ROBOT MANUALLY AND RESTART ROBOT PRODUCTION AFTER A PROGRAM STOP
- MODIFY EXISTING ROBOT PROGRAMS WITHOUT CHANGING THE PROGRAM STRUCTURE (MODIFY PARAMETERS SUCH AS SPEED AND POSITION COORDINATES)
- CREATE AND ADAPT NEW PROGRAMS FROM EXISTING ONES

M2 - ROBOT OPERATION PRO

Safety when using KUKA robots

- Recognizing and avoiding hazards when operating KUKA robots / Overview of safety facilities when operating KUKA robots

Basic knowledge of the structure of a robot system

Moving the robot manually

- Safe robot retraction, individual axes / Retracting the robot safely with linear motions, in relation to robot, tool and workpiece

Starting and executing robot programs manually and in automatic mode

- Selecting and setting the appropriate operating mode / Performing an initialization run / Selecting, starting and executing robot programs / Executing a program start via a PLC

Human-machine communication

- Displaying and filtering the logbook / Displaying robot states (I/O signals, timers, cyclical flags, counters) / Reading and interpreting robot controller messages / Displaying the current robot position / Displaying saved values (variables) and modifying the values

Use technology packages

- Gripper operation / Programming gripper instructions with KUKA online forms

Working with program files

- Deleting, renaming, duplicating modules / Archiving and restoring programs

Reading structured programs and program flowcharts

Adapting and modifying robot programs

- Creating new motion commands (point-to-point and continuous-path motions) with KUKA online forms / Modifying motion commands / Correcting and adapting positions

Reading and understanding logic commands in existing programs

Principle of mastering and checking the mastering

PREREQUISITES

No prerequisites

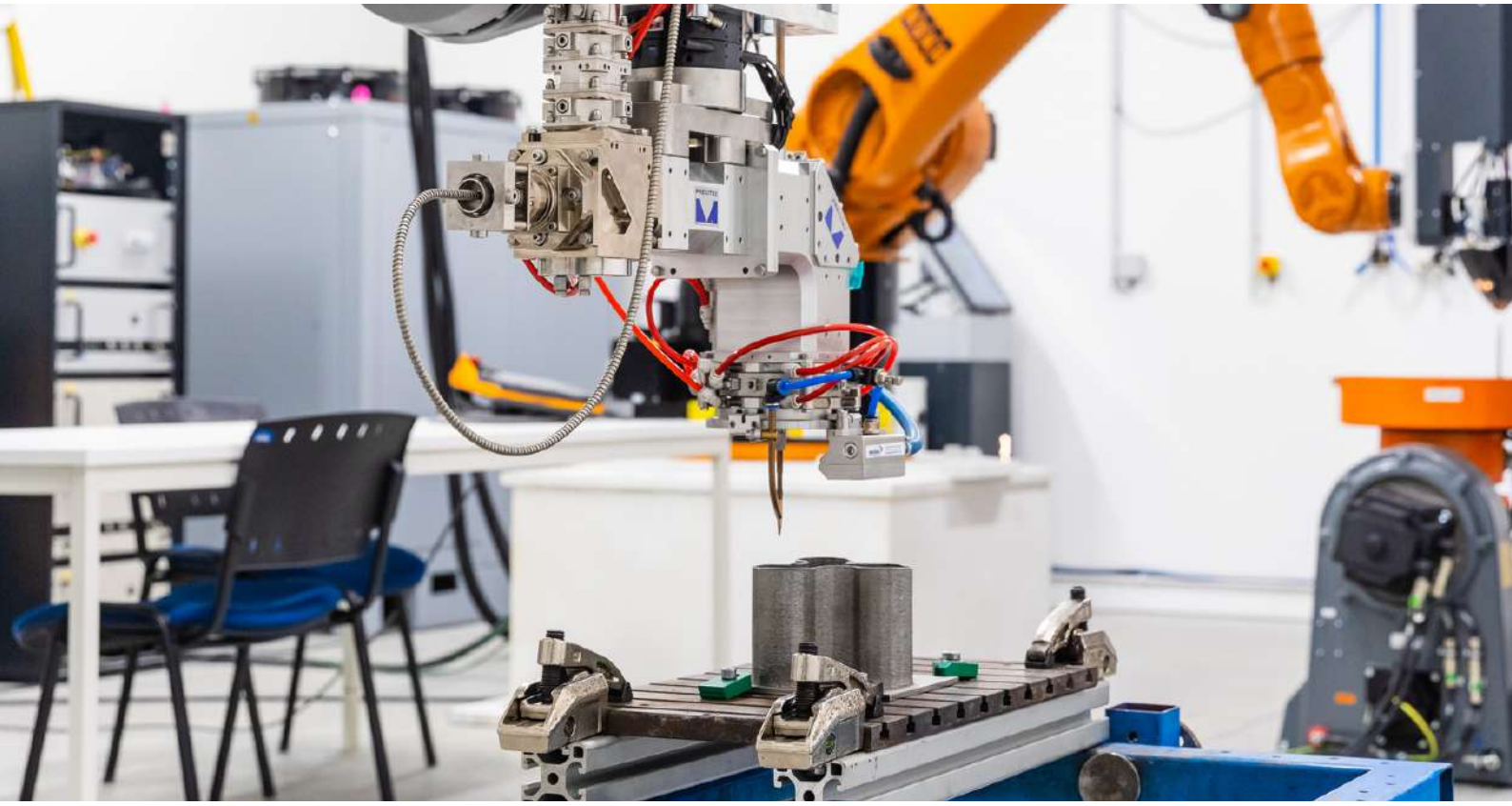
DURATION

4 days

AUDIENCE

Operators

ADDITIVE MANUFACTURING
TRAINING



TRAINING MODULES

M1 - INTRODUCTION TO THE IMPLEMENTATION OF DED TECHNOLOGIES
M2 - ADVANCED WAAM (PREREQUISITE M1)
M3 - ADVANCED DED POWDER (PREREQUISITE M1)
M4 - ADVANCED DED LASER WIRE (PREREQUISITE M1)

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M1 - INTRODUCTION TO THE IMPLEMENTATION OF DED TECHNOLOGIES

Introducing DED technologies

- Describe the possibilities offered by direct energy deposition (DED), wire (WAAM) and powder (BeAM) technologies.
- Understand the advantages/disadvantages of DED technologies
- Understand the ease and difficulty of implementing DED technologies

Designing for DED

- Learn how to design a part for DED manufacturing

Notion of programming

BeAM machine preparation and start-up

WAAM/ DED-Fil Laser preparation and implementation

PREREQUISITES

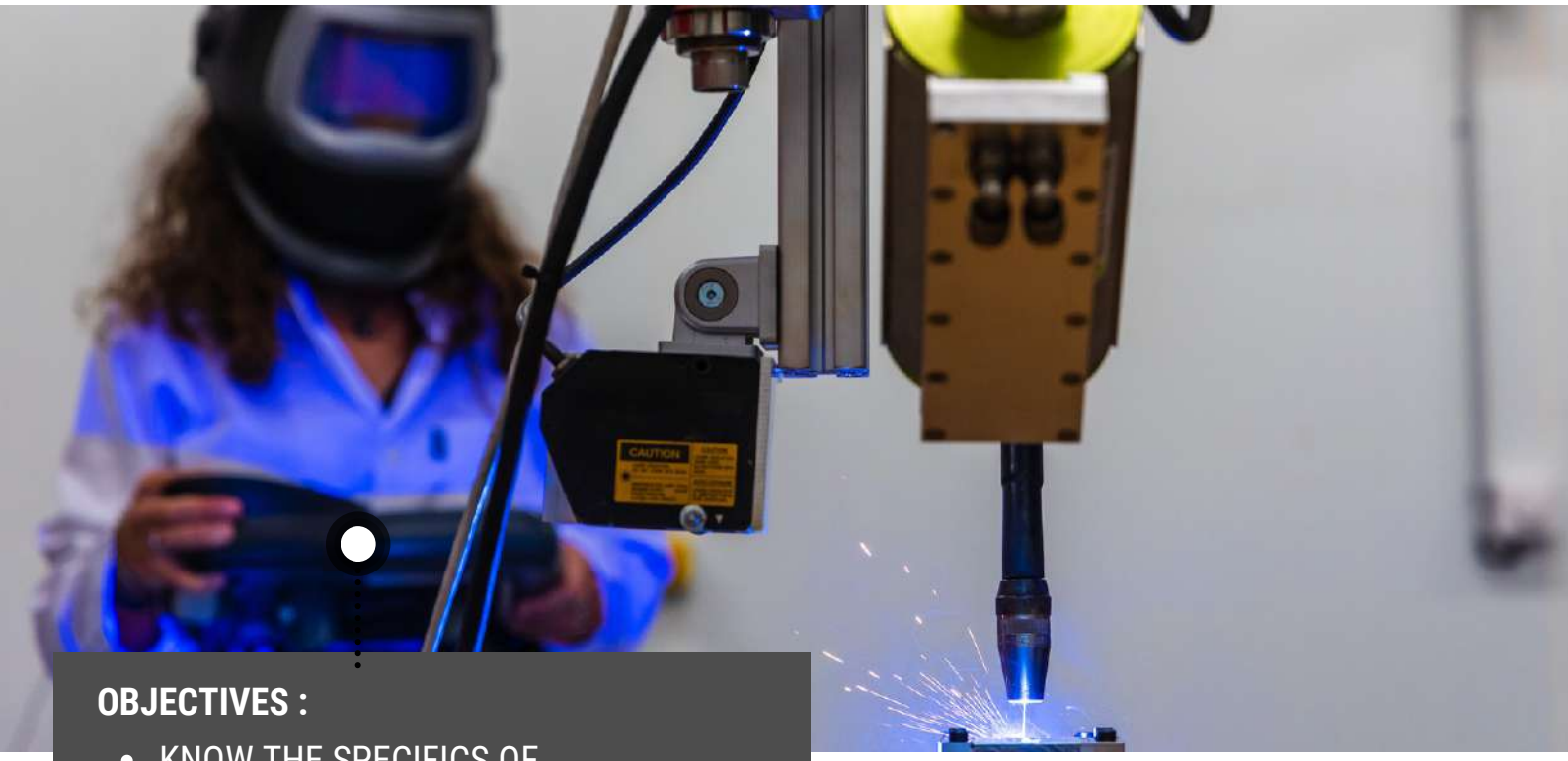
Generalities in Additive Manufacturing

DURATION

2 days

VENUE

Addimadour, Bayonne



OBJECTIVES :

- KNOW THE SPECIFICS OF MANUFACTURING COMPLEX PARTS IN WAAM

M2 - WAAM ADVANCED

Study of design rules / CAD practice on case studies
Robotics basics / Trajectory generation on specific software / Code generation and analysis
Analysis of the various costs involved from design to manufacture
Cell set-up / Robot and WAAM generator preparation
Manufacture of programmed parts
Visual analysis / Macrographic sections

PREREQUISITES

Completion of M1 - Introduction to DED technology implementation

DURATION

3 days

VENUE

Addimadour, Bayonne

OBJECTIVES :

- KNOW THE SPECIFICS OF MANUFACTURING COMPLEX PARTS IN DED-POWDER

M3 - ADVANCED DED POWDER

Study of design rules / Practical application in CAD on case studies
Concept of Gcode / Path generation using specific software / Code generation and analysis
Analysis of the various costs involved from design to manufacture
Preparing the BeAM Magic 800 machine / Safety rules / Setting up production / Using the Siemens 840D interface
Manufacture of programmed parts
Visual analysis / Macrographic sections

PREREQUISITES

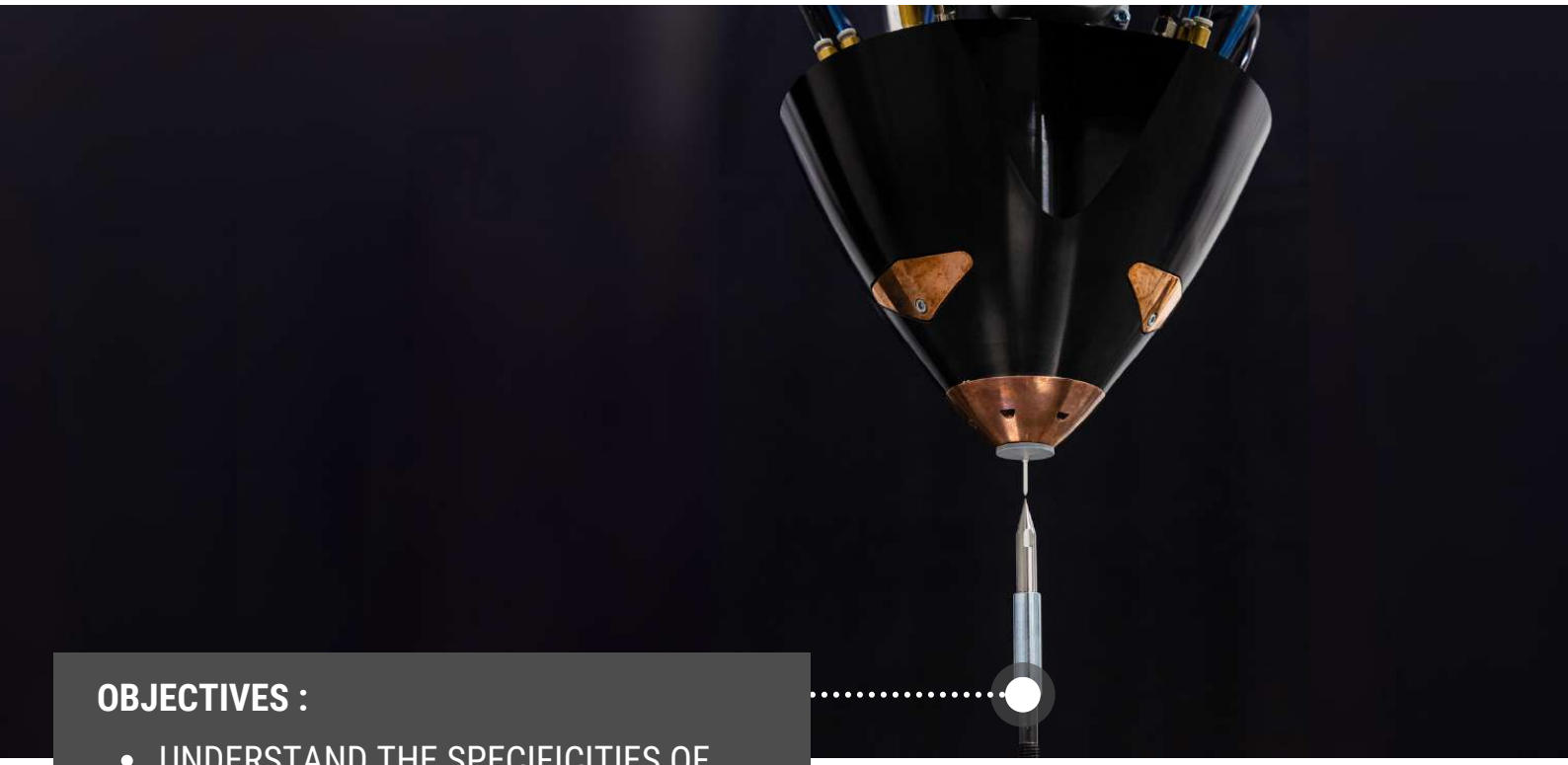
Completion of M1 - Introduction to DED technology implementation

DURATION

3 days

VENUE

Addimadour, Bayonne



OBJECTIVES :

- UNDERSTAND THE SPECIFICITIES OF MANUFACTURING COMPLEX PARTS USING DED LASER WIRE.

M4 - ADVANCED DED LASER WIRE

Study of design rules / Practical application in CAD on case studies
Notion of Gcode and robotics / Trajectory generation on specific software / Code generation and analysis
Analysis of the various costs involved from design to manufacture
Preparing the robot cell / Safety rules / Setting up production (PRECITEC or MELTIO head)
Manufacture of programmed parts
Visual analysis / Macrographic sections

PREREQUISITES

Completion of M1 - Introduction to DED technology implementation

DURATION

3 days

VENUE

Addimadour, Bayonne

MASTER'S DEGREE IN FUTURE PROCESSES AND ROBOTISATION

Initial and continuing training

Become the experts in the use of composites and additive manufacturing for tomorrow's industry

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Euskal Herri

OBJECTIVES

- To train specialists in the implementation of manufacturing processes in the field of composite materials and polymer and metal additive manufacturing in industrial situations.
- A joint approach to materials, processes and robotisation.
- Provide a practical approach and professional skills that can be directly applied in an industrial setting.

MODULES

PROCESS IMPLEMENTATION (35 hrs)

- Process optimisation, material/process interaction.

ROBOTISATION OF MANUFACTURING PROCESSES (70 hrs)

- Robotic cell, adaptation to processes, finishing.

INNOVATIVE MATERIALS (42 hrs)

- Composite, polymer and metallic materials, characteristics specific to their use.

METHODS (84 hrs)

- Decision-making, dimensioning, metrology and control, industrial organisation industrial organisation, composite industrialisation methods and additive manufacturing.

SIMILATION OF ADVANCED MANUFACTURING PROCESSES (28 hrs)

- Mechanical modelling of composite/additive manufacturing processes.

INDUSTRY 4.0 (154 hrs)

- Project management, investment, innovation, cobotics, change management, information systems and cybersecurity.
- Augmented reality, sustainable development and manufacturing, traceability and tracking of parts.

PROFESSIONAL THESIS (840 hrs)

24-week in-company industrial project leading to a dissertation and oral presentation.

PREREQUISITES Master's degree 2
or at least 3 years' professional experience

DURATION 40 weeks in a company
12 weeks training

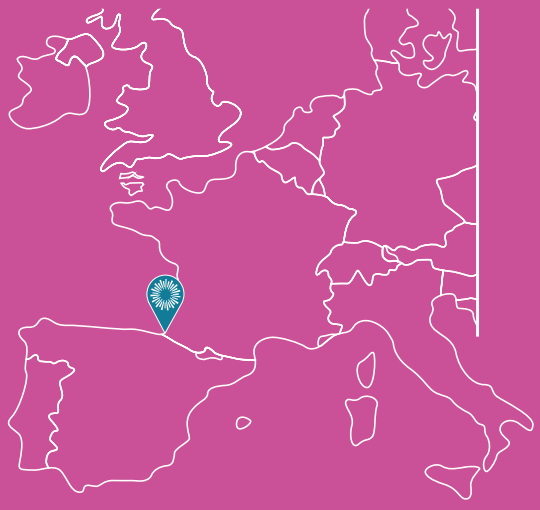
MORE INFORMATIONS :

Training in recent and innovative technologies technologies that will be part of tomorrow's Factory 4.0

Contact us for a tailor-made training programme

contact-compositadour@estia.fr

05 59 44 28 80



adress

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64100 Bayonne - FRANCE

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