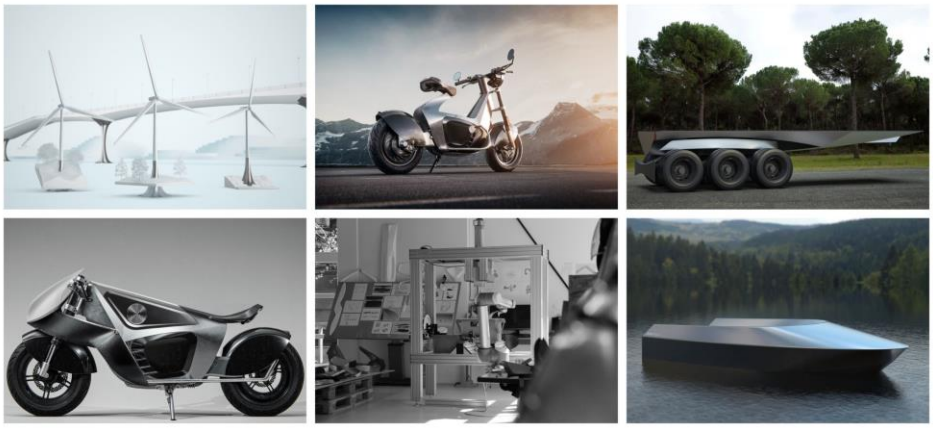
MetaFold Academy

Training Course Outline

MetaFold Academy introduces a cutting-edge learning program on sheet metal manufacturing, centred on the origami inspired STILFOLD technology.

This innovative method involves folding metal sheets into complex structures using advanced manufacturing and software without the need for dies, enabling material and structural optimization. The result is a sustainable, cost-effective, and flexible manufacturing process applicable across industries such as mobility, architecture, aerospace, construction, and consumer goods.



Course Summary

Dive into the latest advancements in sheet metal forming, gaining hands-on experience with STILFOLD technology. Learn how to use STILWARE, a proprietary design software, to create complex, eco-friendly, and high-value metal-folded parts.

Duration

The program is structured into three modules over 18 hours.

- A: Innovation, Sustainability & Sheet Metal (4 hours, Online, Asynchronous)
- B: Realizing the Full Potential of Sheet Metal (6 hours, Online, Asynchronous)
- C: Design Workshop (8 hours, Hands-On, Live)

Who Should Attend?

This course is ideal for engineers, designers, architects, and production or R&D managers involved in high-value industries such as automotive, aerospace, energy, and civil engineering. An engineering background and experience in industrial design or architecture are recommended.

Prerequisites

Participants are encouraged to fulfil the following requirements:

- Knowledge in product development or design.
- Experience in industrial, mechanical design or architecture.
- Fundamental understanding of metal forming processes, processable materials.

Participants that don't fulfil the previous requirements can still attend, but they should be able to fill the gaps in their own time.

Course Materials and Certificate

Individual Module Certification, after successfully completing each Module Overall Certificate for full completion.

Method of Delivery

Training is designed with the needs of the industry professional in mind, being short and intensive. The learning program is delivered both through a blended method, with:

- Two asynchronous, on-demand Modules, with complementary exercises and educational access to software.
- One face-to-face, hands-on, problem-based Module.

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Training Course Syllabus

Module A: Innovation, Sustainability & Sheet Metal (4 hours, Online, Asynchronous)

Session	Learning Outcomes	Topics
Metal & Sheet metal forming overview	Classify and compare traditional forming and sheet metal processes, in terms of their applications, capabilities and limitations. Identify key aspects and considerations of design thinking that relate to environmental impact and sustainability aspects in traditional sheet metal forming.	▪ Forming & Sheet Metal Processes ▪ Applications ▪ Capabilities and Limitations ▪ Environmental Impact
Innovations in Die-less Sheet Metal Forming	Recognize the recent advancements in sheet metal forming technologies, including the need, impact and limitations of flexible die-less forming technologies. Describe the process mechanisms, potential applications and production capabilities of advanced forming technologies, including Multiple Point Forming, Incremental Sheet Forming, Robotic Incremental Sheet Forming and "Industrial Origami" Stilfold curve folding.	▪ Need and Benefits of die-less technologies ▪ Advanced Sheet Metal Technologies overview ▪ Applications of die-less technologies
Sheet Metal Mechanics	Comprehend the fundamentals of metal formability, including the underlying phenomena, deformation mechanics, process, geometric and material parameters, that affect and limit formability.	▪ Deformation Mechanics ▪ Formability ▪ Process Parameters ▪ Compatible Materials/ Material Characteristics
Intro to STILFOLD technology	Explore the principles of Stilfold's industrial origami technology, including the benefits of curve folding over traditional manufacturing methods. Identify potential use cases across different sectors and recognize the business and sustainability implications of adopting Stilfold's industrial origami.	▪ STILFOLD Technology Overview ▪ STILFOLD Process Capabilities & Limitations ▪ Business models ▪ Sustainability implications

Module B: Realizing the Full Potential of Sheet Metal (6 hours, Online, Asynchronous)

Session	Learning Outcomes	Topics
Getting started with STILWARE	Operate the STILWARE software to perform basic design tasks utilizing basic software functions and tools. Integrate STILWARE in conjunction with other CAD/CAM software to streamline the overall design and manufacturing progress. Demonstrate advanced design techniques including simulation of complex folds, stress analysis and material optimization techniques, through STILWARE.	▪ Setup and Overview of the STILWARE user interface. ▪ Basic functions and tools. ▪ Advanced Design and Simulation ▪ Advanced folding techniques and their applications. ▪ Simulating complex folds and stress analysis. ▪ Optimization techniques for weight and material use. ▪ Integrating with Other Tools, Importing and exporting designs to/from other CAD software. ▪ Using STILWARE in conjunction with CAM software. ▪ Case studies of integrated design processes.
Real-world Applications	Explore, discuss and evaluate real-world products including STILRIDE 1 and other applications across various industries.	▪ Detailed study of STILRIDE 1 and other products using STILWARE. ▪ Exploring potential applications in various industries (automotive, aerospace, architecture) ▪ Guest lecture from an industry expert.
Design Project	Design, prototype, test and analyze a simple folded structure using STILWARE and cardboard folding exercises.	▪ Assignment: Design a simple structure using STILWARE. ▪ Cardboard folding Prototype ▪ Peer review and feedback session.

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Training Course Syllabus

Module C:
Design Workshop
(8 hours, Hands-On, Live)

Session	Learning Outcomes	Topics
Hands-on Workshop	Design complex real-world components, through collaborating on a design group project, reinforcing and applying previously gained knowledge on industrial origami..	▪ Short Recap of previous Modules. ▪ Deep dive into advanced design principles. ▪ Hands-on design session using STILWARE. ▪ Practical Design Workshop project initiation: Design a real-world component.
Prototype Development	Translate digital designs into physical prototypes using CAM instructions and industrial robots, adhering to capabilities and limitations of the Stilfold technology, using STILWARE. Apply principles of design for manufacturability and assembly in the context of Stilfold technology. Test prototypes in terms of strength, durability, and efficiency, and make iterative design improvements, guided by peer and expert feedback	▪ Translating designs into physical prototypes. ▪ Use of CAM instructions for automated folding and forming. ▪ Working with industrial robots for manufacturing. ▪ Testing and Optimization ▪ Testing prototypes for strength, durability, and efficiency. ▪ Iterative design improvements based on test results. ▪ Final adjustments and optimization techniques.
Presentation and Evaluation	Present designed components to peers and instructors for evaluation. Evaluate the impact of design decisions on the manufacturability, performance and sustainability of real-world products.	▪ Group presentations of the designed components. ▪ Evaluation by peers and instructors. ▪ Certification ceremony and course feedback.

After Course Support

After the end of the learning program participants can get support using the following ways:

- Access to Online forum and discussion boards for continuous learning.
- StilWARE educational license for one month after the program ends.
- Access to recorded lectures and supplementary materials.
- Optional mentoring sessions.

General Information

MetaFold Academy has been co-created by the original technology IPR Stilfold (SE), and the involvement of R&D organizations, training experts and industrial partners, including Volvo (SE), MADE Competence Center (IT), Pannon Business Network (HU) and the Teaching Factory Competence Center (GR).

Online courses will be hosted on EITM Academy, while hands-on training will be provided by a network of four training centers across four EU countries: Stilfold (SE), MADE CC (IT), PBN (HU) and TF-CC (GR).

Further Information

- LinkedIn
- Website

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