



STRENGTHENING INNOVATION, DIGITAL COMPETENCIES & INDUSTRY-ACADEMIA COLLABORATION

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Technical University of Cluj-Napoca

Consolidation of the Development
Framework for International University
Programs through the Integration of
Education 5.0



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Funding Program: Erasmus+ KA220-HED – Cooperation Partnerships in Higher Education

Strengthening Innovation, Digital Competencies & Industry–Academia Collaboration

Consolidation of the Development Framework for International University Programs through the Integration of Education 5.0

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Implementation Period: 01.10.2025 – 30.09.2028

Coordinated by Technical University of Cluj-Napoca

Funded by the European Union



ABOUT THE PROJECT

This Erasmus+ initiative brings together academic institutions, students, teachers, and industry partners to modernize learning practices and strengthen links between education and the labor market. CODEPIE5.0 acts as a highly structured strategic framework designed to modernize higher education paradigms within bachelor's programs in Mechatronics, Manufacturing Engineering, and Mechanical Engineering taught in German.

The project focuses on integrating digital tools, improving curriculum design, and creating sustainable collaboration frameworks with industry. Rooted in the principles of Education 5.0, this blueprint goes beyond basic digitization towards a human-centric, societal-focused setup.

Over a three-year implementation period backed by a 250,000 Euro budget funded by the European Union, the project builds a robust operational landscape, where aligned academic curricula, virtual pedagogical tools, and soft-landing metrics blend into an innovative template for engineering education.

Industry-Academia Interlock

By synchronizing elite technical universities directly with real-world industrial leaders like Gühring company, CODEPIE5.0 ensures that academic qualifications perfectly match European market needs and technological shifts.

MAIN OBJECTIVES

The broad objectives of CODEPIE5.0 are systematically structured to generate deep impacts across partner universities, student cohorts, faculty, and the industrial engineering sector through five foundational pillars:

- **Introduce Innovative Methods**

Improve the quality of education by introducing innovative teaching methods and digital learning tools. This involves modernizing technical coursework using an interactive platform.

- **Strengthen Industry Ties**

Strengthen cooperation between universities and industry partners to ensure real-world relevance in curricula, turning academic tracks into co-designed training pathways.

- **Support Student Development**

Support student development through exposure to industry expectations, digital technologies, and innovation-driven learning frameworks that bridge theoretical gaps.

- **Promote Sustainability**

Promote sustainability by embedding environmentally responsible practices into teaching and training activities, preparing engineers for actual and future industrial realities.

- **Encourage Cross-Border Collaboration**

Encourage cross-border collaboration through joint activities, events, and knowledge exchange between partner institutions to expand European integration.

By addressing these core axes, the project systematically aligns regional mechatronic and mechanical engineering curricula with modern labor demands, establishing transparent credit validation models across national borders.

Core Pillars and Vision

CODEPIE5.0 aims to modernize mechanical engineering education and align it with modern labor demands across Europe by introducing innovative digital tools, strengthening industry ties, supporting student development, promoting sustainability, and fostering cross-border collaboration.



KEY ACTIVITIES

1. Curriculum Modernization

- Integration of digital learning tools to enrich technical learning environments.
- Inclusion of industry feedback to dynamically align/adapt mechanical engineering topics.
- Development of updated learning modules designed around Education 5.0 requirements.

2. Collaborative Workshops & Webinars

- Sharing best practices in digital education among participating universities.
- Presenting project results to academic stakeholders and public institutions.
- Networking between academia and industry to catalyze joint educational frameworks.

3. Development of Educational Resources

- Digital platform and tools, including custom virtual pedagogical environments and the Virtual Teacher.
- Guidelines for innovative teaching to empower faculty in digital delivery methods.

4. Dissemination & Outreach

- Website development initiated early to serve as an open-access repository.
- Social media campaigns to systematically maximize regional outreach.
- Brochures, newsletters, and visibility materials to engage stakeholders across Europe.

Translating Theory into Action

The operational framework of CODEPIE5.0 translates pedagogical theory into actionable deliverables by modernizing mechanical engineering curricula with Education 5.0 modules, creating innovative digital tools such as a Virtual Teacher, and fostering stakeholder collaboration through workshops and strategic European outreach actions.

BENEFICIARIES & EXPECTED IMPACT

CODEPIE5.0 is designed to deliver immediate benefits to a wide range of stakeholders within the higher education and industrial manufacturing systems.

Who Will Benefit?

- **Students.** Both undergraduate and graduate engineering students gain advanced digital skills, industry exposure, and fluid mobility pathways.
- **Teachers & Trainers.** Academic faculty acquire advanced digital teaching competencies and modernized pedagogical toolkits.
- **Researchers & Academic Staff.** Gain access to collaborative cross-border research networks and standardized calibration frameworks.
- **Industry Professionals.** Benefit from a pipeline of highly skilled, bilingual graduates tailored to market needs.

Expected Impact

- **Improved Student Employability.** Graduates enter the marketplace with the specific language, technical, and digital competencies required by leading employers.
- **Stronger Education-Industry Links.** Establishing a reliable co-design mechanism between universities and companies like Gühring.
- **Greater Digital Readiness of Institutions.** Partner universities upgrade their operational infrastructure with functional learning platforms.
- **Sustainable International Networks.** Creating long-term partnerships through joint courses and automated ECTS recognition frameworks.
- **Long-Term Resource Use.** The learning resources, guides, and tools developed will remain active well beyond the official funding lifecycle.

Sustainable Academic–Industrial Synergy and Stakeholder Value

The CODEPIE5.0 project creates a mutually beneficial system for students, faculty, researchers, and industry professionals by driving institutional digital readiness and establishing co-designed training frameworks that directly elevate graduate employability in the advanced manufacturing sector.

PROJECT IMPLEMENTATION TIMELINE

To guarantee the execution over the 36-months runtime (01.10.2025 to 30.09.2028), the project structure organizes tasks into interdependent Work Packages (WPs).

Work Package / Associated Tasks	Start	End	Primary Venue
WP1 Project Management	10/1/25	10/1/28	Online / Onsite Framework
General Project Coordination	10/1/25	10/1/28	Online / Onsite Meetings
Monitoring & Progress Evaluation	10/1/25	10/1/28	Online / Onsite Meetings
WP2 Digital Learning Platform	10/1/26	10/1/28	Digital Space
Design & Development of Modules	10/1/26	9/1/28	Online
Digital Platform Technical Development	4/1/27	9/1/28	Online
Testing and System Integration	10/1/27	10/1/28	Online
Intercultural Activities & Mobility	3/1/26	10/1/28	Multi-Centric
Soft Landing & Adapting Guides	3/1/26	12/1/26	Online
Intensive Academy Sessions	10/1/26	10/1/28	Cluj-Napoca, Stuttgart, Graz, Sofia
Language Café Sessions	11/1/26	9/1/28	Cluj-Napoca, Stuttgart, Graz, Sofia
WP4 Curricula Alignment & micro-ECTS	3/1/26	6/30/27	Regional Academic
Consulting for Best Practices	3/1/26	3/30/27	Cluj-Napoca
Review & Adaptation of Curricula	4/1/26	6/30/27	Cluj-Napoca
Credit Recognition Framework Creation	3/1/26	9/30/26	Graz
WP5 Dissemination & Exploitation	10/1/25	9/30/28	Multi-Centric
Promotional Materials & Distribution	10/1/25	6/30/28	Cluj-Napoca, Stuttgart, Graz, Sofia
Workshops & Seminar Dissemination	4/1/26	9/30/28	Cluj-Napoca, Stuttgart, Graz, Sofia

Project implementation

The implementation plan defines the operational framework for achieving the objectives of the Erasmus project over the project duration. It outlines the implementation strategy, key milestones, partner responsibilities, and mechanisms for monitoring, evaluation, and sustainability.



QUANTITATIVE AND QUALITATIVE INDICATORS

To ensure strict quality control and accountability, CODEPIE5.0 defines clear performance indicators for all activities.

WP1 Management: Tracking the frequency of organized management meetings, the overall activity implementation rate, and the annual completion of progress reports and risk assessments.

WP2 Digital Platform: Monitoring the volume of interactive educational resources created, target user adoption rates, the deployment of key platform functionalities, and the execution of test sessions focused on technical bug resolution.

WP3 Mobility & Culture: Assessing the distribution of adaptation guides, the organization of student orientation sessions, the implementation of Intensive Academy and Language Café sessions to engage project participants and boost student participation in exchanges across partner universities.

WP4 Curriculum Alignment: Evaluating the number of revised courses implemented across participating institutions using standardized credit recognition rules.

WP5 Dissemination: Measuring the distribution of print brochures and online shares, the launch and unique visitor traffic of the dedicated project website, the promoting of social media campaigns, and the hosting of dissemination events to gather attendees.

Project Summary

The project's work milestones focus on ensuring robust project management, developing an interactive digital educational platform, coordinating student mobility and cultural exchanges, aligning university curricula across partner institutions, and maximizing regional visibility through diverse dissemination channels.

INSTITUTIONAL CONSORTIUM

The CODEPIE5.0 consortium unites prominent European academic institutions and industrial partners across Romania, Germany, Bulgaria, and Austria to collaboratively modernize mechatronic mechanical engineering education and bridge the gap between academic training and modern labor market demands.



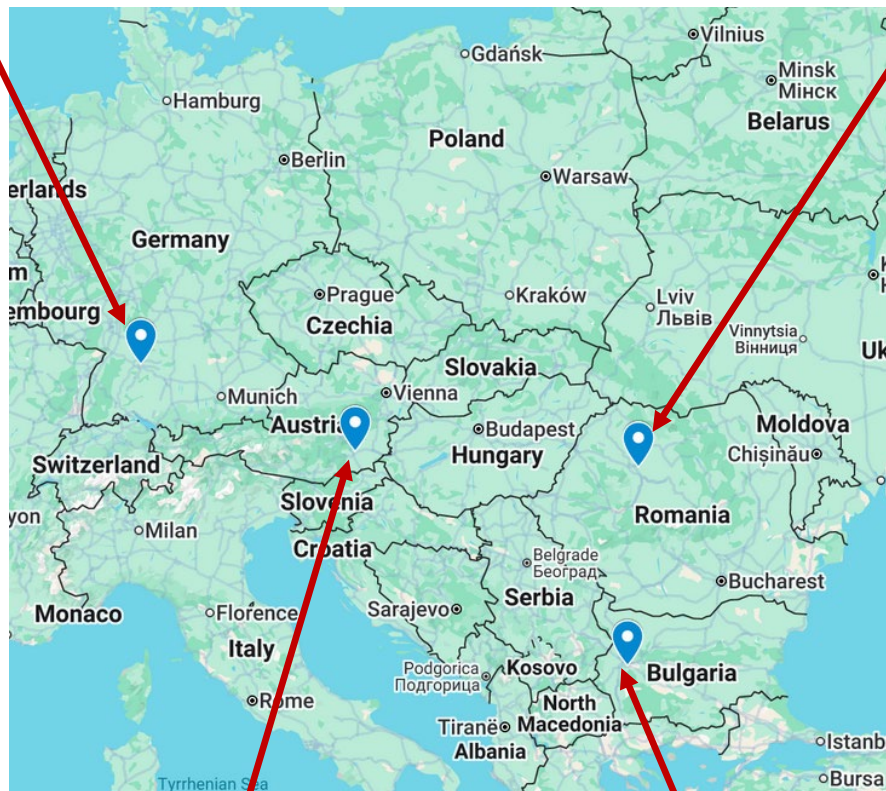
- University of Stuttgart, Germany
www.uni-stuttgart.de



- Technical University of Cluj-Napoca, Romania (Project Coordinator)
www.utcluj.ro



- Gühring Company, Cluj-Napoca, Romania
www.guehring.ro



- CAMPUS 02 Fachhochschule der Wirtschaft, Austria
www.campus02.at



- Technical University of Sofia, Bulgaria
www.tu-sofia.bg

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