

Promoting Engineering Education Excellence - the NextGEng Project

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NextGEng Project

- ❑ **Project Type** - Cooperation Partnerships in Higher Education - KA220-HED
- ❑ **Title** - International Cooperation Framework for Next Generation Engineering Students [NextGEng]
- ❑ **Coordinator** - Technical University of Cluj-Napoca
- ❑ **Budget** - 400.000 Euro
- ❑ **Time frame** Oct 2022 – Sept 2025 (36 months)
- ❑ **Website** www.nextgeng.eu



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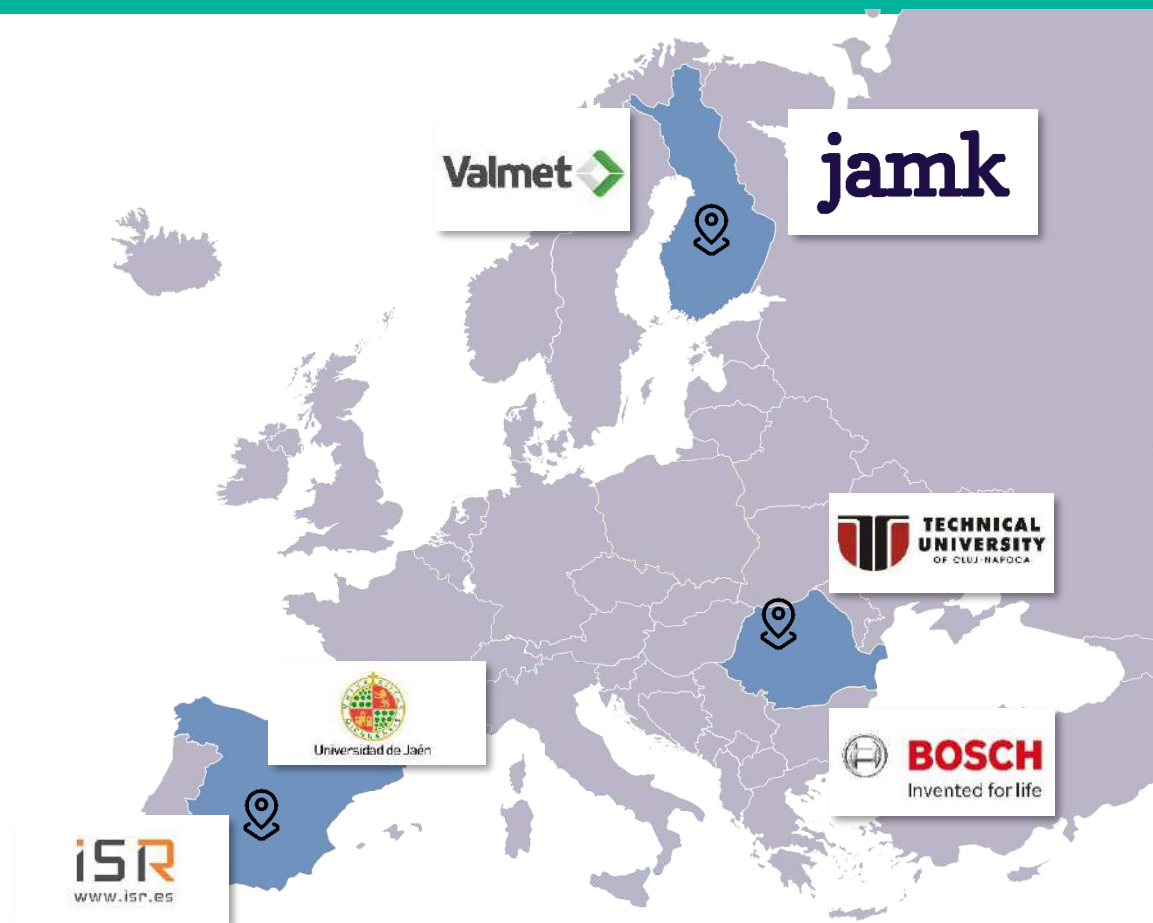
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NextGEng Project

□ Consortium partners

- Co - Technical University of Cluj-Napoca (Romania)
- P1 - JAMK University of Applied Science (Finland)
- P2 - University Of Jaen (Spain)
- P3 -Integración Sensorial y Robótica (Spain)
- P4 - Valmet Technologies (Finland)
- P5 - Robert Bosch Cluj Plant (Romania)



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Valmet



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Project Objective

- ❑ The aim of NextGEng is to **develop an international cooperation framework** between consortium partners that **promote international team-teaching** with the support of **new learning material and teaching methods** that are aligned with the European Education Area 2025 and are in accordance with labor market needs.



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Project beneficiaries

❑ Target groups

- HEI students

❑ Needs addressed

- collaboration with industry as part of the curricula activities
- courses learning outputs/ competences adapted to the labor market needs
- learning and working in an international environment
- increase the content quality of courses (integrates state-of-the-art topics in engineering, integrates examples of applied theory in real study cases from industry)



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Project beneficiaries

❑ Target groups

- HEI students
- HEI teachers

❑ Needs addressed

- exchange experience (teaching & research) with European teachers in the same engineering field
- close collaboration with industry in education and research
- create new course content that is aligned with the latest industry development
- increase students' motivation to actively participate in the course and laboratory activities



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Project beneficiaries

☐ Target groups

- HEI students
- HEI teachers
- Company experts

☐ Needs addressed

- develop new competences in their field of activity
- get in touch with potential new collaborators in HEIs
- identify potential new employees from the HEI students



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NextGEng Work Packagase

☐ Lines of action:



Training

Tailored training program for teachers that sustain the skill improvement of HEI partners staff in new/innovative teaching methods.



International Team-Teaching

International Team-Taching Pilot Program.
Upgrade a set of engineering courses, belonging to the HEI partners curricula, in close collaboration with companies' partners.



CEL Projects

Cases of Experiential Learning projects.
Type of projects where students learn by doing in an international and multidisciplinary environment.



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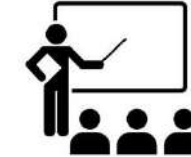
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International team-teaching pilot program

1. Tailored Training Process

- Jan 2023
- Organized by P1-JAMK



2. Course upgrading process (Round 1) [C1...C4]

- Feb - Sept 2023
- CO-TUCN, P1-JAMK, P2-UJA, P3-ISR, P4-Valmet, P5-Bosch



3. Implementation of the Team-Teaching Pilot Program

- Sept 2023-June 2024
- CO-TUCN, P1-JAMK, P2-UJA



4. Course upgrading process (Round 2) [C5,C6]

- Feb - Sept 2024
- CO-TUCN, P1-JAMK, P2-UJA, P3-ISR, P4-Valmet, P5-Bosch



5. Implementation of the Team-Teaching Pilot Program

- Sept 2024-June 2025
- CO-TUCN, P1-JAMK, P2-UJA



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Tailored Training Process

❑ 1st Training round

- initial **Training Program** for the **teachers** that participate in the project
- Organizer: Jamk University of Applied Sciences
- Period : 30 – 31 Jan 2023
- Participants: 29 teachers (TUCN, JAMK & UJA)

C1 – Strength of Materials; C2 – Industrial Automation;

C3 – Design Projects; C4 – Quality Assurance and Applied Methods;

C5 – Computer Aided Design ; C6 – Manufacturing Technology



Jyvaskyla, Jan 2023



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Tailored Training Process

❑ Planned activities, Day 1:

- Current status in partner universities - Summary of the survey and pre-assignments
- Planning, implementing and assessing courses in a student-centered way
- Development of particular implementation solutions for student-centered learning in pilot courses and the possibilities for joint implementation
- Social event – networking with dinner



Jyväskylä, Jan 2023



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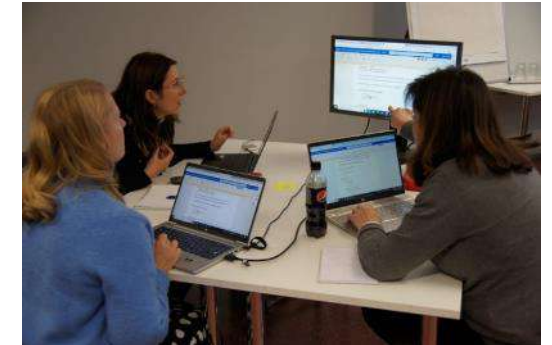


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Tailored Training Process

❑ Planned activities, Day 2:

- Planning the international co-teaching for the subject area and increasing the student-centered orientation of the course
- Companies on stage - Opportunities and plans for co-operations to participate in the study courses
- Visit to Jamk DigiCenter – development of digital learning material
- Group presentations of the workshop results



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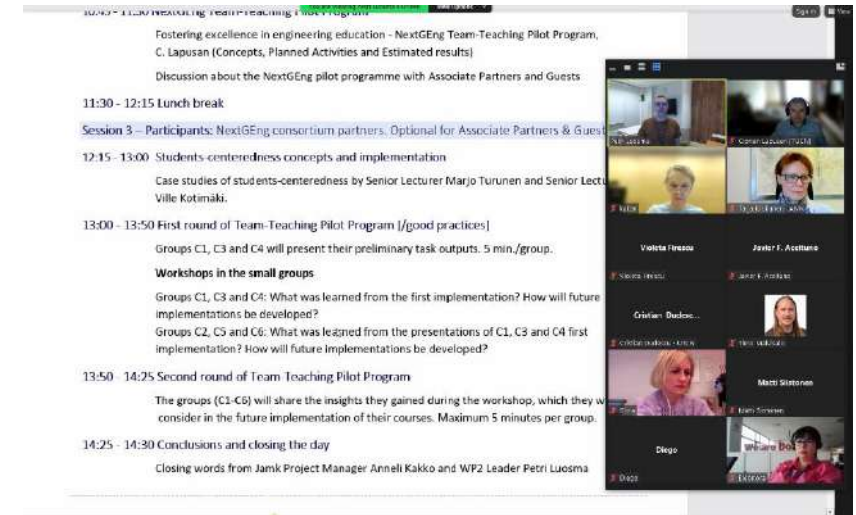
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Tailored Training Process

❑ 2nd Training round

- Organizer: Jamk University of Applied Sciences
- Period : 22 Feb 2024
- Participants: 36 teachers , company experts, associate partners
- Topics:
 - Result evaluation and good practices of the NextGEng Team-Teaching Pilot Program first round
 - Students-centeredness concepts and implementation – case studies
 - Planning of Second round of Team-Teaching Pilot Program



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International team-teaching pilot program

- The **ITT pilot program** supports the development of an **international teaching framework** where teachers and industry experts collaborate in the **development of new course content** and **specific teaching methods for engineering**.



Six upgraded joint courses (C1-C6)

- C1 – Strength of Materials
- C2 – Industrial Automation
- C3 – Design Projects
- C4 – Quality Assurance and Applied Methods
- C5 – Computer Aided Design
- C6 – Manufacturing Technology



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International team-teaching pilot program

❑ Development of new course content

- ✓ **Modularity of contents and levels** - for each joint **course modules are defined**, facilitating in this way the **team-teaching process** and allowing flexible content implementation each course in all HEIs
- ✓ **Student-centered elements** - develop new content that put students at the center of learning process and make use of experiential learning in close collaboration with real life case studies from industry
- ✓ **Eco-friendly concepts** - new eco-friendly concepts are integrated in the course content that aim to raise awareness to students on the influence/impact on environment based on their decisions in the design and life span of a certain engineering product
- ✓ **Material compatible with digital teaching and learning**



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International team-teaching pilot program

Teaching methods applied for engineering learning process

- ✓ Co-teaching/cooperative teaching
- ✓ Blended learning as part of cooperative teaching
- ✓ Student centered teaching
- ✓ Project-based learning
- ✓ Digital teaching and learning



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International team-teaching pilot program

- Course & laboratory activities in the first round (academic year 2023-2024)



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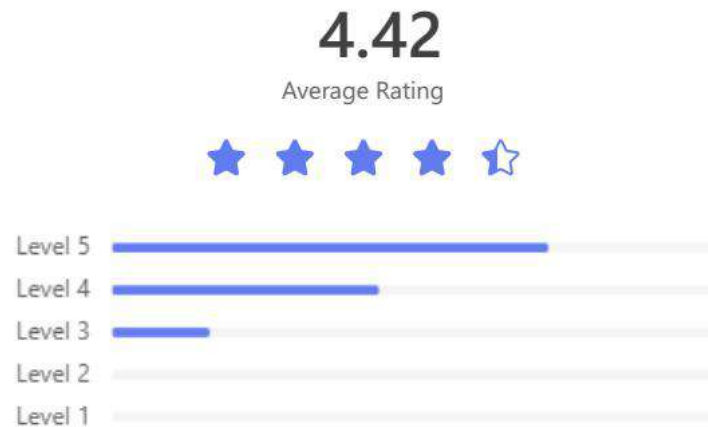
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International team-teaching pilot program

❑ Results for the Course & laboratory activities in the first round

16. Rate your overall experience at the course considering the following aspects:

- learning outcomes
- course content and quality of the teaching materials
- internationalization
- teaching methods used at the course



12. Rate your overall experience after participating at the laboratory.



▪ Feedback: 169 students



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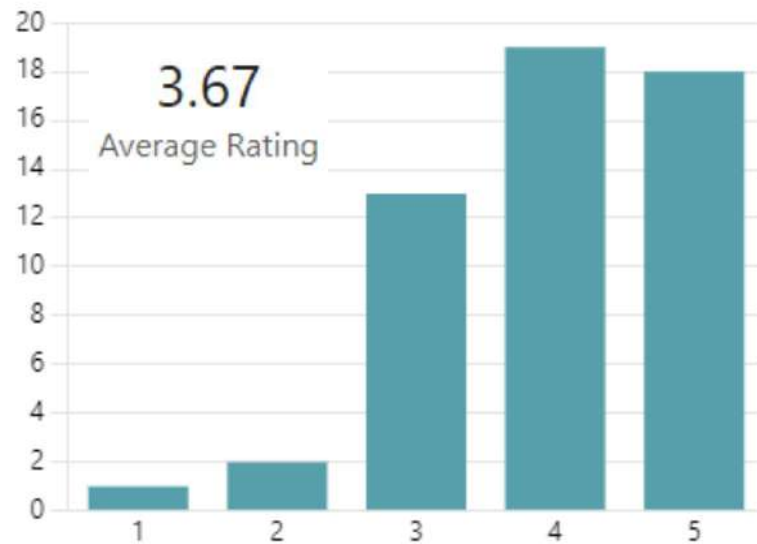


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International team-teaching pilot program

- Results for the Course & laboratory activities in the first round
 - Feedback from students from C1..C6, academic year 2022-2023



Control group feedback (course & laboratory)



International team-teaching pilot program

- Course & laboratory activities in the first round (academic year 2023-2024)



*"It has been **one of the best laboratories I have ever taken**. The fact that we could apply the theoretical knowledge on industrial PLCs was absolutely great. **I wish there were more practical activities that are industry related**"*



*"It was a **great experience**. I look forward to another one"*



*"It was an **educational experience in which I learned new things and new aspects**"*



*"It was great but hopefully we can do **laboratory live** all together next time"*



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International team-teaching pilot program

- Course & laboratory activities in the first round (academic year 2023-2024)



*"It was **very educational and helped us getting more knowledge** on quality and metrology"*



*"Nothing to add, it was a **great experience**"*



*"The course **was very engaging, and the material was interesting**. The visiting professors did a very good job keeping us (students) engaged through the whole course and the fact that they showed us what a typical exam problem in Jaen looks like was a huge bonus. I don't think any improvement is necessary.*



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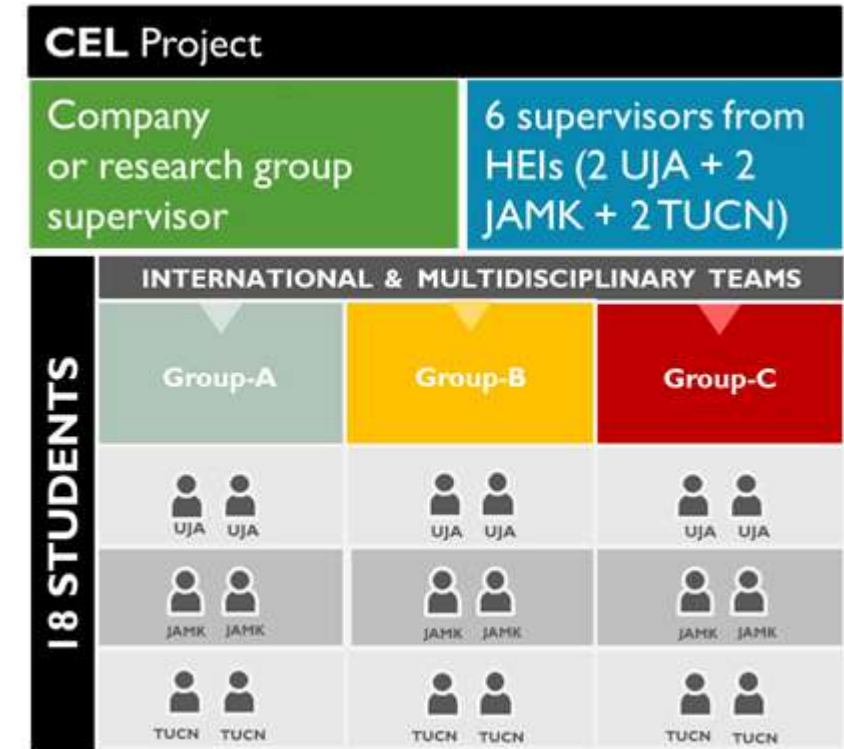
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Cases for experiential learning projects

- CEL projects are **project-based learning activities** that are designed in collaboration with **companies** and **HEIs research groups**
- facilitate **close cooperation** between students, HEI staff, researchers, and industry experts on **real-life industrial/research project topics**
- Two rounds of projects
 - 3 projects proposed by research groups from UJA, JAMK and TUCN
 - 3 project proposed by companies: ISR, Valmet and Bosch



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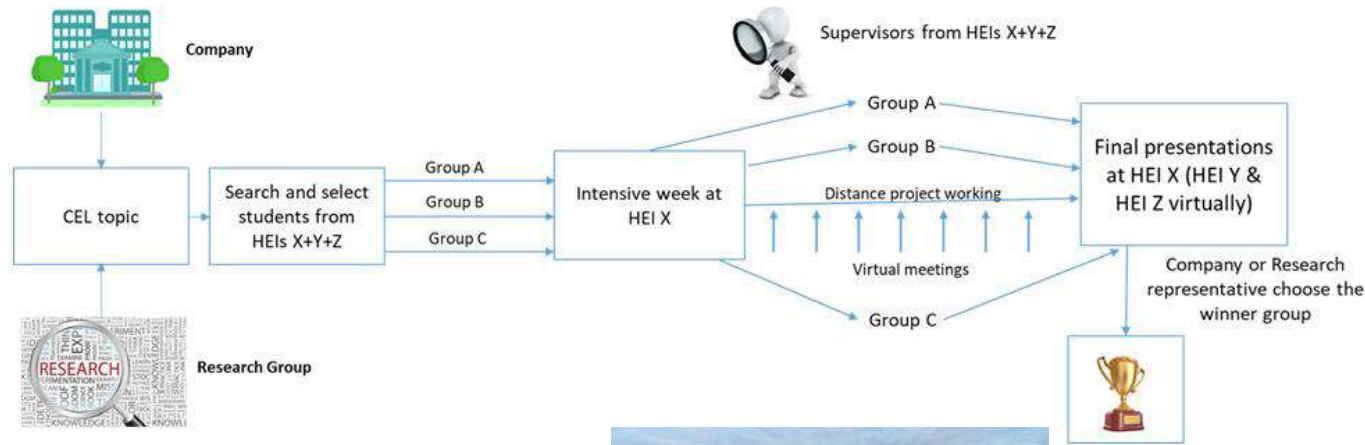
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Cases for experiential learning projects



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NextGEng Publications



❑ Scientific Papers

- Satorres-Martínez, S., et al, Sharing strengths to improve international collaborative learning and teaching processes in higher education: the NextGEng project, INTED2023 Conference, Valencia, Spain, 4-6 Mar. 2023.
- Anneli KAKKO , International Cooperation Framework For Next Generation Engineering Students, SEFI 2023 Conference, Dublin, Ireland, 11-14 Sep. 2023.
- Dorado-Vicente, et al, The NextGEng Project: First Steps of an International Co-Teaching Experience, INDOTEC 2023 Conference, Granada, Spain, 26-27 Oct 2023.
- Martínez, S. S., Gila, D. M., Vicente, R. D., Rad, C., & Lapusan, C. Experiencia de coenseñanza internacional en asignaturas de Automática en el marco del proyecto europeo NextGEng. Jornadas de Automática, (45), 2024.
- Dorado-Vicente, R., et. al., The NextGEng Project: First Steps of an International Co-Teaching Experience. VI Jornadas Internacionales en Innovación Docente en las titulaciones técnicas, 2024.



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Valmet

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Project website & social media



NextGEng Project is an international consortium consisting of 3 universities and 3 companies, with the aim of creating new pedagogical models that promotes international team-teaching with the support of new learning materials for existing courses in the curricula.

The new course materials integrate student-centered approaches which make use of experiential learning in close collaboration with real-life case studies developed with the industry partners.

[READ MORE](#)

NextGEng comprises three types of activities



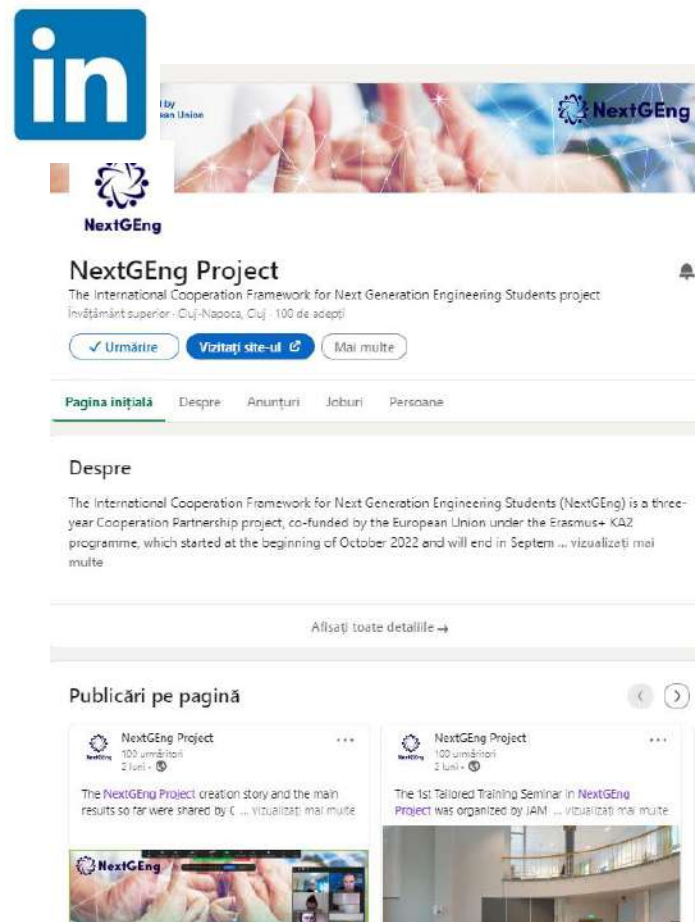
<https://nextgeng.eu/>



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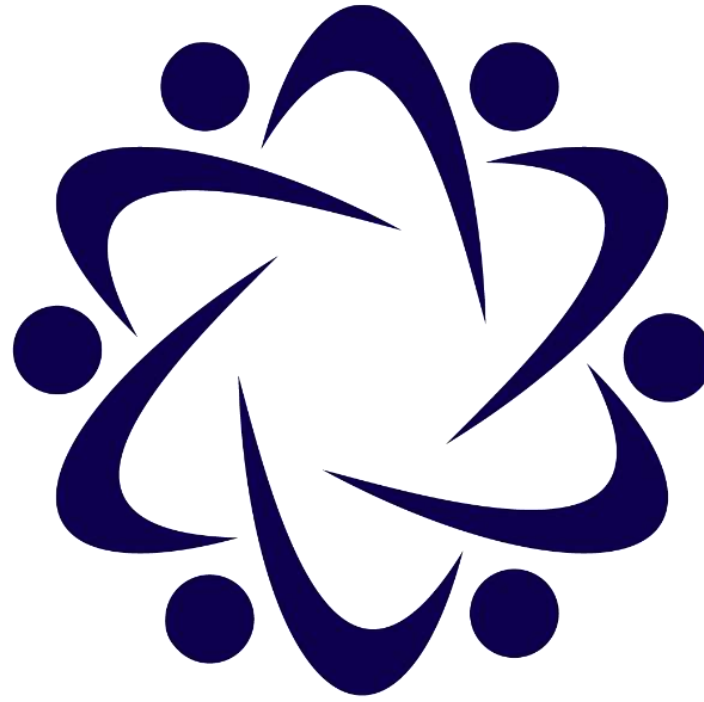
<https://www.linkedin.com/company/nextgeng-project>



<https://www.facebook.com/NextGEng.eu/>

Thank you!

Gracias!



Kiitos!

Multumesc!

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