

New European Bauhaus objectives and related impact in Civil Engineering education

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Global sustainability: challenge or opportunity for engineering?



Global sustainability: challenge and opportunity for engineering

- Engineers are the great problem solvers of the world
- Understanding the problem
- Climate, environment, resources, ...
- United Nations 17 Sustainable Development Goals
- God created the World and engineers change it!

How it Happened and Why am I here?

Green Deal (19-24) 0,6 Trillion Euro

Sustainability Competence Framework (JRC) – Green Comp (22)

New European Bauhaus (21)

Level(s) (20)

EU-Level Technical Guidance on adapting buildings to climate change

....

Structure

- **Terms of reference for competences of engineers**
- **Upskilling of Engineers (CPD and LLL)**
- **Impact of engineers on Sustainable**

UNESCO II Engineering Report (4Mar21)

- **Engineering for Sustainable Development**
- **4.ENGINEERING EDUCATION AND CAPACITY-BUILDING FOR SUSTAINABLE DEVELOPMENT**
- 4.1 Engineering education for the future;
- 4.2 Lifelong learning in engineering: an imperative to achieve the Sustainable Development Goals;
- 4.3 Engineers' continuing professional development

Engineering Qualification Frameworks

- **Tuning-AHELO framework;**
- **EUCEET framework;**
- **EUR-ACE framework;**
- **International Engineering Alliance (IEA) framework;**
- **ABET framework;**
- **Conceiving, Designing, Implementing, Operating (CDIO) Initiative framework;**
- **National Society of Professional Engineers framework;**
- **American Society of Civil Engineering (ASCE) framework.**

CALOHEE (Tuning)

Comparing Achievement of Learning Outcomes in Higher Education

- **Knowledge and understanding**
- **Analysis and problema solving**
- **Design**
- **Research**
- **Practice**
- **Decision Making**
- **Team working**
- **Communication**
- **Lifelong Learning**

Competences framework

- FEANI - EMC (adapted from [CALOHEE](#))

Dimension	Knowledge	Skills	Attitudes
Level 7 EQF MASTER	Demonstrate knowledge and understanding of the disciplinary, professional, personal and interpersonal requirements necessary to solve / design / investigate / conduct very complex engineering problems / products, processes and systems / issues / activities in Engineering (Civil, Mechanical, Chemical, Informatics,)	Apply knowledge and understanding to solve / design / investigate / conduct very complex engineering problems / products, processes and systems / issues / activities in Engineering (Civil, Mechanical, Chemical, Informatics,)	Identify and justify appropriate and relevant established method or new and innovative methods to solve / design / investigate / conduct very complex engineering problems / products, processes and systems / issues / activities in Engineering (Civil, Mechanical, Chemical, Informatics,) and behave according to professional, ethical and social responsibilities.



Civil engineering-related SDGs

All 91 targets of the 10 civil engineering-related SDGs



44 targets of the 10 CE-related goals are closely linked with interests and professional activities of civil engineers

Targets and indicators of these 10 goals reveal the particular roles that civil engineers have to play in achieving them

They also reveal relevant educational needs

GreenComp

- The European sustainability competence framework (Jan22)
- Knowledge, Skills and Attitudes descriptors
- Embodying sustainability values
- Embracing complexity in sustainability
- Envisioning sustainable futures
- Acting for sustainability

Sustainability Competences of Engineers (Use GreenComp)

- Inclusion on all engineering education/training programs of competences/learning outcomes
- Training for active engineers (mandatory!)
- Continuing Professional Development/Lifelong learning
- Required by professional organizations to keep status
- Medium and long term impact - graduates
- Short term impact - professionals

Thank You for the Attention!