Enhance Engineers to Professionals

and

Understand the Relevance of Accreditation.

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WEC

Dr. Ing. J W Proper, NHTV University Breda, The Netherlands
Chairman FEANI/European Monitoring Committee
Variety of Academic Titles in Europe for Engineers/Resume

Akademiingeniør
Bachelor of Arts
Bachelor of Engineering
Bachelor of Science
Civilingeniør
Civilingenjör
Diplom-Ingenieur
Diplom-Ingenieur ETH
Diplom-Ingenieur (FH)
Diplomi-Insinöör
Diplomirani Inženir
Doktor-Ingenieur
Dottore in Ingegneria

Engenheiro
Europa-Ingenieur
Ingenieur (grad.)
Ingeniør
Inginer
Insinööri
Ingeniero Químico
Ingeniero Superior
Ingeniero Técnico
Ingénieur civil
Ingénieur diplômé
Ingénieur industriel
Ingénieur technicien

Inženyř
Inžinier
Inżynier
Magister Inżynier
Master of Arts
Master of Engineering
Master of Science
Okleveles mérnök
Okleveles üzemmérnök
Sivilingeniør
Teknikfræðingur
Teknikumingeniør
Verkfræðingur

... makes comparison very difficult
Enhance Engineers to Professionals

Engineering degree(s)

- Engineers who are proficient in the more theoretical aspects dealing with research, original concepts and their creation (more theoretically orientated)

- Engineers who have a firm understanding of engineering principles and an ability to apply them (more applications oriented).
Enhance Engineers to Professionals

• Engineering has two main components, engineering knowledge, the “know what”, and engineering process, the “know how”.

• **Engineering Knowledge** - is the growing body of facts, experience and skills in science, engineering and technology disciplines; coupled to an understanding of the fields of application. (academic (projects) and professional (practice) related)

• **Engineering Process** - is the creative process which applies knowledge and experience to seek one or more solutions to meet a requirement, solve a problem, and then exercise informed judgment to implement the one that best meets constraints. (academic (projects) and professional (practice) related)

Both components show differences in the academic and professional environment
Professional Engineers show generic competences

- an ability to serve society through a sound understanding of engineering principles based on a study of mathematics, scientific and technological subjects,
- an ability to apply theoretical and practical methods to the analysis and solution of engineering real life problems,
- a facility for multi-disciplinary working, with managerial and communications skills.
In the European Union, each EU country is alone responsible for defining the Education/Formation/Academic Title as well as to regulate or not the access to the profession:

- Education and access to the profession are not EU domain of responsibility

- The principles of ‘Bologna’ are implemented on their national interpretation

- However, in some EU countries:

→ 1st cycle is not an “Engineer”: not authorized to work as an Engineer.

→ Professional engineer Title given in after assessment of an engineer (long cycle) professional experience (Chartered Engineer)
**Knowledge and/or Competences**

**Competence:**
‘the ability, derived from a base of proven knowledge and practice, to do a particular activity to a prescribed standard’.

Thus it is mainly concerned with what people understand and can do rather than what they know and is a dynamic combination of attributes, abilities and attitudes.

**HOW, WHERE, WHEN and by WHO is this assessed?**
Objectives (derived from Feani Objectives)

- Formal recognition of Academic Degrees in Engineering in Europe
- Acknowledgment in the business community in Europe (and worldwide)
- Free movement within Europe (and worldwide)
- Improve career development
- Network of peers
FEANI Contribution to Mobility, Recognition andAcknowledgement of Professional Qualifications to supportcareer and free movement

**Topic:** INDEX database, EUR ING title, EngineerING Card

**FEANI Committee:** The European Monitoring Committee (EMC)

Experts in European engineering professional system and education:
- Check and approve entry of programmes in the INDEX proposed by the NMC
- Award EUR ING Title
- Monitor the quality of the Professional Card
A. **FEANI INDEX (started in 1980)**

The INDEX is a FEANI proprietary system: The acceptance process is done by FEANI experts.

- Contains today a list of +/- 1,000 HE institutes with +/- 10,000 engineering programmes accredited by FEANI, fulfilling the mandatory requirements for the EUR ING title.

- Minimum requirements for the formation of an engineer:
  - **Basic Sciences**: a minimum of 20% of the overall ECTS
  - **Mathematics**: a minimum of 24 ECTS
  - **Engineering Subjects**: a minimum of 50-60% of the overall ECTS
  - **Non-technical subjects**: a minimum of 10% of the overall ECTS

2011 Topic:

- Development from program input analysis to and/or competence based analysis and/or country analysis.

- EUR-ACE labelled programmes are inserted in the FEANI INDEX.
**EUR-ACE**

Framework Standards: based on *programme outcomes* (academic competences) as:

Knowledge and Understanding

- Engineering Analysis
- Engineering Design
- Investigations
- Engineering Practice
- Transferable (personal) Skills
Requirements

Feani input criteria to analyze programmes of short cycle engineer and long cycle engineer

EUR–ACE®–
accredited Bachelor’s– / Master’s degree programme

Other degrees accreditation

Country equivalence test including EUR–ACE criteria

1 EUR–ACE = European Accredited Engineering
FEANI Contribution to Mobility, Recognition and Acknowledgement of Professional Qualifications to support career and free movement

The FEANI EUR ING title

7 years of Formation: Education U between 3 and 5 years
Training T minimum 2 years
Experience E

The FEANI professional formation framework:

3 U 4 E
3 U 2 T 2 E
3,5 U 0,5 T 3 E
5 U 2 E
As a globally active business we need the best engineers. We therefore support the "engineerING Card".

More Mobility for Engineers in Europe
Requirements To Be Met?

- Degree in engineering from university
  - short cycle engineer
  - long cycle engineer
- EUR-ACE®-accredited Bachelor’s- / Master’s degree programme\(^1\)
- Other degrees
- Individual equivalence test

\(^1\) EUR-ACE = European Accredited Engineering
- Do you accept the concept of Difference in Excellence:
  - Europe academic qualifications and professional qualifications show diversity
  - Europe engineers is not one unified concept
  - Engineering knowledge and engineering know how relate to both academic and professional components
  - Professional Engineers in Europe show some common competences

- Are you understanding the relevance of:
  - European recognition of Academic Degrees in Engineering
  - Acknowledgment in the business community in Europe (and worldwide)
  - Support of free movement for job opportunities within Europe
  - Improvement of international career development
  - Network of peers

- Do you support the relevance of Index

- Do you support the relevance of the EUR ING concept

- Do you support the professional Engineering Card?

Then you enhance Engineers to Professionals and do you recognize the Relevance of Accreditation