The European Dimension of Quality Assurance
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EUR-ACE®: the European approach to Quality Assurance and Accreditation of Engineering Education

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EUR-ACE® European Accreditation of Engineering Programmes

ENAEE European Network for Accreditation of Engineering Education

One of the most important achievements of the “Bologna Process” is the development and implementation of specific Quality Assurance procedures for Higher Education, presently in place in most countries of the European Higher Education Area (EHEA).

Main reference document:

Standards and Guidelines for Quality Assurance in the European Higher Education Area

(usually referred to as ESG)

prepared by ENQA, the European Network (*now* Association) for Quality Assurance in Higher Education. and officially adopted by the Bergen HE Ministers’ Conference (2005).

The implementation of QA practices throughout the EHEA has been strongly encouraged, and in almost every country a QA Agency has by now been established; in 2010 the "European Register of Quality Assurance Agencies" (EQAR) has also been created: 24 Agencies are now listed.
Most of these are "general QA Agencies", i.e. deal with all disciplines (and some even with all levels of education, from primary to tertiary).

A notable exception is the French CTI (Commission des Titres d' Ingénieur)

The ESG have completely replaced the ISO Standards in the QA of HE programmes (although these are still occasionally used, especially in the evaluation of HE managerial structures).

From ESG:

The standards and guidelines proposed in this report envisage an important role for external quality assurance.

The form of this varies from system to system and can include

- institutional evaluations of different types;
- subject or programme evaluations;
- accreditation at subject, programme and institutional levels;
- and combinations of these.

The application of ESG has lead also to reconsider the role and practice of "**accreditation**", nowadays a much used word that however has several similar but not identical meanings, and therefore needs to be appropriately defined.

Main distinction in QA: "institutional" vs. "programme" approach as summarized in the two following slides (2010).

Institutional vs. Programme oriented approaches to QA*

Institutional Approach

- assesses the internal monitoring and quality assurance arrangements
- Content of programmes are not thoroughly examined
- allows for more flexibility in terms of structure, content and implementation of study programmes
- emphasises the autonomy and the primary responsibility of the institutions for their quality

Programme Approach

- transversal comparison between subjects possible
- better information about programmes offered, recognition of joint degrees
- more resources needed (time and money), extra bureaucracy
- limited effect in improving the institution's management of teaching and learning quality

*ENQA workshop report *Programme-oriented and institutional-oriented approaches to quality assurance: new developments and mixed approaches*

The question of programme accreditation

- Main political imperative: robustness of European QA
- No discontinuity between institutional and programmes levels, where both are consistent with ESG
- Particularly relevant for disciplines relevant to public health and safety
- Cooperation between, and overlapping membership of, interested agencies
- The particular relevance of EUR-ACE criterion 2.3…

Definition adopted by ENAEE & EUR-ACE:

Accreditation of an [Engineering] Education Programme

is the result of a process to ensure **suitability of** p**rogramme as entry route to the** [***engineering***] **profession,** by means of

- Periodic assessment against accepted standards
- Peer review of written and oral information by trained and independent panels including academics and professionals

The "quality" and "relevance" of accredited degrees
Is guaranteed at all "levels",
but accreditation refers to education only, not whole formation

EUR-ACE® European Accreditation of Engineering Programmes

EUR-ACE is "**programme** accreditation"; to qualify it better, it can be called "**pre-professional accreditation**"

From ENAEE's Mission (General Policy Statement. 2009)

- ENAEE strongly supports a field-specific approach and programme accreditation, considering it essential to fulfil the need of aligning the goals of educational programmes with the expectations of the relevant stakeholders and ensuring their relevance for the labour market.
- Programme accreditation does not exclude institutional accreditation: on the contrary, it may become easier if an overall system of QA authorizes only quality HEIs to deliver academic degrees.

The EUR-ACE accreditation system was envisaged by the EU-supported EUR-ACE project (2004-06) to make up for the lack of a European accreditation system of engineering education accepted on the continental scale.

To implement the EUR-ACE system, the European Network for Accreditation of Engineering Education (ENAEE)
www.enaee.eu
was founded in February 2006 by 14 concerned Associations.

Two main outcomes of the EUR-ACE project:

a) a synthesis of existing national Standards:

EUR-ACE Framework Standards for the Accreditation of Engineering Programmes

b) a proposal for the Organization and Management of the **EUR-ACE Accreditation System**

The EUR-ACE Standards and all other relevant documents are available on the site of ENAEE www.enaee.eu or www.eur-ace.eu

EUR-ACE® Framework Standards for the Accreditation of Engineering Programmes

The EUR-ACE Framework Standards, that were compiled as a "synthesis" between existing national Standards, specify the **Programme Outcomes** to be satisfied. They:

- Are valid for all branches of engineering and all profiles
- Distinguish between **First** and **Second Cycle** programmes, as defined in the European Qualification Frameworks
- Are applicable also to "**integrated programmes**", i.e. programmes that lead directly to a Second Cycle degree
- **Describe the abilities that the graduates must achieve but not how they should be taught**
- Can accommodate national differences of educational and accreditation practice

The EUR-ACE® Standards distinguish between First cycle (FC) and Second Cycle (SC) degrees, and identify 21 programme outcomes for First Cycle degrees and 23 for Second Cycle degrees, grouped under six headings, namely:

- Knowledge and Understanding
- Engineering Analysis
- Engineering Design
- Investigations
- Engineering Practice
- Transferable Skills

For each heading the Outcomes of **First Cycle** and **Second Cycle** degrees are specified.

The EUR-ACE® Framework Standards require that the assessment of a programme considers not only the Programme Outcomes, but all following items:

- 1. Needs, Objectives and Outcomes;
- 2. Educational Process;
- 3. Resources and Partnerships;
- 4. Assessment of the Educational Process;
- 5. Management System

and for each item specify the criteria to be assessed.

EUR-ACE® European Accreditation of Engineering Programmes

Full text of EUR-ACE® Framework Standards on www.enaee.eu & www.eur-ace.eu

EUR-ACE® accreditation system: how does it work?

- **National (or Regional) Agencies accredit** EE programmes;
- If the Agency satisfies appropriate Quality requirements, **and** the accredited programmes satisfy the **EUR-ACE Framework Standards**, it is authorized to add the **"EUR-ACE® quality label"** to the national accreditation, thus giving it an international value, without any further procedure.
- The EUR-ACE® label distinguishes between **FIRST CYCLE and SECOND CYCLE DEGREES**, in accord with the EQFs.
- "Integrated (long) Programmes" can be awarded the **SC** label

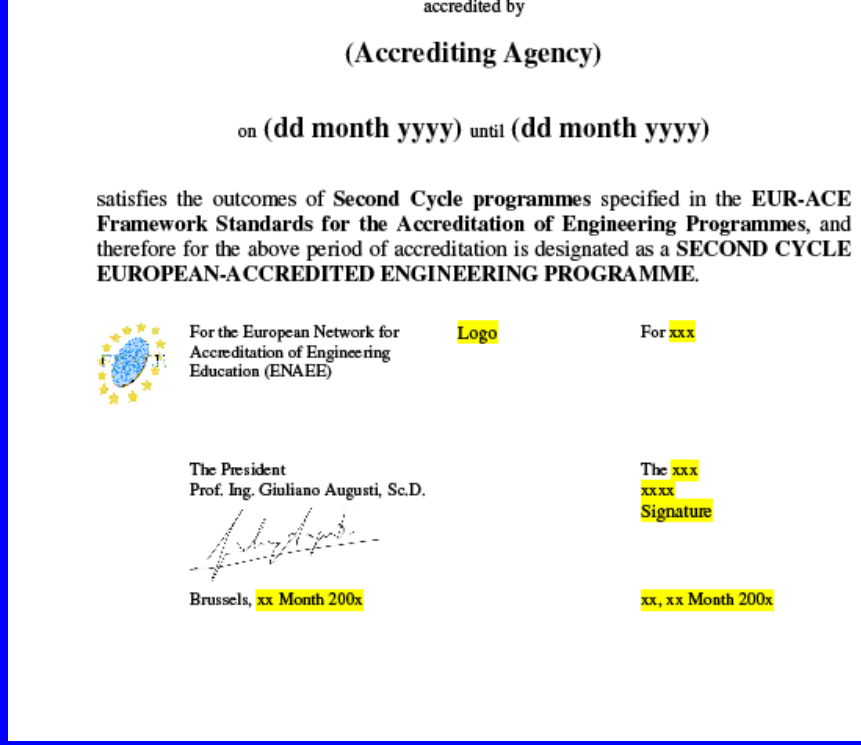
EUR-ACE® European Accreditation of Engineering Programmes

The last points characterize the EUR-ACE system in accord with the "Bologna" approach, and allows to define it "European Accreditation …"

Sample EUR-ACE® Label Certificate:

the relevant programme is designated as a **FIRST [**or **SECOND] CYCLE EUROPEAN-ACCREDITED ENGINEERING programme;**

the respective graduates can call themselves either **EUR-ACE® Bachelor** or **EUR-ACE® Master**



EUR ACE®
European Accreditation of Engineering Programmes

This is to certify that the xxx programme

Official name of the education programme in original language (and in English)

provided by

Name of Educational Institution, and Faculty or Department, (if applicable)

accredited by

(Accrediting Agency)

on **(dd month yyyy)** until **(dd month yyyy)**

satisfies the outcomes of **Second Cycle programmes** specified in the **EUR-ACE Framework Standards for the Accreditation of Engineering Programmes**, and therefore for the above period of accreditation is designated as a **SECOND CYCLE EUROPEAN-ACCREDITED ENGINEERING PROGRAMME.**

For the European Network for Accreditation of Engineering Education (ENAEE)

Logo

For xxx

The President
Prof. Ing. Giuliano Augusti, Sc.D.

The xxx
xxxx
Signature

Brussels, xx Month 200x

xx, xx Month 200x

Six Agencies [the relevant partners of the EUR-ACE project (2004/06)], were authorized to deliver the EUR.ACE Label (EUR-ACE-authorized) in November 2006

- **ASIIN** (Accreditation Agency for Study Programs in Engineering, Informatics, Natural Sciences and Mathematics), Germany
- **CTI** (Commission des Titres d' Ingénieur), France
- **Engineers Ireland**
- **RAEE** (Russian Association for Engineering Education)
- **Engineering Council**, United Kingdom
- **Ordem dos Engenheiros**, Portugal

A seventh Agency was authorized in January 2009:

- **MÜDEK** (Association for Evaluation and Accreditation of Engineering Programs), Turkey

Awarded labels as of December 2010

Agency	Date accr/n	Countries oper.	FCD	SCD	Total
ASIIN	Nov.2006	**DE, CH**	**134**	**111**	**245**
CTI	”	**FR, BE, BG, ES**	**--**	**229**	**229**
Eng.Ireland	”	**IE**	**70**	**24**	**94**
RAEE	”	**RU, KZ**	**9**	**39**	**48**
EngC	”	**UK**	**?**	**?**	**36**
Ord.Eng	”	**PT**	**0**	**4**	**4**
MÜDEK	Jan.2009	**TR**	**78**	**--**	**78**
		Overall total:			**734**

As of February 2011, a number of applications from other Agencies that want to be EUR-ACE-authorized have been received and are being considered:

- **NVAO (**Accreditation Organisation of Netherlands and Flanders)
- **ARACIS,** QA Agency, Romania
- **SKVC,** QA Agency, Lithuania
- **OAQ,** QA Agency, Switzerland
- **KAUT,** Accreditation Committee for Technical HE Institutions, Poland

Moreover:

- **Agenzia EUR-ACE**, Italy will apply soon;
- **CTI** (jointly with **AEQES**, the French-Belgian HE Accreditation Agency) will accredit and award the EUR-ACE label to engineering programmes in French-language Belgian HEIs;
- **Kazakhstan,** the latest (47th) EHEA country, participates through **RAEE,** but is also trying to create a national Engineering Accreditation Agency.

The **EUR-ACE® label** is quoted in an official European Commission Report (September 2009) as an **example of good practice** in QA:

COMMISSION OF THE EUROPEAN COMMUNITIES

Brussels, 21.9.2009
COM(2009) 487 final

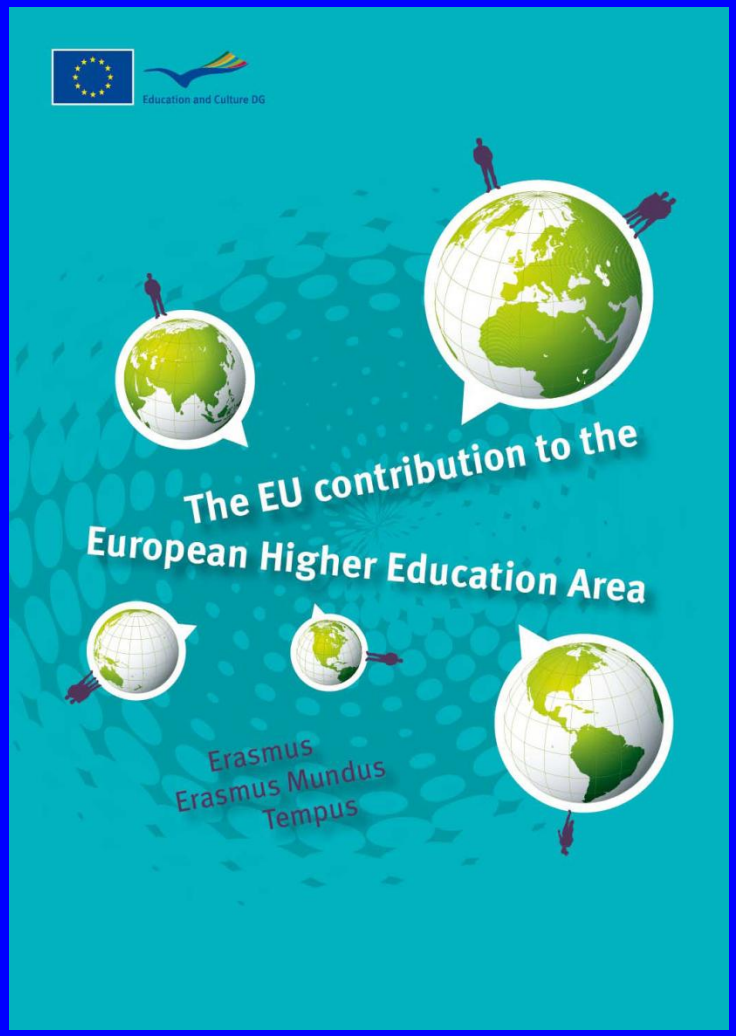
REPORT FROM THE COMMISSION TO THE COUNCIL, THE EUROPEAN PARLIAMENT, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS

Report on progress in quality assurance in higher education

Good practice

The EUR-ACE label in engineering exists at the bachelor and master level. Standards were defined at European level, but are applied through national quality assurance agencies that are authorised to issue EUR-ACE "labels" together with their national accreditation. Several hundred labels have already been awarded, but they are still available from only seven national agencies[23].

The EUR-ACE® label is quoted also in a EU publication issued for the “Bologna Anniversary Conference”, March 2010:



page 8:

The Commission is supporting the development of a series of subject-specific **European quality labels**, which could/may lend their standards to existing agencies or become agencies in their own right. Examples include the **EUR-ACE label in engineering** and the Eurobachelor, Euromaster and Eurodoctorate labels in chemistry.

Thus, although the EUR-ACE label has **no "legal" or "official" value**, its significance and weight are rapidly increasing.

FEANI (European Federation of National Engineers' Associations) includes automatically the EUR-ACE-accredited programmes in its INDEX of recognized engineering programmes.

The EUR-ACE label is recognized as the basic academic qualification in the **engineerING card** (a European Professional Card). formally launched by FEANI at its General Assembly on 2 October 2010 and already in force in a few countries.

Which Requirements Must Be Met?

Degree in engineering from university

short cycle engineer

long cycle engineer

EUR-ACE®-accredited Bachelor's- / Master's degree programme[1]

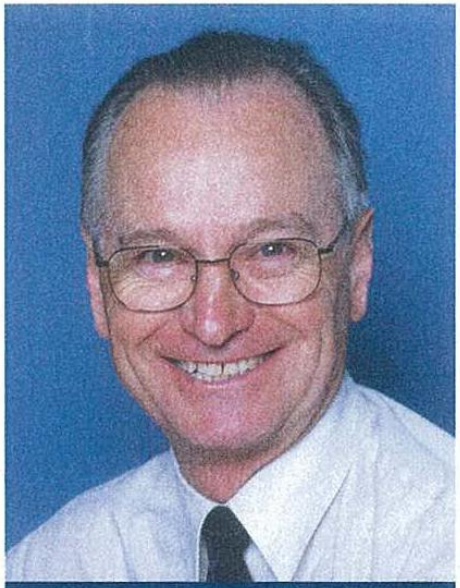
Other degrees

Individual equivalence test

[1] EUR-ACE = European Accredited Engineering

EUR-ACE has gained attention even down under: e.g. see an article in the “Engineers Australia” magazine, October 2010:

WORLD VIEW



Peter Greenwood

Australian representative on the World Federation of Engineering Organisations' General Assembly and a member of its Executive Council.

Accreditation reaches milestone in Europe

Several European countries have adopted a new internationally recognised accreditation system for engineering education. They are now supporting a new European Accredited Engineer (EUR-ACE) degree certificate.

EUR-ACE accreditation is based on national accreditation agencies' programs that meet legal national standards first and then EUR-ACE Framework Standards (EAFS). As of June 2010 nearly 600 programs were accredited by agencies in seven countries. The EUR-ACE label can be awarded in addition to any national certificate or label.

The EUR-ACE project is sponsored and coordinated by the European Network

should have and some thought was given to what industry needed from engineers.

In the EHEA, 3 + 2 is defined in terms of two and now three cycles. At the end of each cycle the graduate emerges with either a bachelors (3 years), masters (2 years) or doctoral (3 years) award respectively.

The Bologna Process participants have a strategy to take the process worldwide. The strategy is intended to facilitate mobility through the fair recognition of qualifications, strengthen cooperation based on partnerships, promote the attractiveness and competitiveness of European higher education and improve communication.

ENAEE intends to follow a similar

Thank you for your attention….

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For up-to-date information, application forms, etc., visit

www.enaee.eu or www.eur-ace.eu