

ENAAEE and EUR-ACE®

A network and a system

to ensure quality
and accredit

engineering programmes

in a pan-European context:

the EUR-ACE® label

Giuliano Augusti

Coordinator, EUR-ACE-IMPLEMENTATION project

President ENAAEE



It is well known that Europe is a Continent of many cultures.

Different historical backgrounds have led to very different systems of Higher Education:

the “Bologna Process” aims at their compatibility and transparency [not at their uniformity], in order to facilitate trans-national recognition and mobility

and the same time guarantee “quality” of education.

In this context, **accreditation** of engineering educational programmes as entry route to the **engineering profession** has been proved to be a powerful tool to improve at the same time academic quality and relevance for the job market.

However, **significance and procedures for accreditation of Engineering Education vary greatly from one European country to the other.**

This creates difficulties in trans-national recognition and mobility.

European Directives for transnational recognition of professional qualifications are in force since the late '90s.

In September 2005, after years of discussions, the new

DIRECTIVE 2005/36/EC
OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL
ON THE RECOGNITION OF PROFESSIONAL QUALIFICATIONS

was published, and is now being implemented in the EU countries.

But these Directives regard **Professional**, not **Academic** qualifications....:

Indeed, **education** is outside the realm of the European Treaties (including the Maastricht Treaty of 1992) and can only be “influenced” not “regulated” by EU:

answers can and should come from **bottom-up** initiatives!

At present **Europe lacks an accreditation system of engineering education accepted on the continental scale.**

This fact, notwithstanding the prestige of many National systems and of some Academic titles, in a global job market puts the European engineer in a objectively weak position, when confronted with the several international recognition agreements, existing or on the making.

This was the basic motivation behind the

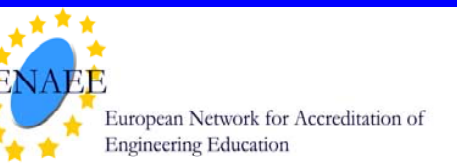
EUR-ACE project

(EURopean ACcredited Engineer)

and the establishment of

ENAAE

European Network for Accreditation of EE



Accreditation of an Engineering Education Programme

(according to EUR-ACE and ENAEE)

- Result of a process to ensure suitability of programme as entry route to the [*engineering*] profession
- Periodic assessment against accepted standards
- Peer review of written and oral information by trained and independent panels including academics and professionals
- **Accreditation of programme, not of Department or University**
- Accreditation of education, not of whole formation



Quality of accredited degrees
guaranteed at all “levels”

The **EUR-ACE** project (2004/2006) has proposed an **European accreditation system** that will

- ensure consistency between existing national “engineering” accreditation systems;
- add an European “quality label” to accreditation;
- introduce “accreditation” in other countries;

and thus

improve quality of education

facilitate trans-national recognition

facilitate (physical and virtual) mobility



EUR-ACE has been supported by the European Commission (DG EaC) within SOCRATES and TEMPUS programmes

Main EUR-ACE output document: A1) EUR-ACE Framework Standards for the Accreditation of Engineering Programmes

These “Framework Standards”, that were compiled as a “synthesis” between existing national Standards, specify the **Programme Outcomes** that must 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 Framework
- Are applicable also to “**integrated programmes**”, i.e. programmes that lead directly to a Second Cycle degree
- Describe what is to be achieved but not how
- Can accommodate national differences of educational and accreditation practice

Six categories of Programme Outcomes

- Knowledge and Understanding
- Engineering Analysis
- Engineering Design
- Investigations
- Engineering Practice
- Transferable (personal) Skills

For each category, the EUR-ACE Framework Standards list the Programme Outcomes of **First Cycle** and **Second Cycle**





EUR-ACE Standards: *an example*

Knowledge and Understanding

First cycle

- Knowledge and understanding of the scientific and mathematical principles underlying their branch of engineering.
- A systematic understanding of the **key aspects and concepts** of their branch of engineering.
- Coherent knowledge of their branch of engineering including some at the forefront of the branch.
- Awareness of the wider multidisciplinary context of engineering.

Second cycle

- An **in-depth** knowledge and understanding of the principles of their branch of engineering;
- A **critical** awareness of the **forefront** of their branch.



The EUR-ACE project

elaborated also another document

A2) Organization and Management of the EUR-ACE Accreditation System: a proposal

The accreditation system envisaged by this proposal, and now being implemented, is a true novelty on the global scale.

As a first step for implementation of the proposal, *the former “European Standing Observatory for Engineering Profession and Education” (ESOEPE) has been transformed into a registered international not-for-profit Association:*

the **European Network for Accreditation of Engineering Education ENAEE**



The EUR-ACE accreditation system is being set up **within** ENAEE, monitored by an ad-hoc Working Group (**EUR-ACE Label Committee**)

European Network for Accreditation of Engineering Education



Official birth date: 8 February 2006

European Network for Accreditation of
Engineering Education

Founding members:

FEANI (*acting Secretariat*) **RAEE** (RU)

SEFI **CoPI** (IT)

UNIFI/TREE **IEI-EngineersIreland**

EUROCADRES **OE** (Ordem...) (PT)

EC (UK) **UAICR** (RO)

CTI (FR) **IDA** (DK)

ASIIN (DE) **FOTEP/BBT** (CH)



First General Assembly: 30 March 2006
Second “ “ : 17 November 2006
Third “ “ : 14 November 2007

European Network for Accreditation of
Engineering Education

New members

admitted at the Second General Assembly
(17 November 2006)

CLAIU

MÜDEK (TR)



Official birth date: 8 February 2006

First General Assembly: 30 March 2006

European Network for Accreditation of
Engineering Education

Administrative Council (2006/09)

G. Augusti (IT, President),
A. Chuchalin (RU),
C. Forslund (SE),
A. Pugh (UK),
J. M. Siwak (FR),
I. Wasser (DE),
P. Wauters (BE, Treasurer)



European Network for Accreditation of
Engineering Education

At present (2007), ENAE is implementing the EUR-ACE system, also thanks to two EU projects:

Under the “Socrates” programme:

EUR-ACE IMPLEMENTATION (in the EU) (2006/08)

Under the “Tempus-Tacis” programme:

PRO-EAST: PROmotion and implementation of the EUR-ACE Standards (in Russia) (2006/07)

ENAE is involved also in a project under the “Tempus-Meda” programme:

LEPAC: Creation of a Lebanese Engineering Programs

Accreditation Commission (2006/08)

EUR-ACE IMPLEMENTATION

A project aimed at implementing the EUR-ACE system in the EU

(1 September 2006 / 31 July 2008)

Contracting Institution: UNIFI (C.Borri, Legal Representative)
(G.Augusti, Coordinator)

Partner Institutions (17+2):

ENAAEE	IDA (DK)	UAICR (RO)
FEANI	C.T.I.(FR)	RAEE (RU)
SEFI	IEI EngineersIreland	OE (PT)
EUROCADRES	CoPI (IT)	MÜDEK (TR)
EUA	CRUI (IT)	ASIIN (DE)
AUA (USAEE)	NVAO (NL)	EC (UK)
OPET/BBT(CH)		

In parallel to EUR-ACE IMPLEMENTATION,
a project under the TEMPUS-TACIS programme:

PROMotion and implementation of the EUR-ACE Standards [PRO-EAST]

(October 2006 - November 2007)

- Participating Institutions:
UNIFI, RAEE, FEANI, CoPI, SEFI, TPU
- Project coordinator: **Oleg Boev**
- Deputy coordinator for EU: **Giuliano Augusti**
- External experts: Iring Wasser, Ian Freeston.

Main aims:

- dissemination of the EUR-ACE results
- Award of the first EUR-ACE labels in Russia

Another relevant project within the TEMPUS-MEDA programme (January 2007 / April 2008):

LEPAC: Creation of a Lebanese Engineering Programs Accreditation Commission

Contracting Inst.: **FEANI** (Philippe Wauters: Legal Repr.)

Project coordinator: **Haissam Ziade**

Grant Coordinator: **Giuliano Augusti**

Participating Inst. from EU: **ASIIN, CTI, UNIFI, TUAachen**

Participating Institutions from Lebanon:

- **Ministry of Education, Directorate for HE**
- **Orders of Architects and Engineers, Beirut & Tripoli**
- **4 Lebanese Universities**

ENAAEE and the three projects
work in close collaboration



From the ENAAEE General Policy Statement
(General Assembly, 17 Nov. 2006)

[1]

ENAAEE will actively contribute to running the EUR-ACE IMPLEMENTATION and PRO-EAST projects, in full coherence with the objectives indicated in the Final Documents of the EUR-ACE project, to which ENAAEE is fully committed.

Therefore, in accord with the quoted EUR-ACE objectives, ENAAEE will try and establish gradually a bottom-up European system for accreditation of engineering education, as wide as possible and consistent with the general indication of the Bologna process, and in particular with the ENQA “Standards and Guidelines for Quality Assurance in the EHEA” and the “Framework for Qualifications in the EHEA”.



From the ENAAEE General Policy Statement
(General Assembly, 17 Nov. 2006)

[2]

In the EUR-ACE system, national or regional agencies will accredit the educational programmes, and ENAAEE, on the advice of an appropriate Committee, will authorize them to add the EUR-ACE quality label to the accreditation.

The EUR-ACE label will be distinguished into “EUR-ACE Bachelor” (“European Accredited Engineering Bachelor”) and “EUR-ACE Master” (“European Accredited Engineering Master”) respectively when the programme is accredited at the FC or SC level.

ENAAEE will monitor and respond to the development of all future degree programmes that may come within its scope. 21

Recall **KEY POINTS:**

- **NOT** an European Directive
- **NOT** an European Accreditation Board
- A bottom-up agreement towards a decentralized accreditation system in which:
- **Accreditation is awarded by (present and future) National (or Regional) Agencies** that satisfy the EUR-ACE Standards.
- **The EUR-ACE label is “added” to the “national” accreditation, thus giving it an international value**
- The label is different for **FIRST CYCLE (BACHELOR)** and **SECOND CYCLE (MASTER)** in accord with the EQF.

ENAAE evaluated that six agencies fulfill already the EUR-ACE Standards:

ASIIN (DE)
EC (UK)
IEI-EngineersIreland
CTI (FR)
OE (PT)
RAEE (RU)

These Agencies will be the initial “core” of the EUR-ACE system; their representatives sit in the

EUR-ACE Label Committee



Higher Educations Institutions can apply to one of these Agencies to get the EUR-ACE Label in addition to the national accreditation.



Thus, the initial core of the EUR-

ACE system will include six countries

(France, Germany, Ireland, Portugal, Russia, UK) with very different educational and professional systems,

such to constitute a very significant sample of the EHEA countries, both within and outside the EU.

Contacts are under way to include at an early stage in the EUR-ACE system also Turkey and the Netherlands and Flanders.



Three main ways to enlarge the EUR-ACE system beyond the initial core:

- a) *In countries with an Engineering Accreditation Agency, check that it satisfies the quality requirements and agrees to apply the EUR-ACE Standards; then admit it into the system.*
- b) *In countries without any accreditation system: Create a new Engineering Accreditation Agency. In the meantime, programmes can be accredited by an Agency already operative in the system.*
- c) *In countries with established “general” accreditation agencies, these can be authorized to award the EUR-ACE label if they apply the EUR-ACE Standards when accrediting engineering programmes.*

There are still difficulties, especially in the comparative distinction between FCD (Bachelor) and SCD (Master) programmes.

The EQF and the Professional Directive 2005/36 are not always 100% clear in this respect.

But I am optimistic: overcoming these difficulties will be also a fundamental test for the validity and applicability of the EQF.



Summing up,
ENAAEE aims at creating a two-tier system of accredited engineering programmes:
additional qualifications (e.g. for very specialized degrees) are not excluded.

This approach and the essential distinction into “Bachelor” and “Master” should make the EUR-ACE system at the same time flexible and simple.

Third Cycle (Doctoral) degrees are not (yet) considered.

The EUR-ACE system will call

EUROPEAN ACCREDITED ENGINEERING BACHELOR

the graduate of a **FIRST-CYCLE ENGINEERING DEGREE PROGRAMME** provided by any HEI

and

EUROPEAN ACCREDITED ENGINEERING MASTER

the graduate of a **SECOND-CYCLE ENGINEERING DEGREE PROGRAMME** provided by any HEI

leaving the term “engineer” to the professional regulations

The first EUR-ACE label certificates are being awarded



**EUROPEAN ACCREDITED ENGINEERING BACHELOR
(FIRST-CYCLE DEGREE PROGRAMME)**



**EUROPEAN ACCREDITED ENGINEERING MASTER
(SECOND-CYCLE DEGREE PROGRAMME)**



*Up-to-date information on the
EUR-ACE system,
and related events & initiatives,
can be found on*

www.enaee.eu

For a complete up-to-date review up to June 2007 see the paper:

G. Augusti: Accreditation of Engineering programmes: European perspectives and challenges in a global context

European Journal of Engineering Education, 32:3 (2007), 273 – 283

also on www.enae.eu





Giuliano Augusti

President of ENAE

Coordinator of EUR-ACE IMPLEMENTATION

giuliano.augusti@uniroma1.it

Tel. (+39)06.4458.5155;
mobile: (+39)320.4271831

www.enaee.eu

The other existing “global” [W-S-D] system appears much more complicated:

Different “accords”:

- Washington Accord
- Sydney Accord
- Dublin Accord

Different “registers”:

- EMF International Register of Professional Engineers
- ETMF International Register of Engineering Technologists
- APEC Register of Professional Engineers

Moreover, the W-S-D system includes a fundamental differentiation/barrier between “Professional Engineers” and “Engineering Technologist” (which is not in the spirit of the EQF nor of EU Directive 2005/36... and in many languages is not understandable...), but defines all recognized (accredited) “Engineers’ ” degrees as “Bachelor”.