

# Enhancing consistency and quality of accreditation procedures and the quality management of ENAEE authorised agencies

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ENAEE MEMBERS FORUM



# OUTLINE

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- Why consistency?
- Consistency in understanding and interpretation of EAFSG
- Consistency in the evaluation/accreditation procedures of different authorized agencies within the EUR-ACE<sup>®</sup> system.
- Training of accreditation panel members
- Consistency in evaluation procedures and accreditation decisions of different review teams within the same agency.
- Assessment & continuous improvement

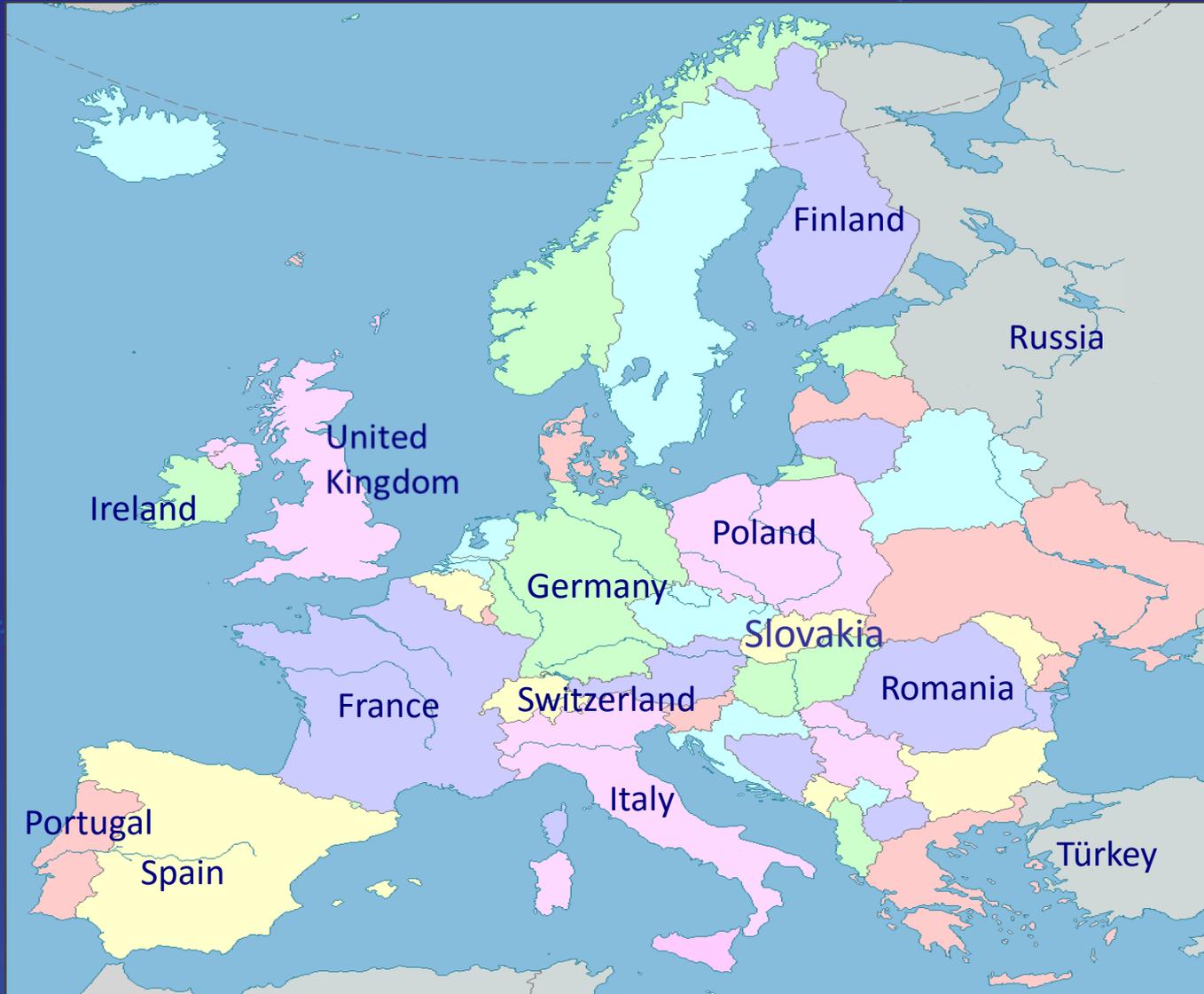
# Why Consistency ?

Progress in number of agencies awarding **EUR-ACE<sup>®</sup>** Label

2007	2009	2012	2013	2015	2017	
AEER	AEER	AEER	AEER	AEER	AEER	Russ. Fed
ASIIN	ASIIN	ASIIN	ASIIN	ASIIN	ASIIN	Germany
CTI	CTI	CTI	CTI	CTI	CTI	France
EI	EI	EI	EI	EI	EI	Ireland
EngC	EngC	EngC	EngC	EngC	EngC	UK
	MUDEK	MUDEK	MUDEK	MUDEK	MUDEK	Turkey
	OE	OE	OE	OE	OE	Portugal
		ARACIS	ARACIS	ARACIS	ARACIS	Romania
		QUACING	QUACING	QUACING	QUACING	Italy
			KAUT	KAUT	KAUT	Poland
				ANECA	AMECA	Spain
				AAQ	AAQ	Switzerland
				FINEC	FIMEEC	Finland
					ZSVTS	Slovakia



# Countries with agencies authorized to award **EUR-ACE**® Label



# Global Acceptance of **EUR-ACE**® Label



European  
Accreditation  
of Engineering  
Programmes  
**EUR-ACE**®



**ENAE**

Country	# EUR-ACE
Australia	36
Azerbaijan	5
Belgium	108
Bulgaria	5
China	8
Croatia	5
Cyprus	11
France	458
Finland	14
Germany	704
Indonesia	4
Ireland	157

Country	# EUR-ACE
Italy	39
Kazakhstan	117
Kyrgyzstan	2
Lebanon	1
Mexico	6
Mongolia	3
Peru	9
Poland	47
Portugal	55
Romania	1
Russ. Fed.	359

Country	# EUR-ACE
Serbia	2
Slovenia	18
Spain	87
Switzerland	25
Tajikistan	2
Tunisia	3
Turkey	286
Ukraine	1
UK	218
Uzbekistan	1
Vietnam	18

2815 Labels in 34 countries

**European Label Global Quality**

# Why Consistency ?

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## EUR-ACE® Accord

“Mutual recognition of **EUR-ACE®** labelled programmes among authorized agencies means that an agency (the host agency) in one country recognizes that EUR-ACE labelled degree programmes from ENAE authorized agencies in other countries meets the **EUR-ACE® Framework Standards** requirements at the relevant bachelor or master level.”

Nov. 19, 2014

# Why Consistency ?

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## ENAE – IEA

## Best practice in accreditation of engineering programmes

- “This exemplar captures a common understanding of best practice in engineering accreditation. It serves both ENAE and IEA in their ongoing operations.”
- “The accreditation process requires the programme provider to account for the resulting quality of curriculum and its execution, for **attainment of the programmes outcomes**/graduate attributes expected from the students and **continuous improvement of the programme...**”

April 13, 2015

# Consistency Need

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Considering the increasing number of EUR-ACE labels awarded by different agencies,  
and the increase of number of agencies which are authorized to award EUR-ACE label

&

mutual recognition agreement of EUR-ACE labelled engineering degree programmes

**consistency became an extremely important issue**

# Consistency Levels

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- Consistency in understanding and interpretation of EAFSG by agencies authorized to award EUR-ACE® label.
- Consistency in the evaluation/accreditation procedures of different authorized agencies within the EUR-ACE® system.
- Consistency in evaluation procedures and accreditation decisions of different review teams within the same agency.

# EUR-ACE<sup>®</sup> FRAMEWORK STANDARDS AND GUIDELINES (EAFSG)



“The student workload requirements and the **Programme Outcomes** are compliant with the overarching Framework of Qualifications for the European Higher Education Area (**EQF**), adopted by the Bergen Conference of European Ministers responsible for Higher Education on 19–20 May 2005.”

# Learning outcomes for EQF level 6 (first cycle)



Knowledge	Skills	Competence
<p>Advanced knowledge of a field of work or study, involving a <b>critical understanding</b> of theories and principles</p>	<p>Advanced skills, demonstrating mastery and <b>innovation</b>, required to solve <b>complex</b> and unpredictable <b>problems</b> in a specialised field of work or study</p>	<p>Manage <b>complex</b> technical or professional activities or projects, taking responsibility for <b>decision-making</b> in unpredictable work or study contexts; take responsibility for managing professional development of individuals and groups</p>

# Learning outcomes for EQF level 7 (second cycle)



Knowledge	Skills	Competence
<p>Highly specialised knowledge, some of which is at the <b>forefront</b> of knowledge in a field of work or study, as the basis for original thinking and/or research.</p> <p><b>Critical</b> awareness of knowledge issues in a field and at the interface between different fields</p>	<p>Specialised problem-solving skills required in <b>research and/or innovation</b> in order to develop new knowledge and procedures and to integrate knowledge from different fields</p>	<p>Manage and transform work or study contexts that are <b>complex, unpredictable</b> and require new strategic approaches; take responsibility for contributing to professional knowledge and practice and/or for reviewing the strategic <b>performance of teams</b></p>

# Major Responsibility of Engineers of 21<sup>st</sup> Century

*Facing today's global challenges  
to find innovative solutions  
&  
to shape a sustainable future*

What are the skills, competencies and experiences that today's engineering students should develop during their education, in order to work effectively and to create new opportunities from global challenges?

To face these challenges  
**INNOVATION**

oriented creative engineers are needed

Curriculum and teaching strategies should be  
designed for  
more creative and innovative engineers

Evaluation and accreditation of programs should  
aim continuous improvement and encourage  
**outcome based curriculum** development  
for the education of more innovative engineers,  
who are aware of global challenges.

# RESOURCES

Teaching staff  
Facilities  
Support staff  
Financial resources  
Student support services



# INTERNAL QUALITY ASSURANCE

Continuous improvement

# STUDENTS

Admission  
Transfer  
Progression  
Graduation



# PROGRAMME OUTCOMES



# PROGRAMME AIMS

Educational needs of the labour market and other stakeholders

# TEACHING & LEARNING PROCESS

Curriculum

# Consistency in understanding and interpretation of EAFSG

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Significant variability in relation to certain programme characteristics such as duration  
&  
more applied versus more theoretical programmes  
has the potential to cause problems for achievement of  
EUR-ACE® programme outcomes

Do all agencies have the same interpretation of  
some of the concepts stated in  
EUR-ACE® programme outcomes?

# Complexity (EAFSG)

- Engineering Analysis: (Bachelor; **Master**)
  - ability to analyse *complex* engineering products, processes and systems...
  - ability to identify, formulate and solve *complex problems* in new and emerging areas of their specialization...
  - ability to identify, formulate and solve unfamiliar *complex engineering problems* that are incompletely defined, have competing specifications...

# Complexity

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## ➤ Engineering Design: (Bachelor; **Master**)

-ability to develop and design complex products (devices, artefacts, etc.), processes and systems to meet established requirements ...

- **ability to develop and design complex products (devices, artefacts, etc.), processes and systems with specifications incompletely defined ...**

## ➤ Investigations

-... investigations and research of complex technical issues.

# Complexity

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## ➤ Engineering Practice: (Bachelor & Master)

- practical skills for solving complex problems, realizing complex engineering designs and conducting investigations in their field of study...
- practical skills including the use of computer tools for solving complex problems, realizing complex engineering designs and conducting complex investigations in their field of study...

## ➤ Making Judgements:

- ability to gather and interpret relevant data and handle complexity within their field of study...
- ability to manage complex technical or professional activities
- ability to integrate knowledge and handle complexity...

# Definition of Complexity

## Complexity: (EAFSG)

“The property of being complex; that is having a number of interconnected parts. Use engineering judgement to work with complexity means that the issue under consideration is not straightforward or amenable to analysis or calculation using standard methods, but requires judgement to balance possibly conflicting requirements.”

# Forefront

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## ➤ Knowledge and Understanding: (Bachelor; Master)

- knowledge and understanding of engineering disciplines  
.....including some awareness at their *forefront*.
- ***critical awareness of the forefront of their specialization.***

## ➤ Engineering Design:

- ability to design using some awareness of the *forefront* of their engineering specialization.
- ***ability to design using knowledge and understanding at the forefront of their engineering specialization.***

## ➤ Investigations:

- ***ability to investigate the application of new and emerging technologies at the forefront of their engineering specialization.***

## Definition of “forefront”:

“Forefront of a branch of engineering or a specialization is the knowledge of recent developments in practice and research. In a field of study that combines knowledge from different branches, the forefront is interpreted as that of the combination and not of the individual branches.”

## Definiton of “critical”:

“Used to describe a factor, component, process, issue or decision in an engineering activity requiring analysis and judgement from which other consequences follow; an entity or operation that must be successfully implemented or completed to ensure that a more complex operation or system can function: failure of the critical entity or operation compromises the whole.”

# Leadership & Team Work

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## ➤ Communication and Team Working

- ability to function effectively in a national and international context, as an individual and as a member of a team...
- ability to function effectively in a national and international context, as an individual and as a member or leader of a team that may be composed of different disciplines and levels...

# Realistic Constraints

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## ➤ Engineering Analysis:

- ability to identify, formulate and solve engineering problems  
...to recognize the importance of non-technical *societal, health and safety, environmental, economic and industrial* constraints...

## ➤ Engineering Design:

- ability to develop and design ...that can include an awareness of non-technical – *societal, health and safety, environmental, economic and industrial* – considerations...

## ➤ Engineering Practice:

- awareness of non-technical–*societal, health and safety, environmental, economic and industrial* implications of engineering practice...

Consistency in the accreditation procedures of different agencies within the EUR-ACE<sup>®</sup> system.

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### Duration of site visits:

**EAFSG:** “The site visit should last **at least two days**, including any preliminary meetings to evaluate the documentation and the visit to the HEI.”

**Actual practice by agencies:** 1.5 – 3.0 days

Time spent to check the evidence for programme outcomes is variable from agency to agency.

# Review of evidence for achievement of programme outcomes, during the site visit.

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Review of project work, final examination papers, design reports and other assessed work (with regards to the standard and modes of assessment as well as to the learning achievements of the students)

## **Good practice example:**

Review of evidence for programme evidence at least half day during the site visit, as well as critical review of the evidence before the visit.

# Composition of a review team of a programme:

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**EAFIG:** “The accreditation panel should consist of at least three persons, preferably more, including a student. At least one member of the accreditation panel should be an academic and at least one a practising engineering professional.

**Actual practice by agencies:** 3-5 members from academia and industry. Some agencies include a secretary or an official of agency. **Student members** are included to the review teams of **some** agencies. Some agencies prefer PhD and/or MSc students.

## EA-FSG: The site visit should include:

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- meeting with head of department / university;
- meeting with academic and support staff members;
- meetings with current students;
- meeting with graduates (former students)
- meeting with employers / industry / professional engineering organisations representatives;
- visits to facilities (libraries, laboratories, etc.);
- review of project work, final examination papers and other assessed work (with regards to the standard and modes of assessment as well as to the learning achievements of the students)

# Training of accreditation panel members



**EAFIG:** “All members of the accreditation panel should be sufficiently trained to enable them to participate expertly in the accreditation process... Accreditation agencies should promote short training courses for potential members of accreditation panels.”

## **Good practice examples:**

- Annual training courses/workshops for 1-2 days.
- Training videos for each reviewer before the site visit.
- Observatory visit for the first audit.
- On-line or face-to-face meeting of each team before the site visit.

# Consistency in accreditation decisions within the same agency



## Good practice examples and proposals:

- Consistency control of all review reports by a committee/editors before the accreditation decisions.
- Annual symposiums where SWOTS of the past campaign were disseminated to members, experts and institutions.
- Annual workshops for the team leaders, where they are briefed on the inconsistencies met on the previous evaluation period and what they should do during the team meetings to encourage the evaluators to arrive at consistent decisions.
- Members' and experts' training sessions to disseminate the consistency culture.
- Training of auditors in (1-2) days workshops

# Consistency in accreditation decisions within the same agency

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## Good practice examples and proposals:

- Communication of the reports to the accreditation committee members some weeks before the session
- Online or face to face meetings of team members, prior to the visit.
- Welcoming foreign quality assurance agencies as observers and participate as observers in foreign QA site-visits. Cross-agency use of evaluators adds to the sharing of good practice and to cross-agency consistency.
- Establish a pool of experts that individual EURACE agencies can occasionally take review team members from.
- If there are more than one programme for assessment an overall chair may be nominated with the role of ensuring consistency at the HEI visit location.

# Publication of Reports

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Institutional Evaluation and/or Programme Evaluation

Publication is expected from QA agencies recognized by EQAR. It is less common practice for accreditation agencies oriented towards professional recognition.

**Transparency versus Confidentiality**  
**Inspection or Evaluation**

# Internal Quality Assurance of Programmes

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**EAFSG:** “The programme should have quality assurance procedures that are consistent with the HEI quality assurance policy. It would be expected that there is a defined and documented procedure for **reviewing the programme at regular intervals** using all relevant data, including an evaluation of student achievement against the stated programme aims.”

# Assessment & Continuous improvement

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- Is there an appropriate ongoing assessment and evaluation process for programme outcomes, as well as teaching and learning processes?
- Is there any evidence for the use of the results of the systematic assessment process for continuous improvement?

# Quality assurance of accreditation agency

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- **Transparency and accountability:** The agency's administrative arrangements, procedures and rules should be fully documented and publicly available.
- It would be expected that the agency has quality assurance procedures to evaluate its activities. Such procedures should include a report at regular intervals, typically annually, to record and review its activities, and which should be independently, preferably externally, assessed.
- Assessment of evaluation team members (360° assessment)

# Thank you

<http://enaee.eu/>



# Multidisciplinary Context



- Knowledge & Understanding: (Bachelor; **Master**)
  - critical awareness of the wider *multidisciplinary context* of engineering and knowledge issues at the interface between fields.
- Engineering Design:
  - ability to develop and design ....that require integration of knowledge from *different fields* and non-technical...
- Communication & Team Working:
  - ability to function effectively in a national and international context, as an individual and as a member or leader of a team that may be composed of *different disciplines* and levels...

# Life-Long Learning

- ability to recognize the need for and to engage in independent life-long learning;
- ability to engage in independent life-long learning; ability to undertake further study autonomously.

IT MAY NOT BE STRAIGHTFORWARD  
TO ACHIEVE & PERIODICALLY ASSESS

# Involvement of Student Reviewer



## Best Practice in Accreditation (ENAEE-IEA)

Where the practice is to have a **student member(s)** of the visiting team, the following apply:

The student or students contribute to evaluation of programmes in areas where they are competent, including :

- I. Meeting with a cross-section of students in the programmes being assessed and student leadership;
- II. Participating in the evaluation of student services, assessment, teaching and learning facilities, library support, safety as instructed and practiced and the student body's understanding of the programme educational objectives.
- III. Participating in the evaluation of the learning conditions as perceived by the students: scheduling, pedagogical methods, workload, etc.