

## **What does the EUR-ACE<sup>®</sup> Bachelor and Master label stay for?**

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### Summary

Higher Education Institutions inside and outside Europe are asking increasingly for a EUR-ACE<sup>®</sup> label for their engineering degree programmes. Unfortunately so far the Programme Outcomes as defined by the EUR-ACE<sup>®</sup> Framework Standards, especially the crucial ones like Engineering Design and Engineering Practice, are not defined as subject-specifically as they should be. Therefore sometimes it is difficult to decide, whether a degree programme is really an engineering programme or not. Further that contributes to a lack of international recognition of EUR-ACE<sup>®</sup> accredited programmes. Such subject-specific programme outcomes should become developed soon. A second challenge for ENAEE is to define succinct claims for both the EUR-ACE<sup>®</sup> Bachelor label and the EUR-ACE<sup>®</sup> Master label. Proposals for such claims will be presented.

### Introduction

On its webpage ENAEE says<sup>1</sup>: EUR-ACE<sup>®</sup> is the European quality label for engineering degree programmes at First Cycle (Bachelor) and Second Cycle (Master) level. And: The EUR-ACE<sup>®</sup> framework and accreditation system provides a set of standards that identifies high quality engineering degree programmes in Europe and abroad. That brings forth the question: What is an engineering programme?

The EUR-ACE<sup>®</sup> Framework Standards are defining a set of six Programme Outcomes: Knowledge and Understanding; Engineering Analysis, Engineering Design, Investigations, Engineering Practice, and Transferable Skills, which are not defined subject-specifically. This contribution deals with the question, how to sharpen that set, especially with respect to crucial outcomes as Engineering Design and Engineering Practice? This is necessary to avoid awarding a EUR-ACE<sup>®</sup> label to a programme which is not really an engineering programme, and no longer to hinder international recognition of EUR-ACE<sup>®</sup> accredited programmes.

Further the contribution deals with the question how the information about that set can be formulated shortly in claims for the EUR-ACE<sup>®</sup> Bachelor and Master label, so that the set becomes more visible.

EUR-ACE<sup>®</sup> Framework Standards<sup>2</sup> not specific enough

Higher education institutions inside and outside Europe are asking increasingly for EUR-ACE<sup>®</sup> labels for their engineering programmes. Therefore peers and accreditation agencies have to decide in every case, whether a programme will be really an engineering programme or not. In most cases of civil engineering, electrical engineering, mechanical engineering, and process engineering programmes this will be not difficult. It will be more difficult with interdisciplinary programmes like industrial engineering and chemical engineering. Sometimes we find also so called engineering programmes like computer engineering, which in deed are informatics programmes. What is with degree programmes e.g. in geodesy / surveying , or in agronomy?

Unfortunately the six Programme Outcomes of the EUR-ACE<sup>®</sup> Framework Standards Knowledge and Understanding, Engineering Analysis, Engineering Design, Investigations, Engineering Practice, and Transferable Skills so far are not formulated subject-specifically enough to support a decision.

On the other side there exists some criticism on the “confusing plethora of accreditations” in the EUR-ACE system<sup>3</sup>, which hinders the recognition of EUR-ACE<sup>®</sup> accredited programmes in the USA.

Therefore it will to be an urgent challenge for ENAEE to sharpen that set, especially with respect to the crucial and holistic outcome Engineering Design by defining additional subject-specific criteria as e.g. in

- Civil Engineering:
  - Design of buildings, bridges, tunnels, hydrotechnics etc.
- Electrical Engineering / Information Technology:
  - Design of analogue and digital electric and electronic circuits, devices and products etc.
- Mechanical Engineering:
  - Design of machinery, equipment etc.
- Process Engineering:
  - Design of (physical, chemical, biological) production processes, design of process flow diagrams (PFD), design of key apparatus and equipment (e.g. reactors, columns ...) etc.

## Claims needed

In order to make EUR-ACE<sup>®</sup> labels more visible and to sharpen their message it seems to be necessary for ENAEE to formulate succinct claims. As an entry into this process two proposals will follow:

- The EUR-ACE<sup>®</sup> - Bachelor label confirms, that a degree programme offers a basic education in subject-specific competencies as Knowledge and Understanding, Engineering Analysis, Engineering Design, Investigations, Engineering Practice, and Transferable Skills suitable as entry into an engineering profession.
- The EUR-ACE<sup>®</sup> - Master label confirms, that a degree programme offers a deepening and broadening education in subject-specific competencies as Knowledge and Understanding, Engineering Analysis, Engineering Design, Investigations, Engineering Practice and Transferable Skills suitable to fulfil advanced engineering tasks.

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<sup>1</sup> <http://www.enaee.eu>, August 2013

<sup>2</sup> EUR-ACE Framework Standards for the Accreditation of Engineering Programmes, 2008-11-05

<sup>3</sup> **ANWAR, A. and RICHARDS, D.** Is the USA set to dominate accreditation of engineering education and professional qualifications? *New Civil Engineering International*. February 2013, pp. 27-33.