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Award of the EUR-ACE label

MSc HES-SO in Life Sciences | 19.02.2024

Content

1. Introduction

This document presents the proposal for the award of the EUR-ACE label on the basis of the self-evaluation with external expertise (AEE) of the Master degree in Life Systems of the University of Applied Sciences and Arts Western Switzerland (HES-SO). The AEE is part of the HES-SO's quality assurance process, and the Swiss Agency of Accreditation and Quality Assurance (AAQ) has been asked to accompany this procedure with a view to awarding the EUR-ACE label to the programme.

The proposal for the award of the label is made in accordance with the EUR-ACE® Framework Standards and Guidelines of 4th November 2021 (EAFSG).

2. Presentation of the MSc HES-SO in Life Sciences

The HES-SO offers a Master's degree programme (MSc) in Life Sciences, at the Haute Ecole d'ingénierie et d'architecture de Fribourg (HEIA-FR), the Haute Ecole d'ingénierie du Canton de Valais (HEI-VS) and the School of Viticulture and Enology of CHANGINS. In cooperation with three other Swiss UAS, BFH, FHNW and ZHAW, three Majors are available: Applied Biosciences (AB), Chemical Development and Production (CDP) and Viticulture & Enology (VE).

The first cohort began their studies in September 2009. On 15.10.2022, 62 students were enrolled. It is possible to obtain the Master degree in 1.5 years full-time or in 2.5 years in part-time.

A new framework curriculum (PEC_En-projet) will be adopted in 2023 and subsequently implemented. This document is written according to the model set by the Engineering and Architecture domain of the HES-SO (I&A domain). In particular, it makes it possible to establish the 10 teaching axes, based on the professions targeted by the graduates and the positioning of the programme in the academic world.

3. Self-evaluation with external expertise (AEE)

The evaluation procedure for the programme applying for the EUR-ACE label was carried out as part of a self-evaluation with external expertise (AEE) as provided for in the HES-SO's own quality assurance system. Such an evaluation takes place every 7 years.

The expert group consisted of :

- Jeronimo Camelo, Student, Master in Behaviour, Ecology and Conservation, UNIL (student profile)
- Bernhard Urwyler, Director / Board member of Dottikon Exclusive Synthesis AG, UrwylerChemPro GmbH (professional profile)
- Axel Blokesch, Head of Applied Biosciences programme, Frankfurt, University of Applied Sciences disciplinary profile)
- Horst Pick, PhD, Senior Scientist, Interdisciplinary Minor in Biotechnology, EPFL (quality profile), president of the group

This composition is in line with the recommendations of Annex 2, paragraph 2, of the EAFSG.

The self-evaluation report was provided to the experts in July 2023, i.e. more than one month before the on-site visit. It was organised according to the 19 evaluation criteria of the HES-SO quality assurance system. These criteria are largely consistent with the EUR-ACE criteria.

The on-site visit took place from 28 August 2023 afternoon to 30 August morning:

- First afternoon: information on the context, the HES-SO's quality assurance procedures; preliminary meeting of the experts
- Second day: interviews with managers, students, lecturers, administrative and technical staff, alumni professionals, visit of the facilities;
- Last morning: additional interview with the head of the programme and preparation of the preliminary conclusions of the evaluation which were presented at the end of the morning.

The on-site visit was organised in accordance with the EAFSG (Annex 2, paragraphs 3 and 4). The various interviews and the examination of the programme made it possible to assess the level of competence of the graduates. The external expert's report dated 28 September 2023 allows an assessment of the conformity of the programme with the EUR-ACE Standards.

4. Compliance with EUR-ACE Standards

4.1 Student Workload Requirements

According to the Standards, Chapter 2.2: ENAEE describes the Programme Outcomes for Master Degree programmes of a minimum of 90 ECTS credits.

Conclusion related to AEE Data Sheet

The programme has 90 ECTS credits (corresponding to one and a half years of higher education).

Compliance with the standard: achieved

4.2 Outcomes Framework for Master of Engineering programmes

Programme Outcomes describe the knowledge, understanding, skills and abilities which an accredited engineering degree programme must enable a graduate to demonstrate. The learning process should enable Master Degree graduates to demonstrate capacities in the following eight learning areas, according to chapter 2.3 of the EAFSG.

Knowledge and Understanding

Knowledge and understanding of the mathematics, computing and other basic sciences underlying their engineering specialisation, at a level necessary to achieve the other programme outcomes; knowledge and understanding of engineering fundamentals underlying their specialisation, at a level necessary to achieve the other programme outcomes, including some awareness at their forefront; awareness of the wider multidisciplinary context of engineering.

Engineering Analysis

Ability to analyse complex engineering products, processes and systems in their field of study; to select and apply relevant methods om established analytical, computational and experimental methods; to correctly interpret the outcomes of such analyses;

ability to identify, formulate and solve engineering problems in their field of study; to select and apply relevant methods from established analytical, computational and experimental methods; to recognise the importance of non-technical – societal, health and safety, environmental, economic and industrial – constraints.

Engineering Design

Ability to develop and design complex products (devices, artefacts, etc.), processes and systems in their field of study to meet established requirements, that can include an awareness of non-technical, societal, health and safety, environmental, economic and industrial considerations; to select and apply relevant design methodologies;

ability to design using an awareness of the forefront of their engineering specialisation.

Investigations

Ability to conduct searches of literature, to consult and to critically use scientific databases and other appropriate sources of information, to carry out simulation and analysis in order to pursue detailed investigations and research of technical issues in their field of study;

ability to consult and apply codes of practice and safety regulations in their field of study;

laboratory/workshop skills and ability to design and conduct experimental investigations, interpret data and draw conclusions in their field of study.

Engineering Practice

Understanding of applicable techniques and methods of analysis, design and investigation and of their limitations in their field of study;

practical skills for solving complex problems, realising complex engineering designs and conducting investigations in their field of study;

equipment and tools, engineering technologies and processes, and of their limitations in their field of study;

ability to apply norms of engineering practice in their field of study;

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

awareness of economic, organisational and managerial issues (such as project management, risk and change management) in the industrial and business context.

The expert group recommends to offer courses in business and management with a closer relationship to the respective specializations.

Making Judgements, Communication and Team-working

Ability to gather and interpret relevant data and handle complexity within their field of study, to inform judgements that include reflection on relevant social and ethical issues; ability to manage complex technical or professional activities or projects in their field of study, taking responsibility for decision making.

The expert group gives a positive feedback on the close relationship of the courses in data management to the respective specializations.

Lifelong Learning

Ability to recognise the need for and to engage in independent life-long learning; ability to follow developments in science and technology.

The expert group mention in their report some gaps in the lifelong learning process, but they agree that the self-evaluation has addressed this point already.

Conclusion related to AEE criteria 1, 5 and 18

The new framework curriculum (PEC_En-projet) presents the way how the programme has defined the 5 teaching axes and the expected outcomes to be achieved. The PEC starts from the general competences chosen for all the HES-SO engineering degrees (1.1 – 4.4), then presents six professional competences of the Master of Sciences in Life Sciences graduates (A-F) and finally details the specific competences expected together with the level of qualification to be achieved (understanding, applying, evaluating).

According to their analysis, the expert group had nothing more to add to the table presenting the conformity of training to EUR-ACE requirements in the Self-assessment report. Three specific observations are given above, with respect to “Engineering Practice”, “Making Judgements” and “Lifelong Learning”. The conformity of training has been further verified by studying two master theses which cover well the topic of the MLS.

Compliance with the standard: fully achieved

Recommendation concerning the criterion 6 and 18

- The expert group recommends to review and adapt the courses in “Business Management” with a closer relationship to the respective specializations, incorporating suggestions from the student representatives.

4.3 Programme Management

The five Standards concerning the programme management have been assessed in the framework of the AEE. The expert report allows the following conclusions to be drawn regarding compliance with the EAFSG, Chapter 2.4.

Programme Aims

The aims of accredited programmes must reflect the needs of employers and other stakeholders. The programme outcomes must be demonstrably consistent with the aims.

Conclusion related to AEE criterion 1 and 5

The expert group notes in its analysis that the competency profile shown is aligned with the needs of the industry, it has dedicated competencies of each specialization but it is not yet validated.

Compliance with the standard: partially achieved

Condition concerning the criterion 1 and 5

- Validate the final version of the PEC, including the competency profile, and establish a process to review the PEC periodically.

Teaching and Learning Process

The teaching and learning process must enable engineering graduates to demonstrate the knowledge, understanding, skills and abilities specified in the Programme Outcomes. The programme curriculum must specify how this is to be achieved.

Conclusion related to AEE criteria 5, 6 and 7

According to the experts, the diversity in the pedagogical approach is generally appreciated by the students. The experts have also recognised that the coordination among teachers has good level.

Compliance with the standard: fully achieved

Recommendation concerning the criterion 6 and 18

- The expert group recommends to review and adapt the courses in “Business Management” with a closer relationship to the respective specializations, incorporating suggestions from the student representatives.

Resources

The resources to deliver the programme must be sufficient to enable the students to demonstrate the knowledge, understanding, skills and abilities specified in the Programme Outcomes.

Conclusion related to AEE criteria 10, 11 and 12

According to the expert report, professors are well trained and have a good background for teaching as well as strong links with the professional world. The infrastructure is in excellent condition, up-to-date and regularly renewed, adapted to new technologies.

Compliance with the standard: fully achieved

Student admission, transfer, progression and graduation

The criteria for student admission, transfer, progression and graduation must be clearly specified and published, and the results monitored.

Conclusion related to AEE criteria 7 and 19

Admission and academic regulations are published and available to students and teachers. The experts note that each school has a different system to monitor overall students’ performance. They acknowledge that there are plans to develop tools to improve the extraction and exchange of these data.

Compliance with the standard: fully achieved

Internal Quality Assurance

Accredited engineering degree programmes must be supported by effective quality assurance policies and procedures.

Conclusion related to AEE criteria 16, 14 and 17

The expert group has identified several good mechanisms to improve the processes and the quality of teaching. But the level of participation is sometimes low and no alumni are included included in quality assurance policies.

Compliance with the standard: fully achieved

Recommendation concerning the criterion 14 and 16

- The expert group recommends to evaluate whether the support of an “Alumni Association” of MLS graduates could help to improve the quality assurance policies.

4.4 Statement of the programme’s position on the expert report

In the position statement dated 18 October 2023, the responsible HES-SO Master and the programme manager express their thanks to the expert group for its report. They comment on each of the recommendations by showing how and by whom they can be followed up and which measures can be taken.

5. Proposal for the award of the EUR-ACE label

The responsible AAQ Project Manager considers that the procedure complies with the EUR-ACE® Framework Standards and Guidelines of 4th November 2021 (EAFSG) and that the award of the EUR-ACE label can be envisaged.

On the basis of the self-assessment report, the on-site visit and the expert report, the project coordinator proposes to the AAQ that the MSc HES-SO in Life Sciences be awarded the EUR-ACE label for a period of 6 years.

The proposal to award this label is accompanied by one condition and two recommendations, as follows:

1. Condition concerning the criterion 1 and 5
   - The programme must obtain the validation of the final version of the PEC, including the competency profile, and establish a process to review the PEC periodically
2. Recommendation concerning the criterion 6 and 18
   - The expert group recommends to review and adapt the courses in "Business Management" with a closer relationship to the respective specializations, incorporating suggestions from the student representatives.

3. Recommendation concerning the criterion 14 and 16

   – The expert group recommends to evaluate whether the support of an “Alumni Association” of MLS graduates could help to improve the quality assurance policies.

6. Decision to award the EUR-ACE label

The AAQ follows the proposal of the project coordinator and decides to award the EUR-ACE label for a period of 6 years.

The AAQ expects a follow-up report at the latest 2 years after the award of the EUR-ACE label. This report can be the copy of the report to be provided to the domain (*bilan de l’AEE*). The follow-up report must address the condition formulated in order to satisfy criteria 1 and 5. It must also report on the follow-up of the recommendations at programme level or under the responsibility of the university, the I&A domain and the Teaching Committee respectively.

7. Appendix

- Decision of the Rectorate of the HES-SO of 30 April 2024 (4 pages)
- Statement of the programme’s position, 18 October 2023 (4 pages)
- Expert report, 28 September 2023 (11 pages)

The appendices are available on the HES-SO website at the following address: https://www.hes-so.ch/la-hes-so/a-propos/amelioration-continue/evaluation-des-enseignements/resultats-des-evaluations.

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