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Standards for the Evaluation of Engineering Programmes

Table of Contents

Introduction	1
Standards for Engineering Programmes.....	2
Standard 1. Mission, Goals and Governance.....	2
Standard 2. Curriculum.....	2
Standard 3. Student Academic and Support Services.....	3
Standard 4. Assessment and Student Success	3
Standard 5. Faculty.....	4
Standard 6. Budget, Resources, and Facilities	4
Standard 7. Continuous Improvement.....	4
Lebanese Qualifications Framework	6
LQF levels 6 and 7 for Engineering.....	6

Introduction

The Erasmus+ Project “Programme Evaluation for Transparency and Recognition of Skills and Qualifications” has defined a set of standards and procedures for the evaluation of programmes in the Lebanese Higher Education. These standards have been shaped for the domain of Engineering. The Lebanese Qualifications Framework (LQF) has also been transformed to a sectoral one for the Engineering field. The standards and the sectoral LQF are provided in the following.

Standards for Engineering Programmes

Standard 1. Mission, Goals and Governance

- a. The programme has clearly defined, comprehensive mission that include measurable programme goals.
- b. The programme's mission and goals are consistent with mission of the faculty and the University including, where applicable, contribution to strategic initiatives.
- c. The programme has an organizational structure that supports the achievement of its mission, and the success of its students, faculty and staff.

Standard 2. Curriculum

- a. Programme provides broad, well-integrated knowledge of the discipline, is responsive to changes in the field, and exhibits a curricular design that ensures graduates demonstrate disciplinary knowledge appropriate to their degree.
- b. The academic programme has specific learning outcomes that are designed to meet the programme's intended purpose.
 - Learning outcomes are appropriate for the degree designation (i.e., associate degree vs. bachelor's degree vs. master's degree vs. doctoral degree or the level in the LQF when applicable).
 - Course requirements and delivery mechanisms provide sufficient opportunities for students to meet learning outcomes.
 - *Course should be organised into:*
 1. *Basic and fundamental sciences*
 2. *Engineering topics*
 3. *General education*
 - The programme learning outcomes address the major issues and concerns in the discipline or professional area.
 - *The learning outcomes of the programme must include elements relative to problem solving, engineering design and enquiry competences.*
- c. The learning outcomes defined for the courses build together the programme learning outcomes.
- d. The programme curriculum shall be aligned with the Lebanese Qualifications Framework when applicable.
- e. The programme learning outcomes address the major issues and concerns in the engineering discipline or professional area.

- f. *The delivery mechanisms for each course are defined. The engineering programmes should have sufficient learning activities with appropriate delivery/teaching and learning mechanisms, such as:*
- *Practicum*
 - *Individual Collective Project*
 - *Internship*

Standard 3. Student Academic and Support Services

- a. The institution provides student administrative services according to established and publicly declared policies in the following areas: Recruitment, Admission, Financial aid, Scholarship applications, Transfer credit and prior learning evaluation, and Student records management.
- b. The process for the evaluation and recognition of prior learning shall be documented and public.
- c. The institution provides student support services, including:
- i. Advising and assessment as needed
 - ii. Advising and assessment for credit transfer and recognition of prior learning
 - iii. Academic support for students with disabilities and other learning needs
 - iv. Physical or mental health counselling
 - v. Orientation services
 - vi. Career services.
- d. The programme has in place remedies, where necessary, to ensure student progression and completion.
- e. The programme routinely evaluates the effectiveness of its support services including advising.
- f. Based on the evaluation results, the Programme makes appropriate adjustments necessary to support student achievement.

Standard 4. Assessment and Student Success

- a. The programme has an appropriate number of students to ensure viability.
- b. The retention rate is sufficiently high to ensure viable completion numbers.

- c. The programme assesses and evaluates student achievement of the Programme learning outcomes rigorously through direct and indirect methods.
- d. Formative and summative assessments inform faculty members and students of student progress in the programme. Assessment results are communicated in ways that enable improvements.

Standard 5. Faculty

- a. The number, qualifications, and credentials of faculty members are adequate.
- b. Faculty resources are sufficient to meet the teaching, scholarship, service, and advising needs of the programme.
- c. Faculty development is assured as appropriate to the teaching in the discipline and advancing disciplinary knowledge.
- d. The programme regularly evaluates the effectiveness of faculty with respect to departmental, college, and institutional criteria. The evaluation includes teaching effectiveness, evidence of research, and service to the institution. The evaluation also includes scholarly activity, grants and awards.

Standard 6. Budget, Resources, and Facilities

- a. The programme's allocated resources are sufficient to support its goals and objectives. The resources include:
 - i. Financial resources
 - ii. Human resources
 - Physical facilities (e.g., classrooms, laboratories) under the disposal of the student population and the programmes offered. Library resources and services support
 - Technology resources (e.g., hardware, software and professional development) to advance teaching and learning
- b. Policies are in place to ensure the safety and security of students, faculty and staff.

Standard 7. Continuous Improvement

- a. The programme engages in periodic self-review, has established evaluation procedures, and shows evidence of improvements based on these processes.

- b. Multiple direct and indirect assessments are used to inform continuous programme improvement.
 - Assessments are linked to the programme's mission and goals
 - Assessments include student performance in courses, labs and clinical experiences, and alumni performance in the workforce
 - Faculty members are involved in defining the expected outcomes and in determining whether these outcomes are achieved
 - Assessments provide faculty with the opportunity to examine student performance in the context of progressively more challenging problems, projects, and standards for performance
- c. The programme engages in periodic self-evaluation, has established evaluation procedures, and shows evidence of improvements based on these processes
- d. Faculty and administrators regularly review the effectiveness of the assessment system
- e. Assessment results are available to stakeholders, including faculty members and students

Lebanese Qualifications Framework

LQF levels 6 and 7 for Engineering

The following table provides the sectoral LQF for engineering.

	Knowledge	Know-how	Social skills
Level 6	Has in-depth knowledge in a sphere of work or study requiring a critical understanding of theories and principles applicable to a range of professional situations and diverse studies.	Can devise technical, methodological and conceptual solutions and demonstrate expertise and innovative ability to resolve complex and unpredictable problems in a specialist sphere of work or study, using advanced skills.	Can implement unpredictable complex technical or professional activities or projects, including responsibilities in terms of taking decisions in professional or study contexts requiring one to adapt/adaptation to new technologies and methods and to new forms of organisation. Can take on responsibilities in connection with individual and collective professional development.
	Assimilate and use scientific and technical engineering resources	Solve engineering problems by applying principles of engineering, science and mathematics Design, implement and test engineering solutions, systems and services	Communicate clearly and effectively Work in a team and lead the development of engineering practices and processes
level 7	Has highly specialised knowledge, some of which are in the vanguard of knowledge in a sphere of work or study, based on original ideas and/or research. Has critical awareness of knowledge in a certain field and at the interface of several fields.	Can solve problems relating to research and innovation, to develop new knowledge and new procedures by mobilising highly specialised skills. Can integrate knowledge from different areas and communicate the knowledge and the results of activities with specialists and non-specialists.	Can act on complex, unpredictable professional or study contexts that require new strategic approaches. Can make judgements and exercise responsibilities, considering the social and ethical aspects associated with the decisions. Can take on responsibilities to contribute to knowledge and professional practices and/or to revise the strategic

			performance of team.
	Respect economic/commercial dimension, quality, competitiveness, productivity, safety, and sustainability in the design and implementation of an engineering solution	Advance engineering knowledge, practices, processes and systems Apply enquiry competences and search for new engineering solutions and systems	Apply professional codes and respect ethical and professional values while exercising engineering Adapt to new working contexts Work in an international context showing good linguistic skills and cultural knowledge