QUACING Agency

Agency for the Quality Certification and
EUR- ACE Accreditation of Engineering Study Programmes

QUACING Standards and Guidelines for EUR-ACE Accreditation of Engineering Study Programmes (QUACING Model)

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Index

Summary

The document presents the QUACING standards and guidelines for the accreditation of Engineering Study Programmes consistent with the *EUR-ACE Framework Standards and Guidelines* established by the 'European Network for the Accreditation of Engineering Education (ENAEE)'.

After the introduction, the second section summarizes and describes the ENAEE requirement for the EUR-ACE accreditation.
The standards and guidelines for the accreditation of Engineering Study Programmes are presented in the third section.

1. Introduction

Coherently with the ISO 9000 definition of quality, with '**study programme quality**' it is meant "the grade (level) of fulfilment of the educational objectives established coherently with the needs and expectations of all those who are interested in the educational service provided". In other words, "the level of accomplishment of the quality requirements established coherently with the needs and expectations of all the stakeholders".

Quality assurance (QA) is the instrument to make study programme (SP) quality transparent and trustworthy for all the stakeholders, students and employers first of all.
Coherently with the ISO 9000 definition of QA, with '**study programme quality assurance**' it is meant "the whole of the activities (processes) for the management of the educational service aimed at achieving the established educational objectives and then at 'ensuring trust' in meeting the quality requirements to all the stakeholders".

The meaning of the terms used in the document can be found in the document *QUACING Glossary of Terms*.

The document presents the QUACING standards and guidelines for the EUR-ACE accreditation of Engineering Study Programmes (ESPs), defined consistently with the *EUR-ACE Framework Standards and Guidelines* [1] established by the 'European Network for the Accreditation of Engineering Education' (ENAEE, www.enaee.eu)[1].

[1] ENAEE was established in 2006. Its mission is to serve the public and society through the promotion and advancement of engineering education in Europe and abroad. ENAEE aims at building a pan-European framework for the accreditation of engineering SPs, in order to enhance the quality of engineering graduates, to facilitate the mobility of professional engineers and to promote quality and innovation in engineering education.

To achieve these goals, ENAEE has established a de-centralized system for the standards of accreditation of engineering education degree programmes, leading to pan-European recognition of national accreditation decisions.

ENAEE does not accredit engineering degree programmes. ENAEE carries out its mission by evaluating quality assurance and accreditation agencies in the EHEA in respect of their standards and procedures when accrediting engineering degree programmes. Those agencies which satisfy ENAEE in respect of these matters are authorized by ENAEE to award the EUR-ACE label to the engineering degree programmes that they accredit.
The agencies authorized to award the EUR-ACE label are 15. To date, the ESPs accredited are more than 2.000, not only in Europe.

A 'Mutual Recognition Agreement of EUR-ACE Labelled Engineering Study Programmes' [2] among all the Agencies authorized by ENAEE to award the EUR-ACE label was signed on 19 November 2014 in Brussels.

Since the beginning EUR-ACE accreditations have been implemented also in non-EU Countries, like Russia Federation and Turkey. There is convincing evidence that the EUR-ACE model can be successfully applied to other Regions outside the EU.

2. EUR-ACE Standards and Guidelines for the Accreditation of Engineering Study Programmes

EUR-ACE (EURopean ACcredited Engineer) is the label awarded to ESPs at Bachelor and Master level, run by ENAEE and listed among the 'European Quality labels' by the European Commission.

The standards which ENAEE requires of engineering degree programmes which are accredited by agencies are described in the EAFSG.
They are intended to be widely applicable and inclusive so that they can be applied to all branches of engineering; and to reflect the diversity of engineering degree programmes in the European Higher Education Area (EHEA), which provides the education necessary for graduates to enter the engineering profession and to have their qualifications recognised throughout the area**.**

The EAFSG are for the use of established agencies which have well developed policies and procedures that are continuously under review. They are also aimed at new agencies which may wish to use the information in the EAFSG to assist them as they develop their policies and procedures for the accreditation of engineering degree programmes and apply for authorisation to award the EUR-ACE® label.

The EUR-ACE standards for accreditation are defined in terms of:

- student workload;
- programme outcomes;
- programme management.

2.1 Student Workload

The student workload requirements are compliant with the overarching *Framework of Qualifications for the European Higher Education Area* [4], as adopted by the Ministers of Education of the Bologna Process at their meeting in Bergen in May 2005, including the 'Dublin Descriptors'.
The framework "comprises three cycles (including, within national contexts, the possibility of intermediate qualifications), generic descriptors for each cycle based on learning outcomes, and credit ranges in the first and second cycles".

The workload requirements are described using European Credit Transfer System credits [5].

ENAEE is interested to spread the EUR-ACE label in Countries with an organization of their HE consistent with the Bologna process requirements. To this end, ENAEE policy is to spread the EUR-ACE accreditation through the identification/creation of National Agencies to be authorized to award the EUR-ACE label. Significant results have already been obtained in the Central Asian region, where University of Florence run the TEMPUS project QUEECA (Quality of Engineering Education in Central Asia) [3].

ENAEE describes the Programme Outcomes for Bachelor and Master Degree programmes normally structured as follows:

- Bachelor Degree programmes, of a minimum of 180 ECTS credits.
- Master Degree programmes, of a minimum of 90 ECTS credits (60 in some educational systems).
- Master Degree programmes which are integrated and which, normally, do not include the award of a Bachelor Degree, should comprise ECTS credits consistent with the above: i.e. a minimum of 270 ECTS credits (240 in some education systems).

2.2 Programme Outcomes

The Programme Outcomes (POs) describe the knowledge, understanding, skills and abilities which an accredited ESP must enable a graduate to demonstrate. They apply to accredited ESPs which are to be awarded a EUR-ACE label by an authorised agency.
The established POs are compliant with the Dublin Descriptors included in the overarching *Framework of Qualifications for the European Higher Education Area* (QF-EHEA).
The Dublin descriptors for the first cycle correspond to the learning outcomes for 'level 6' of the *European Qualifications Framework for Lifelong Learning* (EQF-LLL) [6], developed by the European Commission and signed on 23 April 2008 by the Presidents of the European Parliament and of the Council of the European Union, and those for the second cycle correspond to the learning outcomes for level 7.
The POs are consistent also with the provisions of the EQF-LLL.

POs specified in EAFSG are intended to be applicable to the full range of Bachelor and Master Degree programmes in engineering offered in European Higher Education Institutions (HEIs). They have to be considered as the 'minimum threshold' defined by the ENAEE community and to be fulfilled in order to assure the quality of ESPs.

The POs can be used in both the design (by engineering academics) and the evaluation (by accreditation agencies) of SPs in all branches of engineering and for different profiles.

The Programme Outcomes are described separately for both Bachelor and Master Degree programmes with reference to the following eight 'learning areas':

- Knowledge and understanding,
- Engineering Analysis,
- Engineering Design,
- Investigations,
- Engineering Practice,
- Making Judgements,
- Communication and Team-working,
- Lifelong Learning.

2.3 Programme Management (Standards and Guidelines for Quality Assurance)

The programme management requirements are expressed in terms of standards and guidelines for QA, consistent with the *Standards and Guidelines for Quality Assurance in the European Higher Education Area* (ESG) [7], as adopted by the Bologna Process ministerial summit in Bergen (Norway) in 2005 and revised in Yerevan (Armenia) in 2015.

The programme management requirements are articulated in five standards that correspond to the key management areas of every kind of study programme and must be evaluated if an agency is to be authorised to award the EUR-ACE label, identified as:

- Programme Aims
- Teaching and Learning Process
- Resources
- Student Admission, Transfer, Progression and Graduation
- Internal Quality Assurance

The standards are shown in Table 2.1.

Table 2.1 – Standards

1. 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.
2. 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.
3. 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.
4. 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.
5. Internal Quality Assurance Accredited engineering degree programmes must be supported by effective quality assurance policies and procedures.

The guidelines that follow the standards are not prescriptive but are intended to assist HEIs and agencies in meeting the standards. Programme managers are free to satisfy the standards in accordance with their own traditions and resources.

In *Annex 1 - Guidelines on Programme Self-Assessment Review by HEI and Accreditation Requirements of Agency*, the EAFSG provide an indication of the documentation to be required by accreditation agencies and provided by ESPs and of the questions to be considered in the self-assessment by ESPs and in the external assessment by accreditation agencies in an accreditation process. The indication are provided as a guide to assist accreditation agencies and HEIs when these agencies are applying for authorisation to award the EUR-ACE label. They are not intended to be prescriptive.

3. QUACING Standards and Guidelines for the EUR-ACE Accreditation of Engineering Study Programmes

Consistently with the EUR-ACE standards for accreditation, the QUACING standards and guidelines for the EUR-ACE accreditation of Engineering Study Programmes are defined in terms of student workload, programme learning outcomes (or, better, 'programme learning descriptors') and standards and guidelines for QA.

Only ESPs that fulfil all the national norms and requirements can be admitted to the accreditation process.

3.1 Student workload

Student workload of ESPs is established consistently with the duration of the ESPs:

- a minimum of 180 ECTS credits or credits equivalent to 180 ECTS credits in other credit systems (3 years of duration) at Bachelor level;
- a minimum of 120 ECTS credits or credits equivalent to 120 ECTS credits in other credit systems (2 years of duration) at Master level or a minimum of 60 ECTS credits or credits equivalent to 60 ECTS credits in other credit systems (1 year of duration) at Master level for Master Degree programmes that include the award of a Bachelor degree of at least 240 ECTS credits or credits equivalent to 240 ECTS credits in other credit systems (4 years of duration);
- a minimum of 300 ECTS credits or credits equivalent to 300 ECTS credits in other credit systems (5 years of duration) for Master Degree programmes that are integrated and that, normally, do not include the award of a Bachelor degree.

3.2 Programme Learning Descriptors

As already said, in the EAFSG the Programme Outcomes (POs) describe the knowledge, understanding, skills and abilities which an accredited ESP must enable a graduate to demonstrate They have to be considered as the 'minimum threshold' defined by the ENAEE community and to be fulfilled in order to assure the quality of ESPs.
In the QUACING Model, the EAFSG POs are substituted by the 'Programme Learning Descriptors (PLDs)' as elaborated in the context of the project *Measuring and Comparing Achievements of Learning Outcomes in Higher Education in Europe* (CALOHEE, www.calohee.eu), co-financed and strongly supported by the European Commission as part of its Action Programmes for Higher Education, whose aim was to develop an infrastructure which allows for comparing and measuring learning in a (trans)national perspective.
The name 'Programme Learning Descriptors' is fully justified by the fact that, as EAFSG POs[2], also PLDs do not define 'learning outcomes' but describe the content in:

- knowledge and understanding,
- skills,
- autonomy and responsibility

that should characterize the learning outcomes of study programmes applying for EUR-ACE accreditation.

[2] The EUR-ACE programme outcomes, revised in 2013, are not fully consistent with the current requirements for the definition of 'learning outcomes' (see, for example, 'ECTS Users' Guide 2015, 3.3 The programme learning outcomes', https://ec.europa.eu/education/ects/users-guide/docs/ects-users-guide_en.pdf).

As EAFSG POs, the PLDs are described separately for both Bachelor and Master Degree programmes with reference to the following nine 'learning areas':

- Knowledge and understanding,
- Engineering Analysis,
- Engineering Design,
- Investigations,
- Engineering Practice,
- Making Judgements,
- Team-working,
- Communication,
- Lifelong Learning,

the same as in EAFSG, considering that the 'Team-working' and 'Communication' learning areas correspond to the 'Communication and Team-working' learning area of the EAFSG.

The established PLDs are shown in Annex 1. As in the POs established in EAFSG, the main difference between the descriptors at Bachelor and Master level regards the typology of problems / products, processes and systems / issues / activities that can be solved / designed / investigated / conducted. At Bachelor level the engineering problems / products, processes and systems / issues / activities that can be solved / designed / investigated / conducted are problems / etc. in the field of study defined as 'complex', where complex means problems / etc. that cannot be solved / etc. without:

- knowledge and understanding of mathematics, sciences and engineering disciplines underlying engineering specialisation, and/or
- knowledge and understanding that support solving of engineering problems, designing of engineering products, processes and systems, investigation of engineering issues, conducting engineering activities, and/or
- knowledge and understanding of engineering practice.

At Master level the engineering problems / products, processes and systems / issues / activities that can be solved / designed / investigated / conducted are problems / etc. in the field of study defined as 'complex' – where 'complex' has the same meaning as for Bachelor level – that may be new or unfamiliar, involve considerations from outside the field of study, incompletely defined and /or conflicting issues and non-technical constraints, and require original/innovative thinking.

The established PLDs are substantially consistent with but more 'flexible' than the EAFSG POs, thus facilitating the assessment of the compliance of ESPs' learning outcomes with the EUR-ACE learning requirements.
They are compliant with the Dublin Descriptors included in the QF-EHEA and their requirements in terms of responsibility and autonomy make them fully consistent also with the provisions of the EQF-LLL.
As EAFSG POs, they are intended to be applicable to the full range of First Cycle and Second Cycle study programmes in engineering internationally offered.

The PLDs describe the programme learning outcomes that accredited ESPs must meet, but do not prescribe how they are realised. For example, the requirements of one PLD could be satisfied within two or more course units, while the requirements of more than one PLD could be satisfied within a single course unit such as project work. Similarly, it is possible that some ESPs are designed such that the learning outcomes of the transferable learning areas (Making Judgment, Communication and Team Working, Lifelong Learning) are taught and assessed entirely within course units designed to satisfy the requirements of other PLDs, whereas in other ESPs the transferable skills requirements

are taught and assessed in course units designed specifically for this purpose. No restriction is implied or intended by the PLDs in the design of ESPs to meet them.

3.3 Standards and Guidelines for Quality Assurance of Engineering Study Programmes

Coherently with the ENAEE programme management requirements, also the QUACING standards and guidelines for the quality assurance of ESPs are articulated in five standards:

A - Programme Aims
B - Educational Process
C - Resources
D - Monitoring
E - Management System

The established standard statements are shown in Table 3.1.

Table 3.1 – Standards for the QA of ESPs

Standards	
A Programme Aims	The engineering study programme should identify the educational needs of the labour market of reference and other stakeholders, establish programme educational objectives coherent with the mission of the institution the study programme belongs to and the identified educational needs, and programme learning outcomes coherent with the established programme educational objectives.
B Educational process	The engineering study programme should assure students educational activities consistent with the national standards, if any, and able to achieve the established programme learning outcomes through contents, methods, workload and times adequately designed and planned, promote a student-centred teaching and learning approach, assure a correct assessment of students' learning through suitable assessment methods and criteria. The engineering study programme should also define appropriate rules covering student admission, recognition, progression and attestation and keep under control the development of the educational process.
C Resources	The engineering study programme should have at disposal teaching staff, facilities, financial resources, student support services and partnerships adequate to the achievement of the learning outcomes and able to make easier the students' progression in their studies.
D Monitoring	The engineering study programme should monitor the results of the educational process, at least with respect to incoming students, students' progression in their studies, students' learning, graduates' placement, students' feedback on the educational process and employed graduates' and employers' feedback on the graduates' education, in order to check the adequacy and effectiveness of the educational service provided.
E Management System	The institution the engineering study programme belongs to should have a public policy and appropriate processes and organization for the quality assurance of study programmes. The policy should be put into practice through the definition and adoption of a management system of the study programmes, able to assure their quality and the continual improvement of the effectiveness

	of the processes for the study programme management and of the associated results.

The definition of the QA system of an ESP requires the identification of all the activities (processes) for the 'management for quality' of the ESP.
The fundamental processes associated to each QUACING standard to be considered fundamental to assure the quality of ESPs have been identified consistently with the indication of Appendix 1 of the EAFSG.
They are shown in Table 3.2.

Table 3.2 - Fundamental processes of the QA

Standard	Fundamental processes
A Programme Aims	A1 - Identification of the educational needs of the labour market and other stakeholders
	A2 - Definition of the programme educational objectives
	A3 - Definition of the programme learning outcomes
B Educational Process	B1 - Design of the educational process
	B2 – Definition of the students' admission, recognition, progression and attestation rules
	B3 - Planning of the educational process
	B4 - Management of the educational process
C Resources	C1 - Identification and appointment of the teaching staff
	C2 - Identification and allocation of facilities (in particular: lecture and study rooms, laboratories, libraries) and support staff
	C3 - Identification of the needs and allocation of financial resources
	C4 - Organisation and management of student support (orienteering, tutoring and assistance) services
	C5 - Establishment of partnerships with national and international businesses, research institutions and other Higher Education Institutions for carrying out students' external education and international mobility
D Monitoring	D1 - Monitoring of incoming students
	D2 - Monitoring of students' progression in their studies
	D3 - Monitoring of students' learning
	D4 - Monitoring of students' feedback on the educational process
	D5 - Monitoring of graduates' placement
	D6 - Monitoring of employed graduates' and employers' feedback on the graduates' education
E Management System	E1 - Definition of the policy, processes and organization of the Higher Education Institution for the quality assurance of study programmes
	E2 - Definition of the management system of the engineering study programme
	E3 - Review of the engineering study programme
	E4 - Provision of public access to information on the engineering study programme

For each identified process, the 'quality requirements', i.e. the needs or expectations for quality, have been established consistently with the guidelines of the ENAEE programme management requirements.
They are shown in Table 3.3.

Table 3.3 - Quality Requirements

Standards	Quality Requirements
A Programme Aims	**Quality Requirement A1 - Educational needs of the labour market and other stakeholders** The engineering study programme should identify the educational needs of the labour market of reference and other stakeholders.
	Quality Requirement A2 - Programme educational objectives The engineering study programme should define programme educational objectives consistent with the mission of the institution the study programme belongs to and the identified educational needs.
	Quality Requirement A3 – Programme learning outcomes The engineering study programme should define programme learning outcomes, in terms of what students are expected to know, understand and/or be able to demonstrate after completion of the educational process, consistent with the national qualification framework, if any, the established programme educational objectives and the programme learning descriptors for ESPs.
B Educational Process	**Quality Requirement B1 - Design of the educational process** The engineering study programme should design a curriculum and characteristics of the course units and of the graduation exam consistent with the national standards, if any, and the established programme learning outcomes. The curriculum should embed a student-centred teaching and learning approach. The engineering study programme should also define assessment methods and criteria able to ensure a correct assessment of the students' learning.
	Quality Requirement B2 - Admission, recognition, progression and attestation The engineering study programme should establish rules covering all phases of the student 'life cycle', and in particular student admission, recognition, progression and attestation.
	Quality Requirement B3 - Planning of the educational process The engineering study programme should plan the development of the educational process in order to enable students to achieve the programme learning outcomes in the expected time, according to a gradual process and through coherent and coordinated educational activities.
	Quality Requirement B4 - Management of the educational process The engineering study programme should manage the educational process coherently with the designed and planned development and keep under control its development, in order to resolve any urgent and immediate problem and to check the adequacy of the assessment tests and of the final work/thesis to the achievement of the established programme learning

	outcomes specific of the course units and the correctness of the evaluation of the students' learning.
C Resources	**Quality Requirement C1 - Teaching staff** The engineering study programme should have at disposal teaching staff, including teaching support staff, quantitatively and qualitatively adequate for the achievement of the established learning outcomes by students. The teaching staff should be appointed according to pre-definite criteria of recruitment/selection/choice and the programme should offer the teaching staff the opportunity to improve their teaching skills and the use of new technologies.
	Quality Requirement C2 - Facilities and support staff The engineering study programme should have at disposal facilities (lecture and study rooms, laboratories, libraries), with the associated equipment, and technical-administrative staff quantitatively and qualitatively adequate for the development of the established educational activities as designed and planned and able to allow the application of the established educational methods.
	Quality Requirement C3 - Financial resources The engineering study programme should have at disposal financial resources adequate for the development of the educational process according to the designed and planned activities.
	Quality Requirement C4 - Student support services The engineering study programme should have at disposal student support (orienteering, tutoring and assistance) services relevant to the educational process and able to make easier students' learning and progression in their studies.
	Quality Requirement C5 - Partnerships The engineering study programme should have partnerships with national and/or international businesses, research institutions and other Higher Education Institutions quantitatively and qualitatively adequate for carrying out students' external education and mobility.
D Monitoring	**Quality Requirement D1 - Incoming students** The engineering study programme should monitor the incoming students in order to check its attractiveness.
	Quality Requirement D2 - Students' progression in their studies The engineering study programme should monitor the students' progression in their studies in order to check the effectiveness of the educational process.
	Quality Requirement D3 - Students' learning The engineering study programme should monitor the students' learning in order to check the effectiveness of the course units.
	Quality Requirement D4 - Students' feedback on the educational process The engineering study programme should monitor the students' feedback on the educational process in order to check the perceived adequacy and effectiveness.
	Quality Requirement D5 - Graduates' placement The engineering study programme should monitor the graduates' placement in order to check the demand of the granted qualification and the

	correspondence of the programme educational objectives and programme learning outcomes to the educational needs of the labour market.
	Quality Requirement D6 - Employed graduates' and employers' feedback on the graduates' education The engineering study programme should monitor the employed graduates' and employers' feedback on the graduates' education in order to check the correspondence of the programme educational objectives and programme learning outcomes to the educational needs of the labour market.
E Management System	**Quality Requirement E1 - Policy, processes and organization of the Higher Education Institution for the quality assurance of study programmes** The institution the engineering study programmes belongs to should have a public policy and appropriate processes and organization for the quality assurance of study programmes.
	Quality Requirement E2 - Management system of the study programme The engineering study programme should implement an appropriate management system, through the identification of the quality assurance processes and the definition of a relevant organisational structure.
	Quality Requirement E3 - Review The engineering study programme should periodically review the processes for the study programme management and the associated results, in order to guarantee their constant adequacy and effectiveness or to promote the improvement of the effectiveness of the processes for the study programme management and of the associated results. Students and representatives of the labour market of reference should be involved in the review process.
	Quality Requirement E4 - Publicly availability of information The engineering study programme should make publicly available full, up to date, easily acquired information, both quantitative and qualitative, on study programme aims, educational process, resources and results.

Finally, the expected activities, i.e. the activities to be managed for fulfilling the QRs, and the information and data required in order to provide evidence of the quality of the educational service offered, and therefore to assure its quality, have been identified according to the indication of Appendix 1 of the EAFSG.
Information and data to be documented will have to fulfil specific characteristics.
The documentation should be easily accessible on the net, have a simple structure and be drawn up in a short and essential form, which shall optimize all aspects related to the interaction with all the stakeholders.
Furthermore, the documentation will have to be prepared according to drawing-up modes (extension, language, reading format) homogeneous at national (and international) level.

The Standards and Guidelines (i.e. QRs, with the associated expected activities for their accomplishment and required documentation) for Quality Assurance of Engineering Study Programmes are reported in Annex 2.
It is important to note that the QUACING Model assumes that the ESP is the only structure in charge of the management of the processes associated to the QRs. In some cases, the structures in charge could be others, in particular the structure the ESP belongs to. This does not imply any change as for both the QRs and the expected activities.

References

[1] ENAEE, *EUR-ACE Framework Standards and Guidelines* (EAFSG), http://www.enaee.eu/wp-assets-enaee/uploads/2017/11/EAFSG-Doc-Full-status-8-Sept-15-on-web-fm.pdf

[2] ENAEE, *Mutual Recognition or EUR-ACE Labelled Engineering Degree programmes*, http://www.enaee.eu/wp-assets-enaee/uploads/2012/01/MRA-agreement-A3-signed.pdf

[3] *The QEECA Experience*, http://www.fupress.com/catalogo/the-queeca-experience/3290

[4] Bologna Working Group on Qualifications Frameworks, *A Framework for Qualifications of the European Higher Education Area*, http://ecahe.eu/w/images/7/76/A_Framework_for_Qualifications_for_the_European_Higher_Education_Area.pdf

[5] ECTS Users' Guide 2015, https://ec.europa.eu/education/ects/users-guide/docs/ects-users-guide_en.pdf

[6] RECOMMENDATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 23 April 2008 on the establishment of the European Qualifications Framework for lifelong learning, https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32008H0506(01)&from=EN

[7] ENQA and others, *Standards and Guidelines for Quality Assurance in the European Higher Education Area*, http://www.enqa.eu/wp-content/uploads/2015/11/ESG_2015.pdf

Annex 1 - Programme Learning Descriptors

Learning Areas	Programme Learning Descriptors for Engineering Bachelor Degree Programmes		
	Content in Knowledge and Understanding	**Content in Skills**	**Content in Autonomy and Responsibility**
1. Knowledge and Understanding	Demonstrate knowledge and understanding of mathematics as well as sciences and engineering disciplines underlying engineering specialisation at a level necessary to achieve the other programme outcomes.	Apply knowledge and understanding of mathematics as well as sciences and engineering disciplines underlying engineering specialisation to solve / design / investigate / conduct complex engineering problems / products, processes and systems / issues / activities in the field of study.	Identify knowledge and understanding of mathematics as well as sciences and engineering disciplines underlying engineering specialisation necessary to solve / design / investigate / conduct complex engineering problems / products, processes and systems / issues / activities in the field of study.
2. Engineering Analysis	Demonstrate knowledge and understanding of the processes and established methods of analysis / solution of engineering issues (products, processes, systems, situations) / engineering problems in the field of study and of their limitations.	Analyse / solve complex engineering issues (products, processes, systems, situations) / engineering problems in the field of study by applying appropriate and relevant established methods of analysis / solution.	Identify appropriate and relevant established methods of analysis / solution of complex engineering issues (products, processes, systems, situations) / engineering problems in the field of study.
3. Engineering Design	Demonstrate knowledge and understanding of the process and established methods of design in the field of study and of their limitations.	Design complex engineering products (devices, artefacts, etc.), processes and systems in the field of study by applying appropriate and relevant established design methods.	Identify appropriate and relevant established design methods of complex engineering products (devices, artefacts, etc.), processes and system in the field of study.
4. Investigations	Demonstrate knowledge and understanding of codes of practice and safety regulations and of investigation methods (consultation of sources of information, simulations, experimental methods) in the field of study and of their limitations.	Consult and apply codes of practice and safety regulations and conduct investigations (consultation of sources of information, simulations, experimental methods) in the field of study in order to meet specified needs and report the investigation results.	Identify appropriate and relevant investigation approaches (among codes of practice and safety regulations, consultation of sources of information, simulations, experimental methods) in the field of study and analyse, explain and interpret the investigation results with respect to the needs to be met.

5. Engineering Practice	Demonstrate practical knowledge and understanding of materials, equipment and tools, processes and technologies in the field of study and of their limitations.	Conduct complex engineering activities in the field of study, using and applying practical knowledge and understanding of materials, equipment and tools, processes and technologies.	Identify practical knowledge and understanding of materials, equipment and tools, processes and technologies necessary to conduct complex engineering activities in the field of study.
6. Making Judgments	Demonstrate awareness of the key aspects of professional, ethical and social responsibilities linked to management of engineering activities, decision making and judgment formulation.	Manage work contexts in the field of study, take decisions and formulate judgments.	Identify appropriate and relevant approaches to manage work contexts in the field of study and reflect on professional, ethical and social responsibilities in taking decisions and formulating judgments.
7. Team-working	Demonstrate knowledge and understanding of functioning methods of teams that may be composed of different disciplines and levels.	Function effectively in national and international contexts as member of teams that may be composed of different disciplines and levels contributing to meet deliverable, schedule and budget requirements.	Identify appropriate functioning methods and relevant management strategies of teams that may be composed of different disciplines and levels and elements of successful teamwork.
8. Communication	Demonstrate knowledge and understanding of established communication methods and tools and of their limitations.	Communicate effectively, clearly and unambiguously information, describe activities and communicate their exits/results to engineers or wider audiences in national and international contexts, using appropriate established communication methods and tools.	Identify appropriate and relevant established communication methods and tools.
9. Lifelong Learning	Demonstrate knowledge and understanding of the learning methods necessary to follow developments in science and technology in the field of study.	Engage in independent lifelong learning and follow developments in science and technology in the field of study autonomously.	Identify appropriate learning methods in independent lifelong learning to follow developments in science and technology in the field of study.

*** Complex engineering problems / products, processes and systems / issues / activities**

Problems / products, processes, systems / issues / activities that cannot be solved / designed / investigated / conducted without:

- knowledge and understanding of mathematics, sciences and engineering disciplines underlying engineering specialisation, and/or
- knowledge and understanding that support solving of engineering problems, designing of engineering products, processes and systems, investigation of engineering issues, conducting of engineering activities and/or

- knowledge and understanding of engineering practice.

Learning Areas	Programme Learning Descriptors for Engineering Master Degree Programmes		
	Content in Knowledge and Understanding	**Content in Skills**	**Content in Autonomy and Responsibility**
1. Knowledge and Understanding	Demonstrate in-depth knowledge and understanding of mathematics as well as sciences and engineering disciplines underlying specialisation at a level necessary to achieve the other programme outcomes.	Apply knowledge and understanding of mathematics as well as sciences and engineering disciplines underlying specialisation to solve / design / investigate / conduct very complex engineering problems / products, processes and systems / issues / activities in the field of study.	Identify and justify knowledge and understanding of mathematics as well as sciences and engineering disciplines underlying specialisation necessary to solve / design / investigate / conduct very complex engineering problems / products, processes and systems / issues / activities in the field of study.
2. Engineering Analysis	Demonstrate comprehensive knowledge and understanding of the processes and methods of analysis / solution of engineering issues (products, processes, systems, situations) / engineering problems in the field of study, including new and innovative methods, and of their limitations.	Analyse / solve very complex engineering issues (products, processes, systems, situations) / engineering problems in the field of study by applying appropriate and relevant methods of analysis / solution.	Identify and justify appropriate and relevant methods of analysis / solution of very complex engineering issues (products, processes, systems, situations) / engineering problems in the field of study from established or new and innovative methods.
3. Engineering Design	Demonstrate comprehensive knowledge and understanding of the process and methods of design in the field of study, including new and original methods, and of their limitations.	Conceive and design very complex engineering products (devices, artefacts, etc.), processes and systems in the field of study by applying appropriate and relevant design methods.	Identify and justify appropriate and relevant design methods of very complex engineering products (devices, artefacts, etc.), processes and systems in the field of study from established or new and innovative methods.
4. Investigations	Demonstrate comprehensive knowledge and understanding of codes of practice and safety regulations and of investigation methods (consultation of sources of information, simulations, experimental methods) in the field of study, including new and original emerging	Consult and apply codes of practice and safety regulations and conduct investigations (consultation of sources of information, simulations, experimental methods) in the field of study and within broader or multidisciplinary contexts in order to meet specified needs and report the investigation results.	Identify and justify appropriate and relevant investigation approaches (among codes of practice and safety regulations, consultation of sources of information, simulations, experimental methods) in the field of study and within broader or multidisciplinary contexts, and analyse, explain and critically

	methods, and of their limitations.		evaluate the investigation results with respect to the needs to be met.
5. Engineering Practice	Demonstrate comprehensive practical knowledge and understanding of materials, equipment and tools, processes and technologies in the field of study and of their limitations.	Implement and conduct complex engineering activities in the field of study and within broader or multidisciplinary contexts, using and applying practical knowledge and understanding of materials, equipment and tools, processes and technologies.	Identify and justify practical knowledge and understanding of materials, equipment and tools, processes and technologies necessary to conduct complex engineering activities in the field of study and within broader or multidisciplinary contexts.
6. Making Judgments	Demonstrate critical awareness of the key aspects of professional, ethical and social responsibilities linked to management of work contexts, decision making and judgment in the field of study.	Manage work contexts in the field of study and within broader or multidisciplinary contexts that may be unpredictable and require new strategic approaches, take decisions and formulate judgments.	Identify and justify appropriate and relevant strategic approaches and analyse professional, ethical and social responsibilities linked to the management of work contexts in the field of study and within broader or multidisciplinary contexts, taking coherent decisions and formulating coherent judgments.
7. Team-working	Demonstrate knowledge and understanding of functioning methods and management strategies of teams that may be composed of different disciplines and levels and awareness of leadership responsibilities.	Function effectively in national and international contexts as member/leader of teams that may be composed of different disciplines and levels meeting deliverable, schedule and budget requirements.	Identify and justify appropriate and relevant functioning methods and management strategies of teams that may be composed of different disciplines and levels and elements of successful teamwork.
8. Communication	Demonstrate knowledge and understanding of communication strategies, methods and tools, including new and innovative ones, and of their limitations.	Communicate effectively, clearly and unambiguously information, describe activities and communicate their exits/results – and the knowledge and rationale underpinning these – to specialist and non-specialist audiences in national and international contexts and society at large, using appropriate communication strategies, methods and tools.	Identify and justify appropriate and relevant communication strategies, methods and tools from established or new and innovative ones.
9. Lifelong Learning	Demonstrate knowledge and understanding of the	Engage in independent lifelong learning and follow	Identify and justify appropriate learning

	learning methods necessary to follow developments in science and technology and undertake further studies in new and emerging technologies in the field of study and within broader or multidisciplinary contexts.	developments in science and technology and undertake further studies in new and emerging technologies in the field of study and within broader or multidisciplinary contexts autonomously.	strategies and methods in independent lifelong learning to follow developments in science and technology and undertake further studies in new and emerging technologies in the field of study and within broader or multidisciplinary contexts.

*** Very complex engineering problems / products, processes and systems / issues / activities**

Problems / products, processes and systems / issues / activities that cannot be solved / designed / investigated / conducted without:

- knowledge and understanding of mathematics, sciences and engineering disciplines underlying engineering specialisation, and/or
- knowledge and understanding that support solving of engineering problems, designing of engineering products, processes and systems, investigation of engineering issues, conducting engineering activities and/or
- knowledge and understanding of engineering practice,

and that may be unfamiliar or new, involve considerations from outside the field of study, incompletely defined and /or conflicting issues and non-technical constraints, and require original/innovative thinking.

Annex 2 – Standards and Guidelines for Quality Assurance of Engineering Study Programmes

Standard A - Programme Aims

The engineering study programme should identify the educational needs of the labour market of reference and other stakeholders, establish programme educational objectives coherent with the mission of the institution the study programme belongs to and the identified educational needs, and programme learning outcomes coherent with the established programme educational objectives.

Quality Requirement A1 - Educational needs of the labour market and other stakeholders

The engineering study programme should identify the educational needs of the labour market of reference and other stakeholders.

Expected Activities

The ESP should identify the educational needs of all its stakeholders and in particular those of the labour market of reference.
The educational needs should be identified in a way appropriate for the definition of the programme educational objectives and of the programme learning outcomes. To this end, the educational needs should be identified in terms of functions expected for the graduates in the first years of their placement in the labour market and/or required competences.

In order to identify the educational needs of the labour market, first of all the ESP should identify the organisations representative of the production, services and professions world and/or employers to be consulted.
The educational needs of the labour market of reference may be identified in many ways. They may be:

- mentioned in documents, studies, labour market analysis of the external stakeholders (Ministries, organisations representative of the production, services and professions world, etc.);
- identified through direct contacts with organisations representative of the production, services and professions world and/or employers (e.g. through meetings of working groups composed by representatives from University and from the labour market of reference, surveys by questionnaires, interviews, focus groups, etc.);
- identified through the relationships with organisations for carrying out training periods outside the University (in companies, etc.) by students;
- identified through the results of the graduates' placement in the labour market.

The ESP should indicate how the educational needs of the labour market of reference and other stakeholders are identified, i.e. the consultations method/s and schedules (e.g.: annual periodicity, at established terms, etc.).

All these information should be properly documented.

Required Documentation

Organisations/employers and other stakeholders consulted and Methods and schedule of consultation

List the organisations representative of the production, services and professions world and/or the employers and the other stakeholders consulted in order to identify their educational needs.
List the consultations method/s and schedules.
Provide only information properly documented.

Identified educational needs of the labour market and other stakeholders

List the identified educational needs of the labour market of reference of the other stakeholders and make available the document where they are registered.

Quality Requirement A2 - Programme educational objectives

The engineering study programme should define programme educational objectives consistent with the mission of the institution the study programme belongs to and the identified educational needs.

Expected Activities

The programme educational objectives are the main programme aims of any study programme.
The ESP should establish the programme educational objectives in terms of professional profiles of the graduates, i.e. of functions graduates are to be prepared for and/or subject-related and generic (transversal) ~~key~~ competences to be developed and obtained by graduates. The established programme educational objectives should be consistent with the mission of the institution the ESP belongs to and the identified educational needs.
Furthermore, the ESP should indicate the main areas in which graduates can be employed, giving indications about the level of responsibility they will be qualified to take.
The first cycle study programmes should also indicate the second cycle ESPs where graduates can continue their studies.
All these information should be properly documented.

Required Documentation

Programme educational objectives

List the established programme educational objectives.
List the main areas in which graduates can find employment and the level of responsibility they are qualified to take.
For first cycle programmes indicate also the second cycle ESPs in which the first cycle graduates can continue their studies.
Provide only information properly documented.

Quality Requirement A3 - Programme learning outcomes

The engineering study programme should define programme learning outcomes, in terms of what students are expected to know, understand and/or be able to demonstrate after completion of the educational process, consistent with the national qualification framework, if any, the established programme educational objectives and the programme learning descriptors for ESPs.

Expected Activities

The ESP should establish programme learning outcomes in terms of what a student is expected to know, understand and/or be able to demonstrate after completion of the learning process.
The learning outcomes should be adequate to the reference cycle (I or II) of the ESP[3] and consistent with the national qualification framework, if any, and with the established programme educational objectives.
Furthermore, they should be S.M.A.R.T.: Specific (they should adequately reflect the context, level, scope and content of the programme), Measurable (they should be properly detailed in order to favour the understanding of the depth and extent of expected learning and objectively assessable in terms of what the student has actually achieved at the end of the programme), Achievable (consistent with the institutional context and the available resources), Relevant (only the learning outcomes necessary to fulfil the programme educational objectives should be established at programme level), Time-related (plannable and achievable within the specified workload).
The programme learning outcomes should be properly documented.

For the purpose of EUR-ACE accreditation, the expected programme learning outcomes must be consistent with the programme learning descriptors for ESPs.

Required Documentation

[3] With reference to Dublin descriptors [4] and EQF for LLL [7].

Programme learning outcomes

List the programme learning outcomes.
Provide only information properly documented.

Coherence with the programme learning descriptors for ESPs

Document the coherence of the programme learning outcomes with the programme learning descriptors for ESPs, providing evidence of the programme learning outcomes corresponding to each programme learning descriptor.
To this end, the table shown in Annex A3.a can be used.

Alternatively

Document the coherence of the ESP curriculum with the programme learning descriptors for ESPs, providing evidence of the course units that contributes to the fulfilment of each programme learning descriptor.
To this end, the table shown in Annex 3.b can be used.

Standard B - Educational process

The engineering study programme should assure students educational activities consistent with the national standards, if any, and able to achieve the established programme learning outcomes through contents, methods, workload and times adequately designed and planned, promote a student-centred teaching and learning approach, assure a correct assessment of students' learning through suitable assessment methods and criteria. The engineering study programme should also define appropriate rules covering student admission, recognition, progression and attestation and keep under control the development of the educational process.

Quality Requirement B1 - Design of the educational process

The engineering study programme should design a curriculum and characteristics of the course units and of the graduation exam consistent with the national standards, if any, and the established programme learning outcomes. The curriculum should embed a student-centred teaching and learning approach.
The engineering study programme should also define assessment methods and criteria able to ensure a correct assessment of the students' learning.

Expected Activities

The ESP should establish a curriculum and characteristics of the course units consistent with the national standards, if any, and able to allow all students to achieve the established programme learning outcomes within the official duration of the ESP, according to a gradual process and through coherent and coordinated educational activities.
The curriculum should indicate at least the list of the course units, their sequence (year and semester of delivery), the number of ECTS credits[4] allocated to each unit and the unit lecturer.
The curriculum should embed a student-centred teaching and learning approach. In particular, it should enable flexible learning paths and encourage students to take an active role in co-creating the learning process.
The curriculum should be approved by another body besides the one composed by the only teaching staff of the ESP and should be properly documented.

For each course unit the ESP should define at least:

- name;
- number of ECTS credits[3];
- course year and teaching period of delivery;

[4] If the SP uses a national system of credits, indicate the number of national credits and the equivalence with the ECTS credits.

- learning outcomes specific of the course unit and consistent with the established programme learning outcomes;
- contents (and schedule);
- teaching and learning methods (face to face education, paper-based distance education, ICT-based distance education), also in terms of hours/credits for each form, and typologies of educational activities or teaching techniques (e.g.: lectures, practical classes, project classes, laboratory sessions, seminars, etc.), also in terms of number of hours/credits for each technique;
- assessment methods (e.g.: written examinations, oral examinations, etc.) and assessment criteria (descriptions of what the learner is expected to do and to what level, in order to demonstrate that learning outcomes specific of the course units have been achieved and to what extent); criteria for measuring students' learning or assessment metrics (e.g.: attribution of a final grade, fitness declaration, etc.) and criteria of attribution of the final grade, if any;
- preparatory course units, if any;
- educational material of reference (e.g.: textbooks, lecture texts, etc.).

The assessment methods and criteria should provide clear evidence of their capacity to check the effective achievement of the learning outcomes specific of the course units by the students and ensure trust that the level of achievement by the students is correctly assessed.
The definition of the characteristics of the course units should be coordinated by the ESP, particularly in order to avoid gaps or superimpositions in the definition of the specific learning outcomes and contents and to assure the suitability of the assessment methods to a correct assessment of the students' learning. The ESP should establish how to manage the coordination activity.

As for the graduation exam, the ESP should define at least:

- workload, in terms of ECTS credits[3]/hours;
- requirements to be fulfilled by the final work or thesis;
- carrying out of the graduation exam;
- criteria for the attribution of the graduation grade.

The characteristics of the course units and of the graduation exam should be properly documented.

The ESP should document the suitability of the curriculum to the achievement of the expected programme learning outcomes, by at least pointing out the course units (thesis work included) which contribute to the accomplishment of each programme learning outcome.

Required Documentation

Curriculum

Describe synthetically the structure and the characteristics of the curriculum and provide the curriculum with at least the list of the course units, their sequence (year and semester of delivery), the number of ECTS credits[11] associated at each unit and the unit lecturer. Indicate also the body/ies that approve the curriculum.
Provide only information properly documented.

Characteristics of the course units

Describe how the ESP coordinates the definition of the characteristics of the course units and make available the forms which describe the characteristics of the course units.
Provide only information properly documented.

Characteristics of the graduation examination

Describes the characteristics of the graduation examination.
Provide only information properly documented.

Suitability of the curriculum to the achievement of the programme learning outcomes

Document the suitability of the curriculum to the achievement of the expected programme learning outcomes.

Quality Requirement B2 - Admission, recognition, progression and attestation

The engineering study programme should establish rules covering all phases of the student 'life cycle', and in particular student admission, recognition, progression and attestation.

Expected Activities

The ESP should establish the qualifications required for admission to the ESP and the admission requirements, in terms of knowledge and/or understanding and/or capacities required for a profitable participation of the students in the established educational activities, in particular of the first course year.
The ESP should organize possible activities in order to promote the possession of the admission requirements by the students and establish the methods of assessment of their possession by the students.
The ESP should also specify the required level of possession of the admission requirements and the criteria for the selection of the students to be admitted when the number of applications is larger than the number of students who can be enrolled.

The ESP should establish rules for the recognition of higher education qualifications, periods of study and prior learning, including the recognition of non-formal and informal learning.

The ESP should also establish management criteria of the students' career able to favour a regular students' progression in their studies. These criteria should regard at least:

- frequency of the educational activities;
- number of ECTS credits[4] necessary for the enrolment in the successive course year;
- number of ECTS credits[4] to be accumulated before the holding of training periods.

Furthermore, the ESP should establish appropriate rules to regulate the studies progression of at least:

- part time students;
- working students,
- handicapped students;
- students who cannot attend the educational activities for a long period for causes independent from their will (e.g.: in case of illness, etc.).

Finally, after the completion of the studies, the ESP should provide the graduates with a document ('Diploma Supplement') explaining the qualification gained, including the achieved programme learning outcomes and the context, level, content and status of the pursued and successfully completed studies.

All these information should be properly documented.

Required Documentation

Admission

Provide the required qualifications and the established requirements and criteria for the admission to the ESP, the methods of assessment of the possession of the admission requirements by students.
Provide only information properly documented.

Recognition

Provide the rules established for the recognition of higher education qualifications, periods of study and prior learning.
Provide only information properly documented.

Progression

Provide the established management criteria of the students' progression in their studies.
Provide only information registered in official documents.

Attestation

Make available the documentation provided to graduates after the completion of their studies.
Provide only information properly documented.

Quality Requirement B3 - Planning of the educational process

The engineering study programme should plan the development of the educational process in order to enable students to achieve the programme learning outcomes in the expected time, according to a gradual process and through coherent and coordinated educational activities.

Expected Activities

The ESP should define:

- calendar and timetable of the course units,
- calendar of the examinations, graduation examination included, and composition of the examination commissions.

The planning of the educational activities should provide students with adequate time for individual study and facilitate their studies progression.
All these information should be approved by the ESP.

Required Documentation

Calendar and timetable of course units and examinations

Make available the:

- calendar and timetable of the course units,
- calendar of the examinations, graduation examination included, and composition of the examination commissions.

Provide only information approved by the ESP.

Quality Requirement B4 - Management of the educational process

The engineering study programme should manage the educational process coherently with the designed and planned development and keep under control its development, in order to resolve any urgent and immediate problem and to check the adequacy of the assessment tests and of the final work/thesis to the achievement of the established learning outcomes specific of the course units and the correctness of the evaluation of the students' learning.

Expected Activities

The ESP should realise the educational process coherently with the designed and planned development. To this end, the ESP should keep under control its development, also in order to resolve any urgent and immediate problem.
The correspondence of the development of the educational process with the designed and planned development can be controlled in different ways, 'direct' (e.g.: direct control of the observance of the lecture timetable by the lecturers, etc.) and/or 'indirect' (e.g.: through the control of the lecture registers, through the survey of the students' feedback on the course units, etc.).
The ESP should establish how to keep under control the development of the educational process. Both the adopted methods and the results of the control should be properly documented.

The ESP should keep under control also the assessment tests and the final work/thesis, in order to check their adequacy to the assessment of the achievement of the learning outcomes specific of the course units and of the final work/thesis by students and the correctness of the evaluation of the students' learning.
The adequacy of the assessment tests could be controlled in different ways, 'direct' (e.g.: the ex-ante control of the examination tests or questions, the direct control of the oral tests, the ex-post control of the written tests, etc.) and/or 'indirect' (e.g.: through the monitoring of the results of the assessment tests, through the survey of the average final grade and of the grade variation for each course unit which requires the attribution

of a final grade, etc.). The adequacy of the final work/thesis can be easily kept under control by monitoring the topics and content of the final works/theses.
The ESP should establish how to keep under control the adequacy of the assessment tests and of the final work/thesis. Both the adopted methods and the results of the control should be properly documented.

Required Documentation

Control of the development of the educational process

Describe how the ESP keeps under control the development of the educational process, in order to check its correspondence with the designed and planned development, and resolves the urgent and immediate problems, and document the results of the control at least for the last academic year.

Control of the assessment tests and of the final work/thesis

Describe how the ESP keeps under control the assessment tests and the final work/thesis, in order to check their adequacy to the assessment of the achievement of the learning outcomes specific of the course units and of the final work/thesis by students and the correctness of the evaluation of the students' learning, and document the results of the control at least for the last academic year.

Standard C - Resources

The study programme should have at disposal teaching staff, facilities, financial resources, student support services and partnerships adequate to the achievement of the learning outcomes and able to make easier the students' progression in their studies.

Quality Requirement C1 - Teaching staff

The engineering study programme should have at disposal teaching staff, including teaching support staff, quantitatively and qualitatively adequate for the achievement of the established learning outcomes by students. The teaching staff should be appointed according to pre-definite criteria of recruiting/selection/choice and the programme should offer the teaching staff the opportunity to improve their teaching skills and the use of new technologies.

Expected Activities

The ESP should identify and make available teaching staff (staff in charge of the course units) and teaching support staff (staff in charge of teaching activities – certain parts of the course units, exercises, laboratory activities, etc. - in collaboration with or in support of the teaching staff) quantitatively (e.g. with reference to the number of students) and qualitatively (e.g. with reference to their qualification, competence and scientific interests) adequate for the achievement of the learning outcomes by students.
The teaching staff and teaching support staff should be appointed according to pre-definite criteria of recruiting/selection/choice. The ESP should establish the recruiting/selection/choice or selection. This information should be properly documented.
The ESP should gather and update all the information necessary to provide evidence of the adequacy of the available teaching staff [in particular: concerning academicians, academic qualification and CV, including information on research activities carried out and papers published in the last x (e.g. 5) years; concerning professionals, professional works and/or activities carried out in the last x (e.g. 5) years] and teaching support staff [in particular: qualification, total number of hours of didactic workload, duties (e.g.: practical training, lab assistance, etc.)].

Furthermore, the teaching staff should have appropriate didactic skills. In this regard, the ESP should offer the teaching staff the opportunity to improve their teaching skills, also in using of new technologies, and to achieve acceptable standards.

Required Documentation

Teaching staff

List the ESP teaching staff and provide at least the following information for each lecturer:

- academic or professional qualification;
- list of the ESP course units he/she is in charge of.

Document the recruiting/selection/choice criteria for appointment of the teaching staff. Provide only information properly documented.

Make available the CV of each lecturer, with the description of the scientific and/or professional interests, activities and results.

Provide the information about the opportunities offered to the teaching staff for improving their teaching skills and the use of new technologies and achieving acceptable standards.

Teaching support staff

For each course unit which utilises support teachers, make available the list of the support teachers and provide at least the following information for each of them:

- qualification;
- total number of hours of didactic workload;
- duties (e.g.: practical training, lab assistance, etc.).

Document the recruiting/selection/choice criteria for appointment of the teaching support staff.

Provide only information properly documented.

Quality Requirement C2 - Facilities and support staff

The engineering study programme should have at disposal facilities (lecture and study rooms, laboratories, libraries), with the associated equipment, and technical-administrative staff quantitatively and qualitatively adequate for the development of the established educational activities as designed and planned and able to allow the application of the established educational methods.

Expected Activities

The ESP should identify and make available facilities (in particular: lecture and study rooms, laboratories, libraries) quantitatively (e.g. with reference to the number of enrolled students) and qualitatively (e.g. with reference to logistics, habitableness, availability of audiovisual equipment, availability of web connection as for the lecture and study rooms; laboratory activities established in the curriculum as for the laboratories; needs of documentation by the students as for the libraries) adequate to the development of the educational activities according to what designed and planned and to actuate the established educational methods. Also the available technical-administrative staff in charge of the management of the facilities should be quantitatively and qualitatively adequate.

The ESP should gather and update all the information necessary to provide evidence of the adequacy of the available facilities [in particular: concerning lecture rooms, number of seats, availability of audio-visual equipment, availability of web connection, availability of surveillance and assistance staff; concerning study rooms, number of seats, availability of web connections, opening time and access rules, availability of surveillance and assistance staff; concerning laboratories and PC rooms, availability of equipment or personal computers and software of interest for the educational activities of the ESP, number of workplaces and number of students for workplace, availability of technical staff; concerning libraries, available bibliographical material of interest for the educational activities of the ESP, availability of web connections, services offered (consultation of books and journals, book rent, bibliographical researches, access to data bases, etc.), opening time and access rules, availability of librarian staff] and of the technical-administrative staff (in particular: qualification and duties).

Of course, the ESP may have at disposal other resources (ICT services, transports, canteens, student accommodations, sports facilities, etc.) and the ESP or the structure it belongs to may undertake special initiatives (cultural initiatives, recreational activities, etc.) useful to the effectiveness of the educational process.

Required Documentation

Lecture rooms

List the lecture rooms utilised by the ESP and provide at least the following information for each of them:

- number of seats;
- supply of audio-visual equipment;
- availability of web connection;
- surveillance/assistance staff, their qualification and duties.

Study rooms

List the rooms for individual studies utilised by the students and provide at least the following information for each of them:

- number of seats;
- availability of web connections;
- opening time and access rules;
- surveillance/assistance staff, their qualification and duties.

Laboratories

List the laboratories (PC rooms included) utilised by the ESP and provide at least the following information for each of them:

- equipment and/or personal computers and software of interest for the educational activities of the ESP available;
- number of workplaces and number of students for workplace;
- access rules;
- technical staff, their qualification and duties.

Libraries

List the libraries utilised by the students of the ESP and provide at least the following information for each of them:

- availability of updated bibliographical material of interest for the educational activities of the ESP;
- availability of web connections;
- services offered (consultation of books and journals, book rent, bibliographical researches, access to data bases, etc.);
- opening time and access rules;
- librarian staff, their qualification and duties.

Other resources and special initiatives

List other resources at disposal of the ESP and special initiatives undertaken by the ESP or the structure it belongs to.

Quality Requirement C3 - Financial resources

The engineering study programme should have at disposal financial resources adequate for the development of the educational process according to the designed and planned activities.

Expected Activities

The ESP should define the needs of financial resources through the identification of the expense needs (e.g.: remuneration of contract teachers; remuneration of support teachers; updating of the laboratory equipment; maintenance of the laboratories; educational material to be distributed to students; etc.) and the amount of the relative expenses.

Then the ESP should make available the financial resources necessary to the realization of the educational process.

All this information should be properly documented.

Required Documentation

Needs of financial resources

Document the needs of financial resources, subdivided according to the expense typologies.
Provide only information properly documented.

Availability of financial resources

Document the availability of financial resources and indicate at least:

- financing bodies;
- amount of the financial resources put at disposal;
- subdivision of the available financial resources according to the expense typologies.

Provide only information properly documented.

Quality Requirement C4 - Student support services

The engineering study programme should have at disposal student support (orienteering, tutoring and assistance) services relevant to the educational process and able to make easier students' learning and progression in their studies.

Expected Activities

The students of the ESP should have at their disposal the following services at least:

- student administrative office, whose main responsibility should be the management of the students' career, issue of the Diploma Supplement included;
- orienteering service for incoming students, whose main responsibilities should be to favour a correct knowledge of the educational objectives and of the characteristics of the ESP and to orient students in order to favour an aware choice of the ESP;
- tutoring service, whose main responsibilities should be to favour an effective insertion in the educational process of the ESP and an effective students' progression in their studies;
- service for carrying out training periods outside University, whose main responsibilities should be the organisation and the management of training periods at national and/or international public and/or private bodies;
- international mobility service, whose main responsibilities should be the organisation and the management of the international mobility of students in exit at and in entrance;
- job placement service, whose main responsibility should be to favour the placement of the graduates in the labour market.

The ESP should gather, update and make available all the information useful to provide evidence of the adequacy of the available services and of the administrative staff.

Required Documentation

Student administrative office

Make available the following information at least:

- office organisation and management;
- activities in charge of the office;
- administrative staff, their qualification and duties;
- activities and results of the last academic year at least.

Orienteering service for incoming students

Make available the following information at least:
- service organisation and management;
- activities in charge of the service;
- administrative staff, their qualification and duties;
- activities and results of the last academic year at least.

Tutoring service

Make available the following information at least:
- service organisation and management;
- activities in charge of the service;
- administrative staff, their qualification and duties;
- activities and results of the last academic year at least.

Service for carrying out training periods outside University

Make available the following information at least:
- service organisation and management;
- activities in charge of the service;
- administrative staff, their qualification and duties;
- activities and results of the last academic year at least.

International mobility service

Make available the following information at least:
- service organisation and management;
- activities in charge of the service;
- administrative staff, their qualification and duties;
- activities and results of the last academic year at least.

Job placement service

Make available the following information at least:
- service organisation and management;
- activities in charge of the service;
- administrative staff, their qualification and duties;
- activities and results of the last academic year at least.

Quality Requirement C5 - Partnerships

The engineering study programme should have partnerships with national and/or international businesses, research institutions and other Higher Education Institutions quantitatively and qualitatively adequate for carrying out students' external education and international mobility.

Expected Activities

The ESP should establish partnerships with national and/or international public and/or private bodies for carrying out training periods outside University (training periods, carrying out the final work, etc.) adequate to the achievement of the intended learning outcomes.

The ESP should establish partnerships with other national and/or international HEIs for the students' mobility (carrying out of periods of education abroad, awarding of joint degrees, etc.) adequate to the achievement of the intended learning outcomes.

Required Documentation

Partnerships for carrying out training periods outside University

Make available the list of the active partnerships for carrying out training periods outside the University and for each partnership the number of students who have carried out training periods in the body in consideration in the last three academic or solar years at least.
To this aim, the table of Annex C5.1 can be used.

Partnerships for carrying out international mobility periods

Make available the list of the active partnerships for carrying out students' international mobility periods and for each partnership the number of students, in exit and in entrance, who have carried out periods of mobility in the Institution in consideration in the last three academic or solar years at least.
To this aim, the table of Annex C5.2 can be used.

Standard D - Monitoring

The engineering study programme should monitor the results of the educational process, at least with respect to incoming students, students' progression in their studies, students' learning, graduates' placement, students' feedback on the educational process and employed graduates' and employers' feedback on the graduates' education, in order to check the adequacy and effectiveness of the educational service provided.

Quality Requirement D1 - Incoming students

The engineering study programme should monitor the incoming students in order to check its attractiveness.

Expected Activities

In order to check its attractiveness, the ESP should monitor the incoming students through the gathering of the results relative at least to the number of the incoming students enrolled in the first course year and, if available and useful to the assessment of the ESP attractiveness, their geographical and secondary school of provenance.
As for the school provenance, the information to be gathered should regard the typology of the school of provenance and the grade of the school-leaving examination.

Required Documentation

Enrolments in the first course year

Make available the data relative at least at the last three cohorts for which full surveys are available required by:

- Table D1_B for Bachelor Degree programmes;
- Table D1_M for the Master Degree programmes;

of Annex D1.

Quality Requirement D2 - Students' progression in their studies

The engineering study programme should monitor the students' progression in their studies in order to check the effectiveness of the educational process.

Expected Activities

In order to check the effectiveness of the educational process, the ESP should monitor the students' progression in their studies through at least the gathering of the following data at least:

- the number of students who pass from one course year to the successive one;
- the number of graduates within the official length of the ESP.

Required Documentation

Enrolments in the different course years

Make available the data relative at least at the last three cohorts for which full surveys are available required by:

- Table D2.1_B for Bachelor Degree programmes;

- Table D2.1_M for Master Degree programmes;

of Annex D2.

Graduation time

Make available the data relative at least at the last three cohorts for which full surveys are available required by:

- Table D2.2_B for Bachelor Degree programmes;
- Table D2.2_M for Masters Degree programmes;

of Annex D2.

Quality Requirement D3 - Students' learning

The engineering study programme should monitor the students' learning in order to check the effectiveness of the course units.

Expected Activities

In order to check the effectiveness of the course units, for each course unit the ESP should monitor the students' learning through the gathering of the following data at least:

- the number of students who have to take the examination in the academic year under consideration;
- the number of students who have passed the examination in the academic year under consideration;
- the average value of the grades attributed to all the students who have passed the examination;
- the grade variation.

The control of the results of the assessment tests makes also possible the indirect control of the adequacy of the tests to check the level of achievement of the learning outcomes specific of the single course unit and the correctness of the assessment of the students' learning by the lecturers. At this regard direct and more adequate monitoring are the ex-ante control of the examination tests, the control of the development of the assessment tests, the ex-post control of the written tests, etc..

Required Documentation

Students' learning

Make available the data relative at least at the last three cohorts for which full surveys are available required by Table D3 of Annex D3.

Quality Requirement D4 - Students' feedback on the educational process

The engineering study programme should monitor the students' feedback on the educational process in order to check the perceived adequacy and effectiveness.

Expected Activities

In order to check the perceived adequacy and effectiveness of the educational process, the ESP should monitor at least the students' feedback on:

- the course units;
- the training periods outside the University;
- the periods of mobility;

and the final year students' feedback on the educational process and on the student support services.

The monitoring of the students' feedback should at least consider the list of questions reported in the document *QUACING Questionnaires for monitoring of perceived quality.*

Other monitoring can regard the survey of the incoming students' feedback on the orienteering service for incoming students.

For each monitoring the ESP should define the monitoring instrument (e.g.: on-line questionnaires, paper questionnaires, interviews, etc.) and schedule (e.g.: before the end of the lessons, during the examination period, etc.) and gather the monitoring results. In particular, the information and data gathered through the monitoring of the students' feedback on the course units should be aggregated with reference to both the

single course unit and all the course units of the curriculum in order to monitor the perceived effectiveness of each single course unit and of the curriculum as a whole.

Required Documentation

Students' feedback on the course units

Describe the monitoring instrument and schedule of the students' feedback on the course units and make available the monitoring questionnaire and the results relative to both the single course units and all the course units of the curriculum at least for the last three cohorts for which full surveys are available.

Students' feedback on the training periods outside University

Describe the monitoring instrument and schedule of the students' feedback on the training periods outside University and make available the monitoring questionnaire and the results at least for the last three cohorts for which full surveys are available.

Students' feedback on the periods of international mobility

Describe the monitoring instrument and schedule of the students' feedback on the periods of international mobility and make available the monitoring questionnaire and the results at least for the last three cohorts for which full surveys are available.

Feedback of the final year students on educational process and support services

Describe the monitoring instrument and schedule of the final year students' feedback on the educational process and on the student support services and make available the monitoring questionnaire and the results at least for the last three cohorts for which full surveys are available.

Quality Requirement D5 - Graduates' placement

The engineering study programme should monitor the graduates' placement in order to check the demand of the granted qualification and the correspondence of the programme educational objectives and programme learning outcomes to the educational needs of the labour market.

Expected Activities

In order to check the demand of the granted qualification and the correspondence of the programme educational objectives and programme learning outcomes to the educational needs of the labour market, the ESP should monitor the graduates' placement in the labour market through the survey of the following data at least:

- the percentage of employed graduates;
- the placement time in the labour market;
- the effectiveness of the degree in the working activity (where for 'effectiveness' it is intended both the formal and substantial necessity of the degree in the working activity and the use of the acquired competences);

after 1÷3 years since graduation.

A list of questions for the monitoring of the graduates' placement in the labour market is suggested in the document *QUACING Questionnaires for monitoring of perceived quality.*

For this monitoring the ESP should define the monitoring instrument (e.g.: on-line questionnaires, paper questionnaires, interviews, etc.) and schedule and should gather the monitoring results.

Furthermore, the first cycle ESPs should gather the results relative to graduates who prosecute the studies in second cycle programmes and the second cycle ESPs should gather the results relative to graduates who prosecute the studies in PhD programmes after 1 year from their graduation.

Required Documentation

Graduates' job placement

Describe the monitoring instrument and schedule of the graduates' job placement and make available at least the following monitoring results:

- percentage of employed graduates;
- placement time in the labour market;
- effectiveness of the degree in the working activity

after 1÷3 years since graduation at least for the last three cohorts for which full surveys are available.

Prosecution of the studies in the second cycle programmes *(only for first cycle graduates)*

Make available the results relative to the first cycle graduates who prosecute their studies in second cycle ESPs after 1 year from the graduation at least for the last three cohorts for which full surveys are available.

Prosecution of the studies in PhD programmes *(only for second cycle graduates)*

Make available the results relative to the second cycle graduates who prosecute their studies in PhD programmes after 1 year from the graduation at least for the last three cohorts for which full surveys are available.

Quality Requirement D6 - Employed graduates' and employers' feedback on the graduates' education

The engineering study programme should monitor the employed graduates' and employers' feedback on the graduates' education in order to check the correspondence of the programme educational objectives and programme learning outcomes to the educational needs of the labour market.

Expected Activities

In order to check the correspondence of the programme educational objectives and programme learning outcomes to the educational needs of the labour market, the ESP should monitor the feedback of the employed graduates on the education received and of the employers on the graduates' education.

The ESP should monitor the feedback of the employed graduates on the education received at least once after 1÷5 years since graduation.
The monitoring of the employed graduates' feedback should at least consider the list of questions reported in the document *QUACING Questionnaires for monitoring of perceived quality.*
For this monitoring the ESP should define the monitoring instrument (e.g.: on-line questionnaires, paper questionnaires, interviews, focus groups, etc.) and periodicity (e.g.: annual, every three years, etc.) and should gather the monitoring results (also with reference to the number of graduates involved in the monitoring).

The ESP should also monitor the feedback of the employers on the education of the graduates at least every 3÷5 years.
The monitoring of the employers' feedback should at least consider the list of questions reported in the document *QUACING Questionnaires for monitoring of perceived quality.*
For this monitoring the ESP should define the monitoring instrument (e.g.: on-line questionnaires, paper questionnaires, interviews, focus groups, etc.) and periodicity (e.g.: every three years, etc.) and should gather the monitoring results (also with reference to the number of employers involved in the monitoring).

Required Documentation

Employed graduates' feedback on the education received

Describe the monitoring instrument and schedule of the employed graduates' feedback on the education received and make available the monitoring questionnaire and results (also with reference to the number of graduates involved in the monitoring) at least for the last three cohorts for which full surveys are available.

Employers' feedback on the graduates' education

Describe the monitoring instrument and schedule of the employers' feedback on the graduates' education and make available the monitoring questionnaire and results (also with reference to the number of employers involved in the monitoring).

Standard E - Management system

The institution the engineering study programme belongs to should have a public policy and appropriate processes and organization for the quality assurance of study programmes. The policy should be put into practice through the definition and adoption of a management system of the study programmes, able to assure their quality and the continual improvement of the effectiveness of the processes for the study programme management and of the associated results.

Quality Requirement E1 - Policy, processes and organization of the Higher Education Institution for the quality assurance of study programmes

The institution the engineering study programmes belongs to should have a public policy and appropriate processes and organization for the quality assurance of study programmes.

Expected Activities

The institution the ESP belongs to should pursue an adequate policy for the QA of ESPs, in order to realise its vision of the quality of its SPs[5] and to develop a quality culture.
The policy for the QA of ESPs should take into account both the national context in which the institution operates and the institutional context (in particular, its mission and its vision of the quality of SPs).
Such a policy should support:

- the organisation of the QA system of the ESPs. To this end, the policy should regard education provided (also with respect to the interrelation between education and development of the subject area and professional field of reference at national and international level, and the embedding of research in education), staff, facilities and student support services, monitoring of the results of the educational process, management system of the ESPs.
- The development of a quality culture, according to which institutional leadership, individual staff members and students take on their responsibilities in the QA of ESPs.
- The involvement of external stakeholders (alumni, representatives of the professional field) in the QA of ESPs.

In order to contribute to the accountability of the institution, the policy should have a formal status and be publicly available.

Furthermore, the institution the ESP belongs to should keep under control the implementation of its policy and the quality of its ESPs and pursue the improvement of the ESPs' quality wherever required by managing effective decision-making processes, thus contributing to the quality culture within the institution.
To this end, the institution should define an effective organisation for the QA of ESPs, which clearly defines responsibilities and duties.

The institution should also carry out the revision of its policy, processes and organization for the QA of ESPs according to an approved plan.

Required Documentation

Policy for quality assurance

Make available the document/s where mission, vision of the quality of SPs and policy for the QA of ESPs of the institution the ESP belongs to are registered.

Processes and organization for the quality assurance of ESPs

[5] The vision of the quality of SPs pertains to the institution's ambition regarding the quality of its SPs.

Describe the processes for the quality assurance of ESPs managed by the institution the ESP belongs to.
List the positions of responsibilities for the QA of ESPs of the institution the ESP belongs to and make available at least the following information for each position of responsibility identified:

- composition *(only in case of positions of responsibility composed by more people)*;
- duties.

For this purpose, the table of Annex E1.1 could be used.
Provide also the timetable for the revision of the policy, processes and organization for the QA of ESPs.
Provide only information properly documented.

Quality Requirement E2 - Management system of the study programme

The engineering study programme should implement an appropriate management system, through the identification of the quality assurance processes and the definition of a relevant organisational structure.

Expected Activities

The definition of a management system requires firstly the identification of the processes for the ESP management. They should include at least the QA processes considered fundamental by the QUACING Model. Furthermore, the processes composed by more sub-processes, whose management is in charge of different positions of responsibility (e.g.: a single person, a team of persons, a committee, a commission, etc.), should be subdivided in the component sub-processes up to the level at which it is possible to identify the positions of responsibility in charge of their management without ambiguities.

Then the definition of a management system requires the definition of an organisational structure, i.e. of the responsibilities for the management of the identified processes/sub-processes, able to assure their adequate management. To this end, the ESP should identify the position of responsibility (person, commission, committee, etc.) in charge of the management of each process/sub-process identified.

The ESP should also define the timescales for the implementation of the processes for its management.

Required Documentation

Management system of the study programme

List the processes for the ESP management and the responsibilities for their management.
For this purpose, a 'responsibility matrix' as the one proposed in Annex E2.1 could be used, with the indication for each identified process or sub-process of:

- the responsible of the process/sub-process;
- the position/s of responsibility collaborating in the process/sub-process management *(optional);*
- the document/s where the activities and/or the results of the process/sub-process under consideration are registered.

List the positions of responsibilities for the ESP management and make available at least the following information for each position of responsibility identified:

- composition *(only in case of positions of responsibility composed by more people)*;
- duties.

For this purpose, the table of Annex E2.2 could be used.

Provide also the timescales for the implementation of the processes for the ESP management.

Provide only information properly documented.

Quality Requirement E3 - Review

The engineering study programme should periodically review the processes for the study programme management and the associated results, in order to guarantee their constant adequacy and effectiveness or to promote the improvement of the effectiveness of the processes for the study programme management and of the associated results. Students and representatives of the labour market of reference should be involved in the review process.

Expected Activities

The review[6] is a periodic and scheduled process, finalised to the improvement of the ESP.
To this end the ESP should first of all define the management modalities of the review (in any case the review should involve the teaching staff, the enrolled students and the stakeholders of the labour market), its periodicity, the period of the academic year in which it should be carried out and the information and data to be taken into account, which should include at least:

- outcomes of the stakeholders' consultation,
- needs and availability of resources,
- results of the monitoring activities,

all information and data required by the QUACING Model.

The review must start with a self-assessment finalised to the identification of the strengths and weaknesses of the ESP, through at least the comparison of the ESP results with those obtained in the preceding years and the results obtained by other ESPs of the same typology, if available, and to the identification of the causes of the weak points (e.g.: causes of the dropouts, motivations of delays in graduation, etc.). The self-assessment may bring to the identification of needs of revision or redefinition of the programme educational objectives and process and of the QA system, and of opportunities of improvement of the management and/or of the results of single processes.
Then, for each identified need of revision and for each opportunity of improvement, the ESP should identify and adopt opportune improvement actions.
The results of the review should be documented in a Review Report.

Required Documentation

Management of the review process

Document the management modalities of the review process, its periodicity, the period of the academic year in which it should be carried out and the information and data taken into account.

Results of the review process

Make available the Review Report.
A check-list for the self-assessment coherent with the QUACING Model is shown in Annex E3.

Quality Requirement E4 - Publicly availability of information

The engineering study programme should make publicly available full, up to date, easily acquired information, both quantitative and qualitative, on study programme aims, educational process, resources and results.

Expected Activities

All the required documentation for the QA of the ESP should be made available on the web site of the ESP or of the structure the ESP belongs to.
In particular, at least information and data associated to Standard A, Standard B - Quality Requirements B1, B2 and B3, Standard C - Quality Requirements C1, C2, C4 and C5 should be available for all the stakeholders.

Required Documentation

Publicity of the documentation for the QA of the ESP

[6] The 'review' here considered does not take into account the reviews to be carried out in occasion of:

- changes in the national laws and norms and/or in the statute and by-laws of the structure the SP belongs to,
- resolutions of the structure the SP belongs to and/or of its own bodies,
- developments in the disciplines characterizing the SP,
- external assessment activities,

to be documented in specific 'review reports'.

Make available all the required documentation on the web site of the ESP or of the structure the ESP belongs to.

Annexes

Annex A3.a - Coherence of the programme learning outcomes with the PLDs

Programme Learning Descriptors	Corresponding programme learning outcomes
…	…

Annex A3.b - Course units that contribute to the fulfilment of the PLDs

Programme Learning Descriptors	Course units that contribute to the achievement of the PLDs
…	…

Annex C5.1 - Partnerships for carrying out training periods outside University

Partnerships for carrying out training periods outside University			
Organization / Institution	N. of students involved a.y. xx-3/xx-2	N. of students involved a.y. xx-2/xx-1	N. of students involved a.y. xx-1/xx
…	…	…	…

Annex C5.2 - Partnerships for carrying out international mobility periods

Partnerships for carrying out international mobility periods						
Institution	N. of students in exit a.y. xx-3/xx-2	N. of students in entrance a.y. xx-3/xx-2	N. of students in exit a.y. xx-2/xx-1	N. of students in entrance a.y. xx-2/xx-1	N. of students in exit a.y. xx-1/xx	N. of students in entrance a.y. xx-1/xx
…	…	…	…	…	…	…

Annex D1 - Results of the monitoring of incoming students

D1_B - Students enrolled in the first course year (Data available at …/…/…)

Students enrolled in the first course year	a.y. xx-3 / xx-2	a.y. xx-2 / xx-1	a.y. xx-1 / xx
New enrolments			
Provenance from other study programmes			
…			
Students enrolled in the first course year subdivided per geographical provenance *(if available and useful to the assessment of the ESP attractiveness)*	**a.y. xx-3 / xx-2**	**a.y. xx-2 / xx-1**	**a.y. xx-1 / xx**
Residents in the same town			
Residents in the same region			
…			
Foreign students			
Students enrolled in the first course year subdivided per school of provenance *(if available and useful to the*	**a.y. xx-3 / xx-2**	**a.y. xx-2 / xx-1**	**a.y. xx-1 / xx**

assessment of the ESP attractiveness)			
…			
…			
…			
Students enrolled in the first course year subdivided per grade of the school-leaving examination	**a.y. xx-3 / xx-2**	**a.y. xx-2 / xx-1**	**a.y. xx-1 / xx**
N. of students with grade of the school-leaving examination between … and …			
…			
N. of students with grade of the school-leaving examination > …			

D1_M - Students enrolled in the first course year (Data available at …/…/…)

Students enrolled in the first course year	**a.y. xx-3 / xx-2**	**a.y. xx-2 / xx-1**	**a.y. xx-1 / xx**
New enrolments			
Provenance from other study programmes			
…			
Students enrolled in the first course year subdivided per geographical provenance	**a.y. xx-3 / xx-2**	**a.y. xx-2 / xx-1**	**a.y. xx-1 / xx**
Residents in the same town			
Residents in the same region			
…			
Foreign students			
Students enrolled in the first course year subdivided per first cycle programme of provenance *(if available and useful to the assessment of the ESP attractiveness)*	**a.y. xx-3 / xx-2**	**a.y. xx-2 / xx-1**	**a.y. xx-1 / xx**
…			
…			
…			
…			
Students enrolled in the first course year subdivided per graduation grade *(if available and useful to the assessment of the ESP attractiveness)*	**a.y. xx-3 / xx-2**	**a.y. xx-2 / xx-1**	**a.y. xx-1 / xx**
…			
…			
…			
…			

Annex D2 - Results of the students' progression in their studies

D2.1_B - Enrolments in the different course years (Data available at …/…/…)

	a.y. xx-3 / xx-2	**a.y. xx-2 / xx-1**	**a.y. xx-1 / xx**
N. of students enrolled in the 1st course year			
Students enrolled in the 2nd course year holding to the reference cohort*			
Total number of students enrolled in the 2nd course year			
Students enrolled in the 3rd course year holding to the reference cohort			
Total number of students enrolled in the 3rd course year			
Students enrolled in the 4th course year holding to the reference cohort			
Total number of students enrolled in the 4th course year			
Out-of-course students holding to the reference cohort**			
Total number of out-of-course students			

* Cohort: whole of the students enrolled in the first course year in the academic year of reference.

** Students who have failed to complete their course in the prescribed time.

D2.1_M - Enrolments in the different course years (Data available at …/…/…)

	a.y. xx-3 / xx-2	a.y. xx-2 / xx-1	a.y. xx-1 / xx
N. of students enrolled in the 1st course year			
Students enrolled in the 2nd course year holding to the reference cohort*			
Total number of students enrolled in the 2nd course year			
Out-of-course students holding to the reference cohort**			
Total number of out-of-course students			

* Cohort: whole of the students enrolled in the first course year in the academic year of reference.
** University students who have failed to complete their course in the prescribed time.

D2.2_B - Graduates (Data available at …/…/…)

	a.y. xx-3/xx-2	a.y. xx-2/xx-1	a.y. xx-1/xx
N. of graduates			
Graduates holding to the cohort of a.y. xx-3/xx-2	-	-	
Graduates holding to the cohort of a.y. xx-4 / xx-3	-		
Graduates holding to the cohort of a.y. xx-5 / xx-4			
Graduates with graduation grade ≥ …			

D2.2_M - Graduates (Data available at …/…/…)

	a.y. xx-3/xx-2	a.y. xx-2/xx-1	a.y. xx-1/xx
N. of graduates			
Graduates holding to the cohort of a.y. xx-2/xx-1	-	-	
Graduates holding to the cohort of a.y. xx-3 / xx-2	-		
Graduates holding to the cohort of a.y. xx-4 / xx-3			
Graduates with graduation grade ≥ …			

Annex D3 - Results of the tests for the assessment of the students' learning

D3 - Results of the tests for the assessment of the students' learning (Data available at …/…/…)

Course units *	a.y. xx-3 / xx-2				a.y. xx-2 / xx-1				a.y. xx-1 / xx			
	N. of students **	N. of students who have overcome the exam ***	Average grade	Variation	N. of students **	N. of students who have overcome the exam ***	Average grade	Variation	N. of students **	N. of students who have overcome the exam ***	Average grade	Variation
…	…	…	…	…	…	…	…	…	…	…	…	…

* In alphabetical order.
** Number of students who had the course unit in their study plan in the year under consideration.
*** With reference to the students who had the course unit in their study plan in the year under consideration.

Annex E1.1 - Positions of responsibility for the QA of ESPs - Institution level

Positions of responsibility *	Composition **	Duties ***
...	...	...

* List all the positions of responsibility for the QA of ESPs of the Institution.

** Provide the composition of the position of responsibility under consideration (only in case of positions of responsibility composed by more people).
*** Indicate the duties of the position of responsibility under consideration.

Annex E2.1 - Processes and responsibilities for the ESP management

Standards	Processes	Possible sub-processes	In charge of the process / sub-process management (Position/s of responsibility collaborating in the process / sub-process management)	Documentation of the process/sub-process management	In charge of the approval of the process/sub-process management exits	Documentation of the approval of the process/sub-process management exits
A - Programme aims	A1 - Identification of the educational needs of the labour market and other stakeholders	Definition of the stakeholders of the labour market and other stakeholders to be consulted and of the methods and schedule of consultation				
		Identification of the stakeholders' educational needs				
	A2 - Definition of the programme educational objectives					
	A3 - Definition of the programme learning outcomes	Definition of the programme learning outcomes				
		Documentation of the coherence with the programme learning descriptors for ESPs				
B - Educational process	B1 - Design of the educational process	Definition of the curriculum				
		Definition of the characteristics of the course units				
		Definition of the characteristics of the graduation exam				
		Documentation of the suitability of the curriculum to the achievement of the programme learning outcomes				
	B2 - Definition of the students' admission, recognition,	Definition of qualifications and requirements for the admission to the ESP				

	progression and attestation rules	Assessment of the possession of the admission requirements				
		Definition of the criteria of admission				
		Definition of the rules for the recognition of higher education qualifications, periods of study and prior learning				
		Definition of the management criteria of the students' progression in their studies				
		Definition of the documentation provided to graduates after the completion of their studies				
	B3 - Planning of the educational process					
	B4 - Management of the educational process	Definition of the control of the correspondence of the development of the educational process with the designed and planned development				
		Control of the correspondence of the development of the educational process with the designed and planned development				
		Definition of the control of the assessment tests and of the final work/thesis				
		Control of the adequacy of the assessment tests and of the final work/thesis				
C - Resources	C1 - Identification and appointment of the teaching staff	Definition of the criteria of recruitment /selection/choice of the teaching staff				
		Appointment of the teaching staff				

		Organization of the activities for improving the didactic skills of the teaching staff				
		Definition of the criteria of recruitment /selection/choice of the teaching support staff				
		Appointment of the teaching support staff				
	C2 - Identification and allocation of facilities (in particular: lecture and study rooms, laboratories, libraries) and support staff	Provision of lecture rooms and surveillance / assistance staff				
		Provision of study rooms and surveillance / assistance staff				
		Provision of laboratories and technical staff				
		Provision of libraries and librarian staff				
	C3 - Identification of the needs and allocation of financial resources	Identification of the needs of financial resources				
		Allocation of financial resources				
	C4 - Organisation and management of student support (orienteering, tutoring and assistance) services	Organisation and management of student administrative office				
		Organisation and management of orienteering service for incoming students				
		Organisation and management of tutoring service				
		Organisation and management of service for carrying out training periods outside University				
		Organisation and management of international mobility service				
		Organisation and management of job placement service				
	C5 - Establishment of partnerships with national and international businesses,	Definition of partnerships for carrying out training periods outside University				

	research institutions and other Higher Education Institutions for carrying out students' external education and international mobility	Monitoring of the training periods outside University				
		Definition of partnerships for carrying out international mobility periods				
		Monitoring of the international mobility periods				
D - Monitoring	D1 - Monitoring of incoming students					
	D2 - Monitoring of students' progression in their studies					
	D3 - Monitoring of students' learning					
	D4 - Monitoring of students' feedback on the educational process	Definition of monitoring instrument and schedule of students' feedback on course units				
		Monitoring of students' feedback on course units				
		Definition of monitoring instrument of students' feedback on training periods outside University				
		Monitoring of students' feedback on training periods outside University				
		Definition of monitoring instrument of students' feedback on periods of international mobility				
		Monitoring of students' feedback on periods of international mobility				
		Definition of monitoring instrument and schedule of feedback of final year students on educational process and student support services				

		Monitoring of feedback of final year students on educational process and student support services				
	D5 - Monitoring of graduates' placement	Definition of monitoring instrument and schedule of graduates' job placement				
		Monitoring of graduates' job placement				
		Monitoring of continuation of the studies in second cycle programmes *(only for first cycle ESPs)*				
		Monitoring of continuation of the studies in PhD programmes *(only for second cycle ESPs)*				
	D6 - Monitoring of employed graduates' and employers' feedback on graduates' education	Definition of monitoring instrument and schedule of employed graduates' feedback on education received				
		Monitoring of employed graduates' feedbacks on education received				
		Definition of monitoring instrument and schedule of employers' feedback on graduates' education				
		Monitoring of employers' opinion on graduates' education				

E - Management System	E1- Definition of the policy, processes and organization f of the Higher Education Institution for the quality assurance of study programmes					
	E2 - Definition of the management system of the study programme					
	E3 - Review of the study programme					
	E4 - Provision of public access to information on the study programme					

Annex E2.2 - Positions of responsibility - School, Department and Study Programme level

Positions of responsibility *	Composition **	Duties ***
...	...	...

* List all the positions of responsibility for the management of the ESP.
** Provide the composition of the position of responsibility under consideration (only in case of positions of responsibility composed by more people).
*** Indicate the duties of the position of responsibility under consideration.

Annex E3 - Check-list for the self-assessment

Standard A - Programme Aims	
Quality Requirement A1 - Educational needs of the labour market and other stakeholders	A1.1 - Are the consulted stakeholders of the labour market and other stakeholders relevant to the identification of the stakeholders' educational needs?
	A1.2 Are methods and schedule of consultation adequate to the identification of the stakeholders' educational needs?
	A1.3 - Have the educational needs of the stakeholders been identified in a way appropriate for the definition of the programme educational objectives and of the programme learning outcomes of the engineering study programme (ESP)?
Quality Requirement A2 – Programme aims	A2.1 - Have the programme educational objectives been defined in terms of professional profiles of the graduates, i.e. of functions graduates are to be prepared for and/or competences to be developed and obtained by graduates?
	A2.2 - Are the programme educational objectives consistent with the mission of the institution the ESP belongs to and the identified educational needs?
Quality Requirement A3 – Programme learning outcomes	A3.1 - Have the programme learning outcomes been established in terms of what students are expected to know, understand and/or be able to demonstrate after completion of the educational process?
	A3.2 - Are the programme learning outcomes consistent with the national qualification framework, if any, the established programme educational objectives and the programme learning descriptors for ESPs?

Standard B - Educational process	
Quality Requirement B1 - Design of the educational process	B1.1 - Does the whole of the learning outcomes of the course units correspond to the programme learning outcomes?
	B1.2 - Does the curriculum embed a student-centred teaching and learning approach that enables flexible learning paths and encourages students to take an active role in co-creating the learning process?
	B1.3 - Is the curriculum formally approved by another body besides the one composed by the only teaching staff of the ESP?
	B1.4 - Do the assessment methods and criteria provide evidence of their capacity to check the effective achievement of the intended course unit learning outcomes by the students and ensure trust that the level of achievement by the students is assessed in a credible way?
Quality Requirement B2 - Admission, recognition, progression and attestation	B2.1 - Are the qualifications and requirements for the admission to the ESP adequate for a profitable participation of students in the established educational activities, in particular of the first course year?
	B2.2 - Does the ESP check the effective possession of the admission requirements by the students?
	B2.3 - Are the criteria of admission objective?
	B2.4 - Has the ESP established appropriate rules for the recognition of higher education qualifications, periods of study and prior learning?
	B2.5 - Has the ESP established appropriate management criteria of the students' progression in their studies?
	B2.6 - Does the ESP provide graduates with appropriate attestation of the successfully completed studies?
Quality Requirement B3 - Planning of the educational process	B3.1 - Has the development of the educational process been planned in such a way that students are able to achieve the programme learning outcomes in the expected time, according to a gradual process and activities coherent and coordinated with each other?
Quality Requirement B4 - Management of the educational process	B4.1 - Does the ESP control the development of the educational process, in order to check its correspondence with the designed and planned development and resolve any urgent and immediate problem?
	B4.2 - Has the ESP developed the educational process coherently with the designed and planned development?
	B4.3 - Does the ESP control the assessment tests and the final work/thesis, in order to check their adequacy to the assessment of the achievement of the learning outcomes of the course units and of the final work/thesis by students and the correctness of the evaluation of the students' learning?
	B4.4 - Do the results of the control of the assessment tests and the final work/thesis provide evidence of their adequacy to the assessment of the achievement of the learning outcomes of the course units and of the final work/thesis and of the correctness of the evaluation of the students' learning?
Standard C - Resources	
Quality Requirement C1 - Teaching staff	C1.1 - Is the teaching staff appointed according to pre-definite criteria of recruitment/selection/choice?
	C1.2 - Are the quantity and qualification of the teaching staff adequate for the achievement of the established learning outcomes by students?
	C1.3 - Do the ESP or the structure the ESP belongs to offer the teaching staff the opportunity to improve their teaching skills, also in the use of new technologies, and achieve acceptable standards?

	C1.4 - Is the qualification of the teaching support staff adequate for the achievement of the established learning outcomes by students?
Quality Requirement C2 - Facilities and support staff	C2.1 - Are the facilities (in particular: lecture and study rooms, laboratories, libraries) at disposal of the ESP, with the associated equipment, quantitatively and qualitatively adequate for the development of the established educational activities with the established educational methods?
	C2.2 - Are the quantity and qualification of the support (surveillance/assistance, technical, librarian) staff adequate for the development of the established educational activities as designed and planned?
	C2.3 - Has the ESP at disposal other resources (transports, canteens, student accommodations, sports facilities, etc.) and/or does the ESP or the structure it belongs to undertake special initiatives (cultural initiatives, recreational activities, etc.) useful to the effectiveness of the educational process?
Quality Requirement C5 - Financial resources	C3.1 - Has the ESP identified the needs of financial resources?
	C3.2 - Are the available financial resources adequate for the development of the educational process as designed and planned?
Quality Requirement C4 - Student support services	C4.1 - Has the ESP at disposal student support (orienteering, tutoring and assistance) services relevant to the educational process and able to make students' learning and progression in their studies easier?
	C4.2 - Are the quantity and qualification of the administrative staff adequate for an effective management of the student support services?
Quality Requirement C5 - Partnerships	C5.1 - Are the quantity and quality of the partnerships with national and/or international public and/or private bodies for carrying out training periods outside University adequate to the achievement of the intended learning outcomes?
	C5.2 - Can the number of students who have carried out training periods outside University be considered satisfactory?
	C5.3 - Are the quantity and quality of the partnerships with other Higher Education Institutions for international mobility adequate to the achievement of the intended learning outcomes?
	C5.4 - Can the number of students who have carried out periods of international mobility in exit and in entrance be considered satisfactory?
Standard D - Monitoring	
Quality Requirement D1 - Incoming students	D1.1 - Do the results of the monitoring of the incoming students provide evidence of the ESP attractiveness?
Quality Requirement D2 - Students' progression in their studies	D2.1 - Do the results of the monitoring of the students' progression in their studies (in particular: enrolments at the different course years, time to graduation) provide evidence of the effectiveness of the educational process?
Quality Requirement D3 - Students' learning	D3.1 - Do the results of the monitoring of the students' learning provide evidence of the effectiveness of the course units?
Quality Requirement D4 - Students' feedback on the educational process	D4.1 - Has the ESP defined effective instruments and schedules for the monitoring of the students' feedback on the educational process (in particular: students' feedback on the course units, on the training periods outside University, on the periods of international mobility; final year students' feedback on the educational process and on the student support services), in order to check the perceived adequacy and effectiveness?

	D4.2 - Do the results of the monitoring of the students' feedback on the educational process provide evidence of the adequacy and effectiveness of the educational process and of the student support services?
Quality Requirement D5 - Graduates' placement	D5.1 - Has the ESP defined effective instruments and schedules for the monitoring of the graduates' placement (in particular: graduates' job placement, continuation of the studies in second cycle programmes *(only for first cycle programmes)*, continuation of the studies in PhD programmes *(only for second cycle graduates)*), in order to check the demand of the granted qualification and the correspondence of the programme educational objectives and programme learning outcomes to the educational needs of the labour market?
	D5.2 - Do the results of the monitoring of the graduates' placement provide evidence of the demand of the granted qualification and of the correspondence of the programme educational objectives and programme learning outcomes to the educational needs of the labour market?
Quality Requirement D6 - Employed graduates' and employers' feddback on the graduates' education	D6.1 - Has the ESP defined effective instruments and schedules of monitoring of the employed graduates' feedback on the education received, in order to check the correspondence of the programme educational objectives and programme learning outcomes to the educational needs of the labour market?
	D6.2 - Do the results of the monitoring of the employed graduates' feedback on the education received provide evidence of the correspondence of the programme educational objectives and programme learning outcomes to the educational needs of the labour market?
	D6.3 - Has the ESP defined effective instruments and schedules of monitoring of the employers' feedback on the graduates' education, in order to check the correspondence of the programme educational objectives and programme learning outcomes to the educational needs of the labour market?
	D6.4 - Do the results of the monitoring of the employers' feedback on the graduates' education provide evidence of the correspondence of the programme educational objectives and programme learning outcomes to the educational needs of the labour market?
Standard E - Management system	
Quality Requirement E1 – Policy, processes and organization of the Higher Education Institution for the quality assurance of study programmes	E1.1 - Has the institution the ESP belongs to an adequate and public policy for the QA of ESPs?
	E1.2 - Has the institution the ESP belongs to effective processes and organization for the QA of ESPs?
Quality Requirement E2 - Management system of the study programme	E2.1 - Has the ESP implemented an effective management system, through the identification of the QA processes and the definition of the organisational structure?
Quality Requirement E3 - Review	E3.1 - Does the ESP periodically review programme aims, educational process, resources, results and management system in order to guarantee their continuing relevance and effectiveness and promote the improvement of the effectiveness of the processes for the ESP management and of the associated results?
Quality Requirement E4 - Publicly availability of information	E4.1 - Does the ESP make available on the web site of the ESP or of the structure the ESP belongs to full, up to date, easily acquired information, both

	quantitative and qualitative, on ESP aims, educational process, resources and results?