Accreditation
Criteria,
Guidelines
and
Procedures

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Cti 2012 Accreditation Criteria, Guidelines and Procedures

Cti
Commission des
Titres d'Ingénieur

Accreditation Criteria, Guidelines and Procedures

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Introduction

In 1934, the French law that created CTI (*Commission des Titres d'Ingénieur* - Engineering Degree Commission) set up the first, or at least one of the first, accreditation boards in France and Europe.

CTI is an active participant within the European Higher Education Area; it has been a full member of ENQA (European Association for Quality Assurance in Higher Education) since 2005 and has been registered in EQAR (European Quality Assurance Register) since 2010. CTI is also a founding member of ENAEE (European Network for the Accreditation of Engineering Education) and is one of the agencies authorized to deliver the EUR-ACE label (a quality accreditation label for engineering programmes, developed by ENAEE). CTI also participates in the work of ECA (European Consortium for Accreditation).

Since 1997, all French engineering programmes must be accredited every six years by CTI. Following successful accreditation by CTI, engineering higher education institutions (hereinafter called HEI or institution) are authorized ("habilitées") by the French ministry to deliver engineering degree programmes and to award to successful students the "Diplôme d'ingénieur", a degree at the master level that gives access to the engineering profession and to doctoral studies in France.

Upon receipt of a request from a foreign institution, CTI is also authorized by French law to accredit engineering programmes outside France. Following successful accreditation and the receipt of a request from the concerned government, the French government may grant "State Admission" status to such degrees.

CTI is currently active in Belgium, Bulgaria, Burkina Faso, China, Vietnam, Morocco, Switzerland and Spain. CTI accreditation is also recognized at European level as CTI is entitled to award the EUR-ACE label to engineering degree programmes which it has accredited.

This document is primarily aimed at higher education institutions outside France which wish to obtain accreditation of its engineering degree programmes by CTI. CTI accreditation applies to engineering degree programmes at the master level.

This "Accreditation Criteria, Guidelines and Procedures" document contains the standards and guidelines for accreditation by CTI; it also provides a guiding framework for the preparation of the self-evaluation report and the site visit. This is the result of experience gained by CTI since 1934, more specifically during the past two decades due to the considerable increase in the number of engineering degree programmes during that period. It is designed as a framework within which Engineering schools can develop their own initiatives and innovations. CTI has also brought these guidelines into phase with those published in documents by national, European and international higher education evaluation organisations, in particular, those concerning engineering.

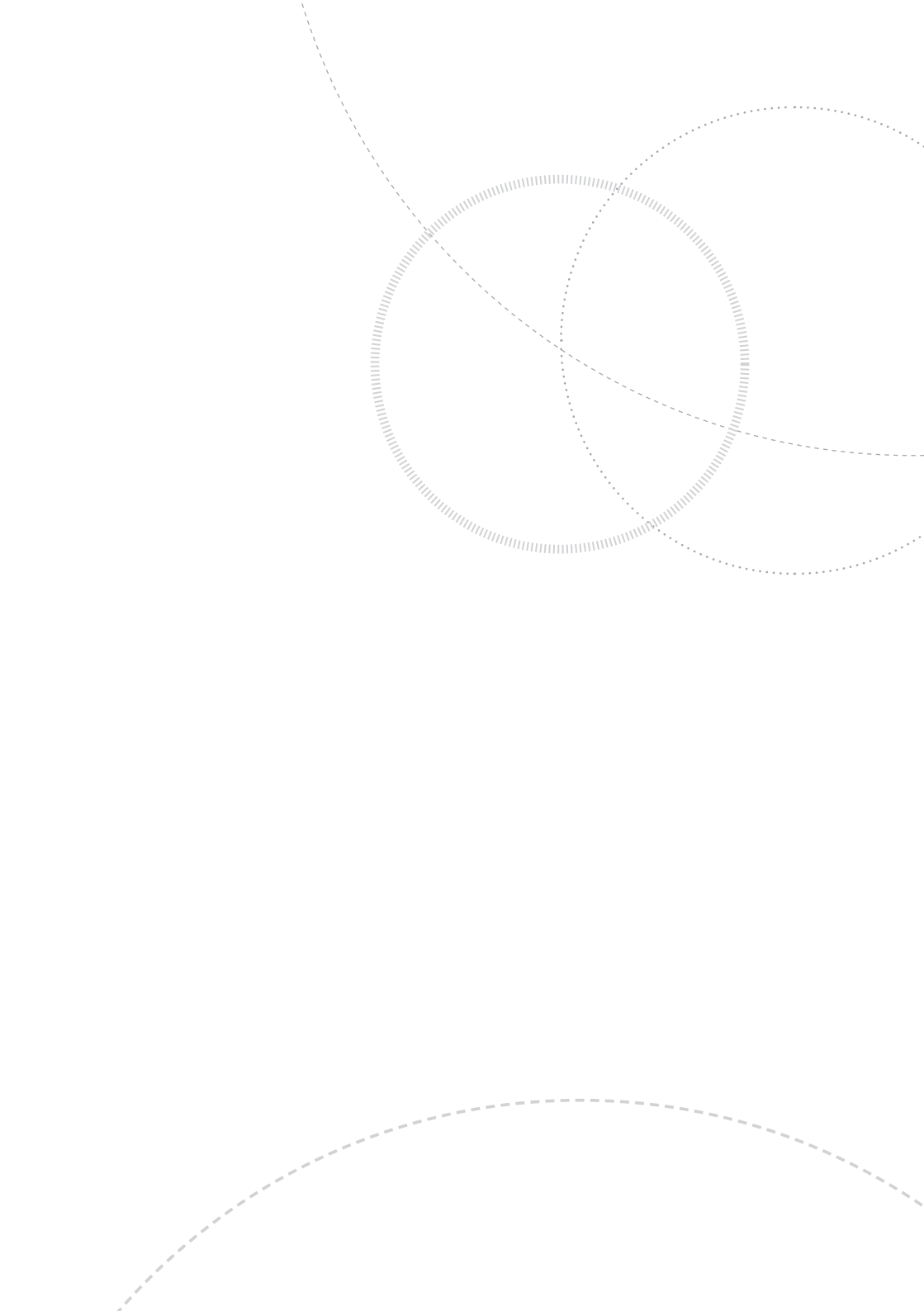

Table of content

1

The Accreditation of engineering programmes by CTI; General principles and processes

1.1. MISSION, STATUS AND STRUCTURE OF CTI

The "Commission des titres d'ingénieur" (CTI) is a quality assurance organisation established by French law in 1934. CTI is the *de jure* and *de facto* cornerstone of engineering programme accreditation in France. Its mission includes:

* The accreditation of all French higher education programmes leading to the French engineering degree title of "Diplôme d'ingénieur"; State-owned HEIs are authorised to award the engineering degree ("habilitation") by the HEI's supervisory minister(s) upon receipt of CTI advice. Private HEIs are authorised by the minister of higher education upon receipt of a CTI accreditation decision.
* On receipt of a request from foreign higher education institutions, the accreditation of engineering degree programmes outside France.
* The publication of position statements on all issues related to engineering degree programmes. In particular, CTI sets the criteria and procedures for the accreditation of engineering degree programmes and contributes to their continuous improvement, in a European and international context.

CTI does not award engineering degrees to individuals. Neither is the ranking of higher education institutions or engineering schools part of its mission.

The composition of CTI consists of both professional and academic representatives. This composition brings together individuals from engineering education, the professional and corporate world, top labour organisations and engineering associations as well as experts in the field.

CTI accreditation activities are carried out using an extensive network of national and international experts as well as CTI members.

The names and affiliations of the members and experts of CTI are periodically published on its web page: **http://www.cti-commission.fr**

1.2. WHY APPLY FOR CTI ACCREDITATION?

EVALUATION AND ACCREDITATION EXPERTISE IN THE FIELD OF ENGINEERING EDUCATION

CTI provides specific evaluation and accreditation expertise in the field of engineering education and is currently active in Belgium, Bulgaria, Burkina Faso, Italy, China, Morocco, Switzerland, Spain and Vietnam.

CTI accreditation standards are the result of experience gained since its establishment in 1934. These standards have proved to be a powerful tool for guiding the development and improvement of engineering programmes at the master level; at the same time, they provide a flexible framework within which HEIs of very different types can develop their own strategies and innovations.

CTI accreditation is recognized both at national and European level.

NATIONAL RECOGNITION OF CTI ACCREDITATION: ADMISSION OF ENGINEERING DEGREES BY THE FRENCH MINISTRY OF HIGHER EDUCATION ("STATE ADMISSION")

Upon the concerned government's request, the French Ministry of Higher Education may grant "State Admission" status to foreign engineering degree programmes accredited by CTI for the **maximum accreditation period [cf. 1-6].**

State admission for a foreign degree gives the degree-holder the right to use the *"Titre d'ingénieur diplomé"* (graduate engineering title) in France. These engineers can then benefit from full engineer status in France.

The list of all programmes giving access to the *"Titre d'ingénieur diplomé"* is published every year in the *Journal Officiel de la République Française* (France's Official Journal); it is available on the CTI website: **http://www.cti-commission.fr**

EUROPEAN RECOGNITION OF CTI ACCREDITATION: THE EUR-ACE LABEL — EUROPEAN SYSTEM FOR ACCREDITATION OF ENGINEERING EDUCATION (EUR-ACE)

EUR-ACE® is the European quality label for engineering degree programmes at First Cycle (Bachelor) and Second Cycle (Master) level.

The EUR-ACE® system encompasses all engineering branches and profiles, is internationally recognized and facilitates both academic and professional mobility.

CTI is one of the six accreditation bodies (as at July 2012) entitled to deliver the EUR-ACE label to second-cycle (master) engineering programmes.

When requested by the concerned HEI, CTI can award the EUR-ACE label to those programmes accredited for the **maximum accreditation period [cf. 1-6].**

More information on the EUR-ACE system is available at: **http://www.enaee.eu**

1.3. WHO CAN APPLY FOR CTI ACCREDITATION? ADMISSIBILITY CRITERIA

* CTI is concerned with engineering degree programmes at the master level (level 7 in the European Qualifications Framework) only.
* CTI can accredit programmes with different structures (integrated programmes, master or second cycle programmes). In any case, CTI considers that the whole engineering higher education cycle (bachelor plus master) should have a minimum duration of 10 semesters (300 ECTS).
* CTI can accredit programmes whose main language of delivery is neither French or English. However, as English is currently acknowledged as the global working language, a good command of English by the graduates is expected. In the case of programmes expecting to obtain State admission from the French Minister of higher education, graduates should also demonstrate a good command of French.
* Engineering programmes being submitted for accreditation by CTI should be consistent with the definition of the engineering profession and criteria for an engineering degree programme of CTI.
* CTI cannot accredit engineering programmes which have recently obtained a negative accreditation decision by any accreditation body operating in the country of origin of the applicant HEI (ministry, accreditation agency, engineering professional body, etc.)

In any case, when performing accreditation missions outside France, CTI always proceeds with the agreement of the concerned national authorities (ministry of higher education, etc.) and in coordination with its national counterparts (national agencies, accreditation bodies, etc.).

1.4. THE ENGINEERING PROFESSION

Even though there are several professions under the engineering umbrella, CTI has adopted the following global definition of engineering:

Engineering can be defined as the posing and answering of complex questions in an effective and innovative way, in the fields of creation, design, production and implementation, within a competitive environment and with a focus on products, systems or services, and possibly their financing and sale. As such, engineers should have a good understanding of technical, economic, social and human issues, based upon a solid scientific background.

Engineering fields are increasingly broader and may overlap several disciplines. Engineers primarily work in industry, construction and public works, agriculture and services. In order to ensure clear national and international understanding, CTI advises engineering HEIs to refer to French official glossaries, such as the one proposed by the National Register of Professional Certifications, as well as to the classifications of engineering branches developed at an **international level [cf. Annex]** (suc h as the IEA/ENAEE Glossary, or the OECD list of engineering branches).

Engineers operate within a wide range of activities. CTI has developed the following classification:

1. Basic and applied research
2. Engineering studies, consulting and expertise
3. Production, operation, maintenance, testing, quality, safety
4. Information systems
5. Project management
6. Customer relations (marketing, sales, customer support)
7. Management, human resources
8. Training

In general, engineers evolve throughout their careers. They often start with activities 1, 2, 3 or 4 and then move on to activities 5 or 6, before working in 7. They may work in 8 to some extent throughout their careers.[1]

1.5. CTI CONCEPTION FOR AN ENGINEERING DEGREE

CTI criteria and procedures respect institutional autonomy and diversity. Nevertheless, all CTI accredited programmes should be able to produce graduates satisfying the following general profile:

1. LONG TERM ADAPTABILITY AND ANALYTICAL CAPABILITIES

A strong and broad basis in fundamental sciences is essential in order to guarantee analytical competence and the capacity for adjusting in the long term to the demanding evolution of engineering and management activities.

Therefore, graduates should recognise the need for, and have the ability to engage in independent, life-long learning.

2. SHORT TERM ADAPTABILITY TO PROFESSIONAL ACTIVITY WITHIN A BRANCH OF ENGINEERING

Graduates should be able to adapt effectively in a relatively short period to professional activity within a branch of engineering. To enable this, the programme should provide the necessary understanding of engineering knowledge and tools as well as the required practical skills.

The programme should also provide the necessary services (career counselling...), activities (internships, projects, simulations...) and conditions (interaction of students with industry and professionals) so as to ensure effective transition from the academic to the professional world.

[1] See IESF [Ingénieurs Et Scientifiques de France] Surveys

3. RESEARCH AND INNOVATION

Engineering graduates should have the appropriate preparation and competences so as to be able to incorporate a research and innovation dimension to their engineering work (critical analysis of scientific information at the forefront of the branch, experimentation, innovative problem solving and engineering design...).

Graduates should be able to carry out PhD studies after finishing the programme.

4. BUSINESS CULTURE AND ECONOMIC, SOCIAL, ENVIRONMENTAL AND ETHICAL AWARENESS

Together with a sound scientific and technical cultural approach, engineering graduates should also have an understanding of business culture; they should also be aware of economic, social, ethical and environmental challenges.

5. COMMUNICATION SKILLS AND INTERNATIONAL AWARENESS

Engineering graduates should be able to communicate effectively in a professional context at national and international levels. Graduates should have the capacity to work in multidisciplinary and international contexts.

CTI has developed a set of **accreditation criteria [cf. section 2]** in accordance with this general profile. Accreditation criteria obviously focus on the degree programme itself, but they also deal with the institutional context in which the programme exists. For this reason, the criteria include governance and organisational issues; these are often at the root of problems observed in degree programmes in which deficiencies are identified during the accreditation process.

The accreditation standards are also compatible with the EUR-ACE Framework Standards for accreditation (Second-cycle standards).

1.6. THE ACCREDITATION PROCESS

The accreditation process consists of four phases:

* Preliminary admissibility phase
* Evaluation phase
  ** The preparation of the self-assessment report by the institution
  ** Planning and appointment of the audit team
  ** The on-site visit
  ** The external evaluation report
* Accreditation phase
* Communication of results

PRELIMINARY ADMISSIBILITY PHASE

The higher education institution **contacts CTI [cf. 3-1]** in order to request accreditation for all or some of its degree programmes. Prior to doing so, the HEI should study the "Accreditation Criteria, Guidelines and Procedures" document of CTI. The institution then transmits **some basic information [cf. 3-1]** about the institution and the programme to be accredited.

After receiving this information, CTI checks that the request is **admissible [cf. 1-3]** and contacts its corresponding national counterparts (national agencies, professional bodies...). One or more meetings might be necessary in order to clarify the request.

EVALUATION PHASE

The preparation of the self-assessment report by the institution

If CTI deems the request to be admissible, the higher education institution is invited to prepare a self-assessment report. The preparation of this report must form part of the programme self-evaluation process and include the participation of all relevant persons.

In preparing the report, the HEI should refer to the section **"relevant documents for the assessment phase" [cf. 3-2]** of this document.

Selection and appointment of the audit team

On receipt of the self-assessment report, CTI appoints an audit team to evaluate the programme. The composition of the team will vary depending on the characteristics of the programmes to be accredited (engineering branches, the number and size of the programmes, etc.). It is generally made up of three to six people, in accordance with the following criteria:

* A number of academic peers, as considered necessary to deal with the engineering branches under accreditation,
* At least one expert from the professional world,
* In accordance with European recommendations, representatives from student organisations may be invited to participate.

One of the members of the audit team acts as chair; he/she will be responsible for coordinating the team activities and for presenting the external evaluation report to the CTI general assembly during the **accreditation phase.**

Observers from the country of the institution requesting the accreditation, as may be required in mutual recognition and other collaboration agreements established with other national quality assurance agencies may be appointed.

The on-site visit

The CTI **on-site visit [cf. 3-3]** must include meetings with all the relevant internal and external stakeholders and partners concerned with the programme, that is:

* Management team of the programme and higher education institution senior management.
* Faculty
* Administration and services staff
* Students at various stages of the programme
* Employers
* Alumni

Classrooms, research laboratories and other facilities and equipment will be visited during the on-site visit.

The visit should also allow enough time to examine a number of **relevant documents [cf. 3-2]** (examples of final year projects, exams, etc.) which should be provided during the visit.

Depending on the number of programmes for evaluation and the size of the institution, the visit could last from one single day to a whole week.

The external evaluation report

The result of the evaluation phase is an external evaluation report. This report is prepared by the audit team under the supervision of the chair.

The report will include a thorough analysis of the programme and its institutional context; it will identify its main strengths and weaknesses and will include a judgement on the compliance of the programme with the accreditation standards of CTI.

The report, excluding conclusions or proposals, will be sent to the management team of the programme for comment. These comments are then sent to the audit team before the final report is drawn up.

The final external evaluation report is sent to the CTI registry which then transmits it to the CTI plenary assembly. This report is not published by CTI.

ACCREDITATION PHASE

The plenary assembly is the main decision-making organ in CTI. It is responsible for making all accreditation decisions on the basis of the final external evaluation report prepared by the audit team.

Possible results of CTI accreditation are:

* Accreditation for the maximum accreditation period (6 years), if the programme substantially complies with all CTI standards.
* Accreditation for a lesser period (normally 3 years), if some important problems are detected.
* No accreditation, if critical compliance problems are detected.

The final outcome of the accreditation phase is a report which contains the final accreditation decision and recommendations for improvement of the programme(s).

COMMUNICATION OF ACCREDITATION RESULT

Following adoption at the CTI plenary assembly, the accreditation report is sent to the higher education institution and to the management team of the programme.

In accordance with European recommendations, the accreditation report is made public on the CTI website.

For those programmes which have been accredited for the maximum accreditation period, the result of CTI accreditation may, upon the concerned government's request, result in "State admission" of these programmes by the French government.

Upon receipt of a request from the concerned HEI, CTI can award the EUR-ACE label to those programmes which fulfill all CTI accreditation criteria.

2

Standards for the accreditation of engineering programmes [within applicant HEI]

A. MISSION AND ORGANISATION OF THE HEI

A.1. MANAGEMENT STRUCTURE, STRATEGY AND AUTONOMY

A.1.1. MANAGEMENT STRUCTURE

A management structure, that enables proper implementation of the engineering programme, should be in place. This management structure should be transparent with a clear and distinct identity.

A.1.2. STRATEGY

The HEI should have a global strategy which specifies the position and role of engineering education and of the programme for accreditation in the institution. This strategy should be published.

A.1.3. AUTONOMY

The management of the engineering programme should be autonomous to enable it to adequately pilot the programme towards attaining its objectives. It should have a permanent staff and enough material resources to enable it to carry out its mission and guarantee the sustainability of the programme.

A.2. ENGINEERING EDUCATION POLICY AND OBJECTIVES

The HEI should have developed an engineering education policy which has considered the needs of all concerned stakeholders (students, industry, engineering associations, etc.) and is consistent with the global strategy of the institution.

The institution should be promoting the dissemination of scientific and technical knowledge to companies and society and should be providing information on engineering jobs, education and training, especially to secondary schools.

SOME ADDITIONAL GUIDELINES

The HEI should be aware of the new competence needs arising at the different stages of an engineer's professional career. The development of a policy in the continuous and vocational education sector in order to address these needs is strongly recommended.

A.3. ORGANIZATION AND MANAGEMENT OF THE ENGINEERING SCHOOL

A.3.1. STAKEHOLDER PARTICIPATION

The concerned stakeholders, i.e. students, faculty, alumni and employers, should be involved in the organization and management of the programme.

A.3.2. GOVERNANCE

The management of the engineering school should be governed by a strong and efficient team; its position within the higher education institution should be secure enough to ensure that the objectives of the programme are attained.

A.3.3. ORGANIZATION

The management of the engineering school and its decision making processes should be well organized such that the implementation of the strategy and policy of the programme's development is carried out properly.

A.3.4. MANAGEMENT

The engineering programme should be managed in accordance with efficient, fair and transparent processes. Specifically, the key administrative processes (human resources, finance and account management,quality management) and the key academic processes (teaching methods,

student registration and other academic services) should have been formalized optimally and in a satisfactory way for all stakeholders.

The management of the processes and information about the programme should be supported by a sound and efficient IT infrastructure.

A.4. PROMOTION OF THE ENGINEERING PROGRAMME

The regional, national and international positioning strategy of the programme should be defined and the programme actively promoted in accordance with this strategy.

The external promotion of the programme should be organized and be consistent with its internal promotion; this promotion should be such that it has a positive impact on the reputation of the HEI and the programme.

Qualitative and quantitative information on the HEI and the programme (recruitment conditions, objectives, curriculum, assessment methods, results and performance) should be accessible to the general public.

A.5. HUMAN AND PHYSICAL RESOURCES

A.5.1. HUMAN RESOURCES

Human resources should be sufficient and appropriate to enable the proper implementation of the engineering programme. Specifically, teaching and other academic activities should be able to rely on a supply of a sufficient number of permanent, qualified, academic and research faculty members employed by the higher education institution.

The programme should also include the participation of external lecturers from the professional world.

A.5.2. PHYSICAL RESOURCES AND FACILITIES

Physical resources and facilities (lecture rooms, computer and information centers, library, etc.) should be sufficient and appropriate to provide the conditions necessary for the different academic and research activities.

A.5.3. FINANCIAL RESOURCES

The engineering programme should be able to rely on a variety of funding sources to enable appropriate functioning of the programme.

B. EXTERNAL LINKS AND PARTNERSHIPS

B.1. INDUSTRY LINKS

The engineering programme should have established lasting and mutually beneficial relationships with industry. Industry representatives should be actively participating in the management and implementation of the programme.

The engineering programme should be open to the needs of the engineering profession and teaching methods should be adapted in accordance with these needs.

B.2. RESEARCH AND INNOVATION LINKS

B.2.1. RESEARCH LINKS

The engineering programme should have established links and partnerships with internal or external research departments and/or organizations. A significant number of faculty members should have developed relevant research activity, mostly in contact with industry.

The research dimension should be integrated into the curriculum order to enhance the quality of the programme. Specifically, the curriculum should be constantly updated in accordance with new and emerging issues and technologies in the relevant branch of engineering and the students should have access to suitable equipment and research facilities.

B.2.2. INNOVATION AND KNOWLEDGE TRANSFER

The engineering programme should be contributing to innovation and knowledge transfer (innovation projects, patents, industry start-ups).

B.3. INTERNATIONAL LINKS

The engineering programme should be active and competitive at an international level.

The programme being evaluated should provide a multicultural learning experience (language courses, academic and professional exchanges, hosting of international students). Study periods and internships abroad should be adequately supervised and enable students to achieve the learning outcomes of the programme. Special attention should be devoted to the hosting and integration of international students.

Students, faculty and other relevant staff should be mobile and able to work at an international level.

B.3.1. INTERNATIONAL STRATEGY

The management team of the programme should have established an explicit international strategy which is consistent with the global strategy of the of the HEI.

B.3.2. ORGANIZATION AND INTERNATIONALIZATION

The management of the programme should be consistent with the international strategy of the programme and the institution.

The human and physical resources should be appropriate and sufficient to carry out this strategy.

SOME ADDITIONAL GUIDELINES

A person in charge of international affairs should be a member of the management team of the programme. He/she should be the head of a service or sub-structure responsible for (at least):

- *The management of outbound and inbound student and staff mobility*
- *The hosting and welcoming of international students*
- *Establishment of international academic partnerships and international relations*

The members of the management team and a significant number of faculty members should have foreign qualifications and/or professional experience.

B.3.3. PARTNERSHIPS AND INTERNATIONAL NETWORKS

The engineering programme should have established research and academic partnerships at an international level such that they impact on the quality and learning outcomes of the curriculum.

The programme should be involved in international educational and research networks and should be participating in international projects.

B.3.4. JOINT AND DOUBLE DEGREES

The higher education institution should have established a policy concerning joint and double degrees in the field of engineering education.

B.4. LINKS AT NATIONAL LEVEL

The engineering programme should be recognized at national level and should be involved in different networks and initiatives at national level, in the relevant branch of engineering.

B.5. LINKS AT LOCAL LEVEL

The engineering programme should have established lasting and mutually beneficial relationships with local industry, public authorities and other local actors in the field of engineering research and education. It should actively contribute to local innovation and research initiatives.

C. EDUCATIONAL PROCESS AND PROGRAMME

The educational objectives of the programme should reflect identified and significant scientific, technical, industrial and organizational competence needs of society and, specifically, of the engineering profession.

The educational objectives of the programme should be expressed in terms of programme outcomes. These outcomes should be consistent with the **mandatory general outcomes [cf. 1-5]** for accreditation of CTI and with the EUR-ACE programme outcomes for accreditation at the master degree level.

C.1. DESIGN AND UPDATING OF THE PROGRAMME

All concerned stakeholders should have been involved in the design of the curriculum. This design should reflect the needs of industry and society.

The educational and recruitment objectives of the programme should be periodically updated. The achievement of these objec-

tives, in terms of graduate profile and competences, should be properly assessed.

C.1.1. COMMUNICATION WITH STAKEHOLDERS

In order to develop further the design of the curriculum, the engineering school should have established effective relationships with international, national and local stake-holders.

Dialogue between the engineering school and its business environment should have been established, with the objective of developing and updating the profiles of the engineering graduates.

C.1.2. ANALYSIS OF FUTURE NEEDS

An analysis of future industry and social needs at international, national and local levels should be conducted on a regular basis.

C.1.3. APPROVAL OF NEW PROGRAMMES

The establishment of a new engineering programme should be based on a programme design process which has been formally approved and is regularly reviewed and updated.

C.2. PROGRAMME OUTCOMES AND LEARNING OUTCOMES

C.2.1. LEARNING OUTCOMES APPROACH

The educational objectives should be expressed in terms of programme outcomes; learning outcomes should be assigned to each module. These outcomes should be publicly available and clearly understandable to students and other stakeholders.

The curriculum content, teaching and assessment methods should be consistent with the learning outcomes approach.

C.2.2. PROGRAMME LEVEL AND GRADUATE PROFILE

The programme outcomes should be in accordance with those at master level (level 7) in the European Qualifications Framework and at Second Cycle level, in the EUR-ACE Framework Standards).

The graduate profile should be in accordance with the requirements of the **engineering profession [cf. 1-4].**

C.2.3. CONSISTENCY OF EDUCATIONAL OBJECTIVES

The programme educational objectives should be consistent with the mission of the HEI and with the needs of the stake-holders (such as students, industry, engineering associations, etc.). They must be achievable within the human and physical resources available for the programme.

C.2.4. PROGRAMME OUTCOMES FOR ACCREDITATION

The programme outcomes should be consistent with the general **programme outcomes [cf. 1-5]** established by CTI.

C.3. PROGRAMME CONTENT

C.3.1. COHERENCE WITH THE EXPECTED PROGRAMME OUTCOMES

The expected programme outcomes should be systematically broken down into the learning outcomes assigned to the individual modules of the programme. The objectives and contents of the individual modules should be organized so as to avoid any overlaps.

SOME ADDITIONAL GUIDELINES

In order to show the links between the different teaching modules and the expected programme outcomes, a graphical diagram (matrix) may be included in the programme self-assessment report.

C.3.2. CURRICULUM AND SYLLABUS CONTENT

The curriculum should be described clearly and should be properly structured. It should be made available to the relevant stakeholders, particularly students and faculty, and should provide a basis for the further development of the modules.

The descriptions of the different course modules should clearly indicate the knowledge, abilities and competencies students are expected to acquire, as well as the prerequisites for achieving them.

CTI considers that the duration of the engineering programme (bachelor plus master) should be at least 10 semesters and should cover all the necessary elements of engineering education (basic sciences, engineering sciences, methods and techniques, project and risk management, research and innovation, etc.).

C.4. PROGRAMME DELIVERY

C.4.1. DESCRIPTION OF THE CURRICULUM

The curriculum should be clearly described in terms of schedule, workload, methodology etc. and should be made public. If the curriculum is delivered in Europe, it should be structured using European guidelines (ECTS, semesterisation etc.)

C.4.2. LEARNING PROCESS

C.4.2.1. DELIVERY MODES AND PRACTICAL ELEMENTS

Courses should be taught using different delivery modes i.e. lectures, practical sessions, individual and team projects...

Along with a sound theoretical coverage of engineering theory and principles, the curriculum should include learning experiences which

enable the development of practical skills; these practical components should enhance early employability and reinforce the links of the programme with industry.

Courses must include fundamental or applied research activities.

SOME ADDITIONAL GUIDELINES

Learning experiences that contribute to the development of this practical dimension include:

- *Internships in industry*
- *Learning activities that reproduce real-life experiences (projects, simulations, and industry games);*
- *Industry visits, and seminars organized by industry representatives;*
- *Orientation activities and coaching;*

Engineering programmes seeking State admission status from the French Ministry of Higher Education should include a significant amount of industrial experience throughout the curriculum, mainly in the form of internships in industry.

C.4.2.2. WORK LOAD

The programme work load should be reasonable and enable students to achieve the programme outcomes. It should take into account contact hours, as well as the time devoted to self-study by the students at home. The ratio of contact hours to self-study should ensure the achievement of the defined programme outcomes.

The curriculum timetable should provide students with sufficient time to engage in independent learning.

Besides compulsory modules, there should be a sufficient range of elective subjects to enable students to develop an appropriate personal learning experience.

C.4.2.3. INFORMATION TECHNOLOGY AND TEACHING METHODOLOGY

The academic team delivering the programme should have devised teaching methods and tools which are appropriate to the different

modules. The team should also be up to date in relation to the latest teaching innovations and apply these accordingly.

An information and communications technology infrastructure, which covers the needs of the programme satisfactorily, should be in place.

C.4.3. ASSESSMENT OF LEARNING OUTCOMES

The assessment methods employed should be fair and consistent and enable the assessment of the level of achievement of the expected learning outcomes by the students.

Full information on the assessment methods used and examination results should be provided to the students.

The engineering programme should conclude with a final year project or equivalent, that guarantees that students can carry out an assigned task independently and at the master level. The final year projects, study periods, internships and other activities carried out externally should be subject to the control of the institution thus ensuring its meaningful incorporation into the curriculum.

C.4.4. STUDENT FOLLOW-UP AND TUTORING

As a complement to the learning experience, effective, personalized follow-up and tutoring of students should be provided. This tutoring should enable appropriate mentoring in the case of problems and should be such that it contributes to reducing examination failure rates.

C.5. INTERNATIONAL DIMENSION OF THE PROGRAMME

C.5.1. EXPECTED OUTCOMES

The engineering programme must be adapted to the international context and to global challenges.

The graduates of the programme must be able to work in an international context.

C.5.2. CULTURAL BACKGROUND AND LANGUAGE SKILLS

The learning experience should enable the students to develop a wide and international cultural mentality.

English is considered to be a fundamental communication tool at the professional level; in consequence, graduates should demonstrate a good command of this language (at least to B2 level).

The acquisition of a third language is strongly recommended.

SOME ADDITIONAL GUIDELINES

In the case of Engineering programmes seeking State admission status from the French Ministry of Higher Education, engineering graduates should demonstrate an appropriate command of English and French at the end of their studies (B2 level).

C.5.3. OUTBOUND MOBILITY

The programme should offer study periods or internship experiences abroad. These mobility experiences should be integrated into the curriculum and appropriately followed-up by the institution.

C.5.4. INBOUND MOBILITY

The programme should host international students of various nationalities in accordance with the international strategy of the institution. Specific measures and resources should be in place in order to enable the appropriate cultural and academic integration of these students.

The recruitment of international students should be managed effectively by the host institution in order to ensure that incoming students have the appropriate entry level and profile.

C.6. INDUSTRY AND RESEARCH INTERNSHIPS

Industry and research internships should be effectively managed by the institution and be consistent with the programme objectives and the particular objectives of the incoming student. They must be meaningfully integrated into the curriculum and be expressed in terms of expected learning outcomes.

SOME ADDITIONAL GUIDELINES

A compulsory period of internship in industry is considered by CTI as a particularly suitable method of achieving a number of important objectives for students:

* *To assure a certain awareness and openness of the students to the professional world, particularly to the societal, ethical and human aspects.*
* *To become acquainted with organizations and organizational structures.*
* *To be able to acquire some basic professional and relationship skills and understand their future role within the organization.*
* *To apply a combination of knowledge, competencies and attitudes learnt in the engineering studies to a real-life professional situation.*
* *To provide an initial contact with the professional sector, thus improving the early employability of the student.*

C.7. STUDENT LIFE

Resources and services should be in place to enable the appropriate integration and welfare of the students throughout the programme (housing services, counseling and health services, student clubs and associations, sports facilities, etc.).

Extracurricular activities should be regarded as making a fundamental contribution to the realization of the educational objectives and the personal development of the students.

C.8. ENGINEERING QUALIFICATION CERTIFICATE

An engineering qualification certificate should be issued to graduates upon the effective achievement of the programme outcomes.

The engineering qualification should be an entry route to the engineering profession.

In Europe, a Diploma Supplement in the English language must be issued in addition to the qualification certificate.

The title of the qualification must be consistent with existing regulations at the national level and must also respect the conventions and recommendations established at the **international level [cf. 1-4].**

SOME ADDITIONAL GUIDELINES

If an official professional body (charter, registry, association…) exists in the country, the engineering qualification should be accepted by the professional body as an appropriate entry to the profession.

D. STUDENT SELECTION AND ADMISSION

D.1. SELECTION AND ADMISSION STRATEGY

The management team of the programme should have established a selection and admission strategy; this strategy should respect national regulations in force and be consistent with the programme objectives and the global HEI strategy.

D.2. STUDENT SELECTION AND ADMISSION ORGANIZATION

The selection and admission process should be organized in a rigorous and fair way. Clear and sufficient information on selection criteria and methods should be communicated to the concerned stakeholders.

D.3. SOURCES OF ADMISSION AND ATTENTION TO DIVERSITY

The programme should be actively promoted among potential students of different origins and profiles.

The recruitment methods and criteria should be flexible enough to adapt to the characteristics of the different student origins (socio-economic origin, national origin, physical or mental handicap…) while also ensuring that all candidates are treated equally. Compensation measures applied should not lower the entry level of the programme.

Supplementary activities/courses should be available during the early stages of the programme in order to minimize student failure.

D.4. ADMISSION CRITERIA

The admission criteria should be expressed in terms of expected entry requirements and be consistent with the objectives and programme outcomes.

SOME ADDITIONAL GUIDELINES

Regulations should be in place covering the recognition of professional and academic activities completed externally. They should contribute to the achievement of the programme outcomes at the intended level.

E. GRADUATE EMPLOYMENT

E.1. GRADUATE EMPLOYMENT SURVEYS

Employment surveys should be carried out periodically in order to evaluate the job market within the professional sectors or engineering branches of the programme.

E.2. CAREER INFORMATION AND COUNSELING

Students should have access to sufficient information and counseling concerning the job market and their career perspectives. Specific activities should be organized in order to facilitate the transition between the academic and employment period (job-searching workshops, coaching, etc.).

E.3. GRADUATE EMPLOYABILITY ANALYSIS

Graduate employability should be a major concern for the engineering programme management team.

Surveys should be conducted periodically in order to study the employability of the programme graduates (time to get the first job, wages, kind of position, type of contract and status). The educational objectives of the programme should reflect employability indicators.

E.4. EMPLOYER SATISFACTION

An employer survey should be periodically carried out to verify that employers are satisfied with the performance of the programme graduates they recruit.

E.5. ALUMNI RELATIONSHIP

The programme management team should have developed structured contact with alumni and should promote the creation of an alumni network. Alumni should contribute in an active way to the programme's development.

F. QUALITY ASSURANCE

F.1. INTERNAL QUALITY ASSURANCE POLICY

An explicit internal quality assurance policy, aimed at the continuous improvement of the programme should have been established. This policy should be consistent with the global strategy of the HEI and be supported by the management team.

F.2. INTERNAL QUALITY ASSURANCE IMPLEMENTATION

F.2.1. MANAGEMENT TEAM INVOLVEMENT

The programme management team and the HEI's directorate should be explicitly committed to the development of an organizational culture which recognizes the importance of quality and continuous quality improvement.

F.2.2. INTERNAL QUALITY MANAGEMENT

An internal quality management system should be in place.

Sufficient organizational, personal and physical resources should have been allocated, enabling the appropriate implementation of the internal quality assurance system.

All persons concerned should be involved with and committed to continuous quality improvement. They should be communicating effectively with each other and work in a confident and positive organizational climate.

SOME ADDITIONAL GUIDELINES

The organization of the quality management system should be headed by a person who is close to the management team, from a hierarchical point of view.

F.2.3. STAKEHOLDER INVOLVEMENT

Concerned stakeholders, especially the students, lecturers and employers, should be actively involved in the programme activities.

The satisfaction of stakeholders with the programme should be periodically surveyed and the results of these surveys taken into account in curriculum development activities.

F.2.4. EXTERNAL COMMUNICATION AND TRANSPARENCY

All relevant information regarding the programme (admission procedures and criteria, syllabus, planning, teaching and assessment methods, programme results…) should be clear and publicly available for all relevant stakeholders (students, families, employers, government, etc).

Periodically, information concerning the evolution of the programme outcomes and graduate employability should be published.

F.3. GUIDING PRINCIPLES

F.3.1. CONSIDERATION OF NATIONAL AND INTERNATIONAL REGULATIONS AND GUIDELINES

The quality assurance system should take into account relevant national and international regulations and guidelines concerning quality assurance (e.g. European Standards and Guidelines for Quality Assurance in European Higher Education Area).

F.3.2. ACCOUNTABILITY

The programme should be managed in a rigorous, responsible and sustainable way and financial information should be available to society, government and other relevant stakeholders.

F.3.3. INTERNAL MANAGEMENT

The programme should be managed effectively and efficiently and without excessive bureaucracy.

F.4. CONTINUOUS IMPROVEMENT CYCLE

F.4.1. IDENTIFICATION AND FORMALIZATION OF PROCESSES

The main processes and work flows should have been identified and formalized (management structure, procedures manual, etc.). The HEI should have paid special attention to certain key processes, such as the approval, monitoring and periodic review of programmes and awards, the assessment of students and the performance of teaching staff.

F.4.2. SYSTEMATIC EVALUATION OF ACADEMIC PERFORMANCE

The main processes and results should be periodically evaluated. This evaluation should be carried out in a systematic way and with the participation of all concerned stakeholders (students, faculty, employers, etc).

F.4.3. SWOC ANALYSIS

The periodic self-assessment should enable the identification of the main strengths, weaknesses, opportunities and challenges of the programme, and of possible strategies for improvement.

F.4.4. STRATEGY FOR IMPROVEMENT

A strategy for improvement should be established in accordance with the results of the SWOC analysis. This strategy should be specific, measurable, achievable, realistic and time-bound.

F.4.5. ACTION PLAN

An action plan should have been established in order to implement the strategy. The plan should include the different actions to be performed, the time line and the people responsible for conducting these actions. The plan should be periodically revised and corrective measures taken where necessary.

F.4.6. IMPACT MEASUREMENT AND COMMUNICATION

The effectiveness of the action plan should be measured and the results communicated to the stakeholders.

F.5. EXTERNAL QUALITY ASSURANCE

F.5.1 EXTERNAL QUALITY ASSURANCE INITIATIVES

The program should have been periodically evaluated by an external and independent body or team. The results of the external evaluation should have been communicated to the relevant internal and external stakeholders (students, faculty, society, employers and government).

F.5.2. INCORPORATION OF EXTERNAL QUALITY ASSURANCE RESULTS INTO THE CONTINUOUS IMPROVEMENT CYCLE

The results of the external review should be integrated into the continuous improvement cycle.

3

Documents and procedures

3.1. APPLYING FOR CTI ACCREDITATION

Requests for accreditation must be addressed by e-mail or ordinary mail to:

International Relations
Commission des Titres d'Ingénieur
34 avenue Charles de Gaulle
F-92200 Neuilly sur Seine - France
Tél : + (33) (0)141 923 779
direction.programmes@cti-commission.fr
http://www.cti-commission.fr/

The evaluation and accreditation of engineering programmes abroad is among the activities of CTI *"Commission des Titres d'Ingénieur"*. Currently, CTI is active in various European and non-European countries, including Belgium, Switzerland, China, Morocco, Vietnam, Bulgaria and Burkina Faso.

When an institution outside France requests accreditation by CTI, a prior analysis is made by CTI in order to assess the admissibility of the request in the context of CTI's resources and to anticipate any other possible difficulties (regulatory or structural barriers).

The following information is necessary in order to assess the admissibility of the request:

* General information on the institution (name, official status, size, degree programmes offered and number of students)
* General information on the programme to be accredited:
  ** Date of establishment, number of students, engineering branch,

** Level, number of years of studies, ECTS,

** Governance (team/ entity in charge of managing the programme),

** Brief description of the programme outcomes and organization of the programme and of the main teaching blocks (presence of industry internships, projects, practical and theoretical training, language of delivery),

** Is this engineering degree an official engineering programme in the country of origin? Has it been accredited by the corresponding authorities (ministry of education, quality assurance agency, professional body)?

* Motivation for requesting CTI accreditation (legal obligation in the country of origin, EUR-ACE label, etc.)

The admissibility of the request will be determined in accordance with **CTI admissibility criteria [cf. 1-3].**

3.2. RELEVANT DOCUMENTS FOR THE EVALUATION PHASE

DOCUMENTS TO BE INCLUDED IN THE APPLICATION FOR ACCREDITATION

Once the accreditation request has been accepted by CTI, a full application may be prepared by the institution. This should include the following documents:

* A self-assessment report in relation to the engineering programme under accreditation

* Annexes

* Quantitative data

THE SELF-ASSESSMENT REPORT

The report, excluding annexes, should be no longer than 40 pages. It can be written in English or French. If it is written in English, an abstract in French should also be included.

Brochures, leaflets and other documents may be attached to the report as annexes and may be presented in their original language. In such a case, a brief description of the content of the annexes in French or English must be included in the application. In any case, a description of the structure and content of the programme (curriculum) must be provided in French or English.

All these documents must be provided to the CTI audit team in electronic format (CD). The self-assessment report must also be submitted to the CTI registry at the following address:

Greffe de la CTI
Ministère de l'enseignement supérieur et de la recherche
Direction générale pour l'enseignement supérieur et l'insertion professionnelle
Service de la stratégie de l'enseignement supérieur et de l'insertion professionnelle
Mission des écoles supérieures et de l'enseignement supérieur privé
1 rue Descartes
75231 Paris Cedex 05
greffe-cti@education.gouv.fr

If requested, hard copies of the self-assessment report should be provided to the members of the audit team.

In order to facilitate the process, the self-assessment report structure should be in accordance with **CTI accreditation standards [cf. section 2].**

LIST OF ANNEXES TO THE SELF-ASSESSMENT REPORT

Organisation and partnerships

* Institution statutes
* Organizational chart
* Curricula vitae of the members of the management team
* Curricula vitae of permanent and visiting teaching staff
* Partnership conventions/agreements in place
* Information on international networks in which the programme participates
* Other relevant documents

Programme

* Academic regulations (Regulations for the organization of the programme and the rights and obligations of students)
* Description of the educational objectives and intended programme outcomes, curriculum and module description (work load, teaching methods, syllabus content, assessment methods)
* Internship charters and other relevant academic documents
* Statistics and figures on recruitment and programme outcomes (see list of quantitative data)
* Brochures and other promotional and communication materials
* Examples of degree certificates and diploma supplements
* Other relevant documents

Quality assurance

* Reports of internal quality evaluations
* Reports of external quality assurance reviews (if not carried out by CTI)
* Description of the quality management system and structure
* Other relevant documents

QUANTITATIVE DATA TO BE PROVIDED (NON-EXHAUSTIVE LIST)

Enough quantitative data should be provided by the HEI so as to enable CTI to have a clear picture of the programme for accreditation. CTI and the HEI should agree on a list of quantitative information which is appropriate to the specific context and relevance to the programme under accreditation.

The following section presents a sample list of quantitative information generally requested by CTI:

Higher education institution information

* Legal name
* Commercial name (if relevant)
* Acronym (If relevant)
* Date of establishment
* Official status (public, private)
* Address
* Name of the director/president/rector
* Telephone number
* E-mail address
* Internet site
* Number of students
  ** Students enrolled in master programmes in the different speciality domains covered by the institution
  ** Students enrolled in bachelor programmes in the different speciality domains covered by the institution
  ** Other students (not enrolled in a master or bachelor programme)

* Number of permanent teaching and research staff
* Number of visiting scholars
* Number of visiting teaching staff coming from the professional world
* Number of permanent administrative and services staff
* General budget
* Other relevant information

Programme information

* Title of the programme
* Engineering branch **(see provided list) [cf. Annex]**
* Address of the site in which the programme is delivered
* Tuition fees
* Number of graduates in last graduation year (including males and females; number of handicapped students)
* Duration of the engineering degree programme in years (including average total study period of those who graduated during the last graduation year)
* Other relevant information

Recruitment data

* Number of students recruited in the programme over the last academic year (by nationality)
* Data on recruitment selection (number of students recruited/ number of applicants)
* Other relevant information

Research environment

* Number of researchers working in the HEI's laboratories
* Number of PhD students being tutored at the HEI (by discipline)
* Number of PhD theses presented during the last year
* Research budget
* Other relevant information

Innovation / knowledge transfer

* Number of patents granted to students of teaching staff of the programme/ institution
* Number of graduates who have created their own company over the last five years
* Other relevant information

Links with employers

* Number of employers who are members of the management team for the programme
* Teaching hours being provided by visiting lecturers coming from the professional world
* Hours spent by a graduate of the programme conducting practical work/projects within a company (average hours spent by students who graduated during the last graduation year)
* Number of compulsory weeks dedicated to industry internships
* Continuous and vocational education budget
* Other relevant information

International student mobility

* Outbound mobility: Number of students who have followed study periods or industry internships abroad (students who graduated during the last graduation year) during one semester, two semesters, more (specify hosting countries)
* Inbound mobility: Number of international students on the engineering programme during the last academic year (specify countries of origin)
* Other relevant information

Employment information

* Employability data: Number of graduates who found a job in a certain period of time e.g. within six months, one year etc., country in which they exercised their profession etc. Specify information and data on job status and type of contract (permanent, temporary, etc.)
* Number of graduates who continued to PhD studies.
* Average graduate salary
* Other relevant information

Student life

* Extent of accommodation facilities on campus
* Extent of recreation facilities on campus
* Number of student associations
* Number of members of the alumni association
* Number and type of academic distinctions (prizes, medals, etc.)
* Other relevant information

3.3. DOCUMENTS AND PROCEDURES FOR THE ON-SITE VISIT

BASIC COMPONENTS OF AN ON-SITE VISIT

Depending on the number of programmes to be evaluated and the size of the institution, the visit could last from one single day to a whole week.

The working language during the visit can be French or English. In the case of higher education institutions in non-French and non-English speaking countries, an interpreter provided by the higher education institution should be present during the visit.

In any case, the visit should have the following components:

Preparatory meeting

Before the beginning of the actual site visit, members of the audit team hold a private meeting in order to exchange views on the self-assessment report and to prepare for the visit.

Discussion with the programme management team and the HEI directorate

Some important issues to be discussed include: strategy and management of the programme (resources, quality management, transparency, communication, competence profile and recruitment…), degree of autonomy of the programme management team, overall organization.

Discussion with the academic management staff (department directors, course coordinators, etc.)

Some important issues to be discussed include: organization of the curriculum, coordination mechanisms and assessment tools, teaching initiatives and tools.

Discussion with the teaching staff

Some important issues to be discussed include: implementation of the programme (courses and other teaching activities), organization, career development opportunities, internal communication and motivation of teaching staff, teaching staff participation in the management and quality improvement of the programme, teaching staff satisfaction.

Discussion with students at various stages in their studies

Some important issues to be discussed include: overall organization of the curriculum (work load, course content, and examinations), student profile and motivation, student life, diversity and equal opportunities, student participation in the management and quality improvement of the programme, student satisfaction.

Discussion with administration and services staff

Some important issues to be discussed include: general organization, internal communication and motivation of administration and services staff, career development opportunities, staff participation in the management and quality improvement of the programme, staff satisfaction.

Examination of documentation (final year projects, examinations, coordination and other meeting minutes, etc.)

These documents should provide evidence of the achievement by students of the final programme outcomes, and of the actual functioning of the programme.

Discussion with alumni

Some important issues to be discussed include: graduate profile, employability opportunities and career development, existence of an active alumni network, alumni participation in the development and quality improvement of the programme, alumni satisfaction.

Discussion with employers' representatives

Some important issues to be discussed include: graduate profile, employability opportunities and career development, employers' satisfaction, employers' participation in the development and quality improvement of the programme.

Visit to the facilities and equipment

Internal discussion by the audit team

Concluding discussion with the management team of the programme

The audit team summarize their impressions.

DOCUMENTS TO BE PRESENTED DURING THE ON-SITE VISIT

The presence of certain documents is requested in order to provide evidence of achievement by students of the final programme outcomes and of the actual functioning of the programme. This section provides a non-exhaustive list of documents that are usually requested during site visits:

Organization

* Minutes of the key organization meetings (management, coordination, quality management meetings)
* Financial documents, balance sheets
* Contracts with partners

Programme

* Academic regulations
* Leaflets and promotional material
* Evidence of the achievement by students of the programme outcomes: examples of final year projects, examinations, internship reports

Quality assurance

* Stakeholder surveys (especially student surveys)
* Employability analysis
* Quality manual, process description, minutes of quality assurance coordination meetings.

The accreditation team may request other documents which are judged necessary throughout the visit.

Aerospace, Aeronautical Engineering

Agricultural, Forest, Biosystems Engineering

Architectural Engineering

Bioengineering, Food and Biomedical Engineering

Biological Engineering

Ceramic Engineering

Chemical, Biochemical, and Biomolecular Engineering

Civil Engineering

Computer Engineering

Construction Engineering

Electrical and Electronics Engineering

ANNEX

LIST OF ENGINEERING BRANCHES (OECD, ABET)

Electromechanical Engineering

Engineering Management

Engineering Mechanics

Environmental Engineering

General Engineering, Engineering Physics and Engineering Science

Geological Engineering

Industrial Engineering

Information Systems Engineering

Manufacturing Engineering

Materials, Metallurgical, Polymer Engineering

Mechanical Engineering

Mining Engineering

Naval Architecture and Marine Engineering

Nuclear and Radiological Engineering

Ocean Engineering

Optics and Photonics Engineering

Petroleum Engineering

Software Engineering

Surveying Engineering

Systems Engineering

Telecommunications Engineering

Others