

**Criteria for Accrediting
Japanese Engineering Education Programs
Leading to Master's Degree**

Applicable in the year 2008

The original text of "Criteria for Accrediting Japanese Engineering Education Programs Leading to Master's Degree" is written in Japanese. This is an English translation of the original text.

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Criteria for Accrediting Japanese Engineering Education Programs Leading to Master's Degree

Applicable in the year 2008

These criteria are hereby stipulated for the accreditation of advanced engineering education programs in Master's degree, or equivalent courses (hereafter referred to as "Master's programs") provided by graduate schools and comprise the equivalent of 62 or more credit units at institutions of higher education in Japan. A program seeking accreditation must provide explanations together with supporting materials demonstrating that the program meets all of the following Criteria 1-5 (including those contained in the "Supplement: Program criteria by field" if applicable).

"Engineers" here refers to engineering professionals as widely defined. (including those to be engaged in architectural, computing and research and development works).

Criterion 1: Establishment and Disclosure of Learning and Educational Objectives

- (1) For the purpose of fostering highly skilled engineers being aware of their social responsibility and capable of contributing to the welfare of human beings within local and global context, the program must establish its own specific learning and educational objectives that are more advanced than those of Bachelor's degree programs and incorporate the knowledge and abilities described in items (i) - (v) below. The learning and educational objectives must be disclosed widely on and off campus and must be known to the faculty members and students involved in the program.
 - (i) Deeper knowledge of the fundamental principles and methodologies of relevant engineering fields and an ability to apply this knowledge to the

- solution of engineering problems.
- (ii) Comprehensive knowledge and awareness of disciplinary and interdisciplinary problems relevant to engineering practice.
 - (iii) An ability to analyze engineering problems and to identify and solve problems.
 - (iv) An ability to conduct documentary and field surveys, to set hypotheses, and to verify the hypotheses.
 - (v) Social and personal skills, including communication and leadership ability.
- (2) The learning and educational objectives must be established, giving due consideration to each institution's traditions and resources, to the specific fields in which its graduates are particularly active, and to social needs and students' requirements.

Criteria 2: Educational Methods

2.1 Admission and Enrollment

- (1) The program must establish specific procedures to enroll students (in principle those holding a Bachelor's degree) with adequate qualifications and resources as required to achieve the learning and educational objectives. These procedures must be disclosed on and off campus. The selection process of the students must be in accordance with these procedures.
- (2) In the case where students with adequate qualifications and resources as required to achieve the learning and educational objectives who have been enrolled in other courses at the program's graduate school are transferred in the program, the program must establish specific procedures for selecting students for admission to the program. The procedures must be disclosed on and off campus. The selection of such transfer students must be in accordance with these procedures.
- (3) In the case where students with adequate qualifications and resources as required to achieve the learning and educational objectives who have been

enrolled in a graduate school at other institution are transferred in the program, the program must establish specific procedures for selecting students for admission to the program. The procedures must be disclosed on and off campus. The selection of such transfer students must be in accordance with these procedures.

2.2 Educational Methods

- (1) The program's curriculum must be designed to ensure that students achieve the program's learning and educational objectives. Moreover, the curriculum must be disclosed to the faculty members and students involved in the program. The corresponding relationship between each subject and the program's learning and educational objectives must clearly be shown in the curriculum.
- (2) A syllabus must be prepared for each subject based on the curriculum design and must be displayed to the faculty members and students involved in the program. Educational activities must be implemented in accordance with the syllabus. The syllabus for each subject must clearly indicate how each subject is positioned within the curriculum, and must also indicate the educational content and methods, student workload, the objectives to be achieved, as well as the methods and criteria for evaluating students' achievements.
- (3) The program must establish a system that enhances students' understanding of class work and other program content, promoting students' enthusiasm to learn, while coping with students' requests. The structures of this system must be displayed to the faculty members and students involved in the program, and the necessary activities must be implemented.
- (4) The students must be allowed to regularly assess their own level of achievement against the program's learning and educational objectives, for motivation and orientation in their own study.

2.3 Educational Organization

- (1) The program must provide sufficient numbers of eligible faculty, coupled with an educational support system, enough to deploy the curriculum which ensures that the student achieves the learning and educational objectives by means of appropriate educational methods.
- (2) The program must establish a faculty development system designed to improve the quality of the faculty, and display it to the faculty members involved in the program. The necessary activities must be implemented.
- (3) The program must establish an evaluation method to determine the educational contributions of each faculty member and display it to the faculty members involved in the program. The evaluation of educational contributions must be implemented in accordance with the method.
- (4) The program must establish an intra-faculty liaison network system to ensure closer coordination among the subjects within the curriculum, while enhancing and improving the effectiveness of the program. The program must implement activities relevant to such a system.

Criterion 3: Educational Environment

3.1 Facilities and Equipment

- (1) The program must have sufficient classrooms, laboratories, practice rooms, libraries, information technology facilities, study rooms, rest areas, cafeterias, and other relevant facilities and equipment as required for achieving the program's learning and educational objectives.

3.2 Financial Resources

- (1) The program must endeavour to secure adequate financial resources to

provide, maintain and operate the facilities and equipment as needed to achieve the program's learning and educational objectives.

3.3 Student Support System

- (1) Concerning the educational environment, the program must provide a system that promotes students' enthusiasm to learn while taking students' requests into account, and display the system to the faculty members, office staff and students involved in the program. The necessary activities must be implemented.

Criterion 4: Evaluation of Students' Level of Achievement against the Learning and Educational Objectives

- (1) The program must evaluate students' level of achievement against the objectives for each subject in accordance with the evaluation methods and criteria described in the syllabi.
- (2) The program must provide criteria and methods to count on any credit unit earned through study outside the program, and such credit units must be converted according to these criteria and methods. The following cases are supposed:
 - i) A student, while in school, earned a credit unit through study in classes provided by other graduate school.
 - ii) A student, before he or she enrolled in the program, had earned a credit unit through study in classes provided by the same graduate school or by other graduate school.
- (3) The program must establish methods and criteria for comprehensively evaluating the level of students' achievement against each learning and educational objective of the program. The evaluations must be done according to such methods and criteria.

- (4) All graduates of the program must have achieved all of the program's learning and educational objectives.

Criterion 5: Educational Improvement

5.1 Educational Feedback System

- (1) The program must provide an educational feedback system that examines the program in accordance with Criteria 1 – 4 taking into account the results of evaluation regarding the level of student achievement against the learning and educational objectives. Also the program must display the system to the faculty members involved in the program. The necessary activities must be implemented.
- (2) The educational feedback system must be in place and actually operated taking societal needs and students' requests in account. The system should comprise a self inspection mechanism to be able to review own function.
- (3) The records of the activities such as meetings and committees, etc comprising the educational feedback system must be offered for viewing by the faculty members involved in the program.

5.2 Continuous Improvement

- (1) The program must provide a system that continuously improves the program in compliance with these Criteria making the most of the educational feedback system. The necessary activities must be implemented.

Supplement: Program Criteria by Field

Program Criteria by Field provide supplementary guidelines for applying this Accreditation Criteria to a program in a specific field. Program Criteria by Field shall primarily address matters regarding the learning and educational objectives [i.e. Criterion 1 (1)], and the faculty [i.e. Criterion 2.3 (1), etc.].

Program Criteria by Field for
Specialized Field “Architectural Design and Planning”
in Architecture and Building Engineering

These Program Criteria by Field apply to engineering programs in a specialized field, “Architectural Design and Planning,” of Architecture and Building Engineering.

1. Knowledge and abilities to be defined in “Learning and Educational Objectives”

Those who are engaged in Architectural Design and Planning are required to contribute to assure functionality, security, amenity, and artistic and social value of buildings. As well as they must understand that their work resides on academic, artistic and engineering factors, and is organically involved with a broad array of fields in Architecture and Building Engineering. They should have knowledge and abilities to comprehensively contribute to design, planning, construction, maintenance and conservation of buildings.

A program in a specialized field, “Architecture Design and Planning” of Architecture and Building Engineering must develop and disclose definitive learning and educational objectives in the light of above mentioned knowledge and abilities. The learning and educational objectives must consist of practical knowledge and abilities as itemized in 2. (1)-(11) below. The program should give their students opportunities to actually practice items in 2. (1)-(11).

2. Practical Knowledge and abilities

- (1) An architectural design ability to satisfy both aesthetic and various technical requirements.
- (2) An adequate knowledge of the history and theories of architecture and the related fine arts, engineering, and human sciences as influence on the quality of architectural design.
- (3) An adequate knowledge of urban design, planning and their processes.
- (4) An understanding of the relationship between people and buildings, between buildings and spaces of surrounding environment, and an ability to give appropriate quality and quantities to such elements.
- (5) An understanding of the profession of architectural design and planning and the role of the profession in the society.
- (6) Understanding of the fundamental methods of investigation, structural design, construction techniques and other problems associated with building design.
- (7) An adequate knowledge of building performance and technologies, so as

- to provide comfort and safety to the interior environment.
- (8) An adequate knowledge of industries, organizations, regulations and procedures involved in translating design concepts, to synthesize the overall design and to manage construction budget by coordinating allied industries, cost factors and legal constraints.
 - (9) An Adequate knowledge of the means of achieving ecologically sustainable design and environmental conservation and rehabilitation.
 - (10) Development of a creative competence in building techniques, founded on a comprehensive understanding of the disciplines and construction methods related to architecture.
 - (11) Training in research techniques as an inherent part of architectural learning, for both students and teachers.

**Nos. 9, 10, 11 are identical to “V.3.2.2 Special points to be considered: Items 2, 3 and 5, “UNESCO-UIA Validation System for Architectural Education”.

3. Faculty

An individual faculty member as well as the faculty as a team must possess sufficient ideal, knowledge, skills as well as practical abilities to provide a comprehensive education to achieve the program's Learning and Educational objectives. It is desirable to include those who are practicing architects in close contact with professional practice.

Refer to: Architectural Institute of Japan <http://www.aij.or.jp/jpn/aijedu/aijedu.htm>