JABEE Category-dependent Criteria for Accreditation of Professional Education Programs

Applicable in the years 2012 -

(revised as at 26 December 2016)

Only the Japanese version of “JABEE Category-dependent Criteria for Accreditation of Professional Education Programs applicable in the years 2012 - ” is official.

English translation is for informational purpose.

JABEE

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Chapter 1 Purpose

Category-dependent Criteria defines items necessary for evaluation and accreditation to be conducted with JABEE Common Criteria.

Chapter 2 Definition of Terminology

1. “Mandatory Item” defined in this documents are addendum to Common Criteria 2.1(1) for each category of accreditation. A program seeking accreditation of that category shall satisfy the addendum for the category in addition to the chapters in Common Criteria.
2. “Items to be Considered” defined in Chapter 4 of Category-dependent Criteria provide perspective on each chapter on Common Criteria for each Category of Accreditation and shall be the elements for holistic judgment.

Chapter 3 Mandatory Items for Application of Criteria

“Mandatory Items” for each category of accreditation are defined in the appendices 1 to 4 below:

1. Appendix 1-1
   for Engineering Education Programs at Bachelor Level ,
2. Appendix 2-1
   for Engineering Education Programs at Master Level ,
3. Appendix 3-1
   for Computing & IT-related Education programs at Bachelor Level,
4. Appendix 4-1
   for Architectural and Architectural Engineering Education Programs at Bachelor and Master Level.

Chapter 4 Items to be Considered for Application of Criteria

“Items to be Considered” by each Category of Accreditation are defined in the appendices (1) to (4) below:

1. Appendix 1-2
   for Engineering Education Programs at Bachelor Level,
2. Appendix 2-2
   for Engineering Education Programs at Master Level,

3. Appendix 3-2
   for Computing & IT-related Education programs at Bachelor Level,
4. Appendix 4-2
   for Architectural and Architectural Engineering Education Programs at Bachelor and Master Level.

Chapter 5 Items to be Considered by Field

"Items to be Considered" by each field of accreditation are defined in the appendices below:

1. Items to be Considered for Engineering Education Programs at Bachelor Level are defined in appendices below:

Appendix 1-3-1	Field for Chemical and Chemistry-Related Engineering
Appendix 1-3-2	Field for Mechanical Engineering
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2. Items to be Considered for Engineering Education Programs at Master Level shall not be defined.

3. Computing & IT-related Education Programs at Bachelor Level are defined in appendices below:

Appendix 3-3-1	Field for Computer Science

Appendix 3-3-2 Field for Information Systems

Appendix 3-3-3 Field for Information Technology

Appendix 3-3-4 Field for Computing General

4. Architectural and Architectural Engineering Education Programs at Bachelor and Master Level are defined in appendix below:

Appendix4-3-1 Field for Architectural Design and Planning

Appendix 1-1 Mandatory Items for Engineering Education Programs at Bachelor Level

Related Criterion	Mandatory Items
Criterion 2.1(1)	The curriculum of the program shall be designed for four-year duration of learning and education and more than 60% of the curriculum shall be formed by mathematics, natural sciences and engineering sciences appropriate to the field.

Appendix 1-2 Items to be Considered for Engineering Education Programs at Bachelor Level

Related Criterion	Items to be Considered
Criterion 1(2)(a)	The learning outcomes in terms of "(a) An ability of multidimensional thinking with knowledge from global perspective" shall be established by taking account of the following items.
	・Knowledge of diverse culture and society of mankind as well as nature ・An ability to take action appropriately based on the mentioned above
Criterion 1(2)(b)	The learning outcomes in terms of "(b) An ability of understanding of effects and impact of professional activities on society and nature, and of professionals' social responsibility" shall be established by taking account of the following items.
	・Understanding of impact of technology of related engineering fields on public welfare ・Understanding of implication of technology of related engineering fields on environmental safety and sustainable development of society ・Understanding of engineering ethics ・An ability to take action based on the understanding mentioned above
Criterion 1(2)(c)	The learning outcomes in terms of "(c) Knowledge of and ability to apply mathematics and natural sciences" shall be established by taking account of the following items.
	・Knowledge of mathematics and natural sciences required in the related engineering fields ・An ability to apply including combining the knowledge mentioned above
Criterion 1(2)(d)	The learning outcomes in terms of "(d) knowledge of the related professional fields, and ability to apply" shall be established by taking account of the following items.
	・Knowledge of the related engineering fields ・An ability to apply including combining the knowledge mentioned above ・An ability to utilize hardware and software required in the related

	engineering fields
Criterion 1(2)(e)	The learning outcomes in terms of “(e) Design ability to respond to requirements of the society by utilizing various sciences, technologies and information” shall be established by taking account of the following items.
	・An ability to recognize problems to be solved ・An ability to specify constraints from public welfare, environmental safety, and economy to be taking account of ・An ability to logically specify, organize, and analyze problems to be solved ・An ability to plan detailed policies toward problem-solving by taking account of various constraints and applying systematic knowledge of mathematics, natural sciences and engineering sciences in the related engineering fields ・An ability to actually solve problems in accordance with the policies as planned
Criterion 1(2)(f)	The learning outcomes in terms of “(f) Communication skills including logical writing, presentation and debating” shall be established by taking account of the following items.
	・An ability to deliver information and opinion to the others ・An ability to understand information and opinion delivered by others ・An ability to exchange information and opinion by utilizing foreign languages such as English
Criterion 1(2)(g)	The learning outcomes in terms of “(g) An ability of independent and life-long learning” shall be established by taking account of the following items.
	・Understanding of necessity of continuous professional development to perform as a life-long engineer ・An ability to acquire necessary information and knowledge
Criterion 1(2)(h)	The learning outcomes in terms of “(h) An ability to manage and accomplish tasks systematically under given constraints” shall be established by taking account of the following items.
	・An ability to accomplish tasks systematically under given constraints including time and cost ・An ability to grasp the progress of the plan and modify it as required
Criterion 1(2)(i)	The learning outcomes in terms of “(i) An ability to work in a team” shall be established by taking account of the following items.
	・An ability to precisely judge and conduct own work during collaborative work ・An ability to appropriately judge what others should do and to address to others during collaborative work

Appendix 1-3-1 Items to be Considered for Chemical and Chemistry-Related Engineering at Bachelor Level

Name of Field	Specific Items of Related Criterion	Items to be Considered by Field
Chemical and Chemistry-Related Engineering	Criterion1(2)(d)	The following shall be considered as “knowledge of the related professional fields, and ability to apply including benchmark”.
		Based on the “expected knowledge and ability for problem solving in mathematics and natural science” to be acquired as expected in criterion 1 (2) (c), each education program shall be organized into the following four-hierarchy structure: (1) Engineering fundamentals, (2) chemical engineering fundamentals, (3) chemical and chemistry-related field fundamentals, (4) specializing fields. Educational content or knowledge of the field in each hierarchical structure is indicated as follows. It is a legitimate right for a program to name the title of the subjects according to its own judgment and not necessarily all the titles of subjects be required. It is also allowed to have one subject divided into the above mentioned (1) to (4). The distribution of course hours in each hierarchy is also a legitimate right for a program to determine according to its own judgment within the range of being able to assure knowledge and abilities of the graduates. (1) Engineering Fundamentals Knowledge of engineering fundamentals and ability to apply it for problem solving, including such as applied (industrial) mathematics, applied statistics, (experimental design, quality management), applied physics (mathematical physics, nuclear physics), information-processing, electrical engineering, materials science, materials mechanism and fluid mechanics. (2) Chemical Engineering Fundamentals Knowledge of chemical engineering fundamentals and ability to apply it for problem solving, including such as stoichiometry including mass/energy balance, industrial thermodynamics including phase/chemical equilibrium,

		heat/mass/momentum transport phenomena, flow calculation, equipment design, control and project management. (3) Fundamentals of the Field Knowledge, experimental skills of professional fundamentals and ability to apply them for problem solving, in more than four areas of the chemical and chemistry-related fields namely: organic chemistry, inorganic chemistry, physical chemistry, analytical chemistry, polymer chemistry, materials chemistry, electrochemistry, photochemistry, interface chemistry, environmental chemistry, pharmaceutical chemistry, biochemistry, molecular biology, energy chemistry, separation engineering, chemical reaction engineering, process system engineering, molecular chemical engineering, bioengineering. (4) Specializing fields Knowledge in specializing on more than one fields selected from (3)above, and profession knowledge and ability to apply, design and manage them for problem solving, taking into account the influence on economic, safety, reliability and impacts on society and environment.
	Criterion 2.1(1)	The following shall be considered as “educational components of mathematics, natural sciences and technologies” appropriate to the field.
		“Knowledge of mathematics, natural sciences and technologies” expected in criterion 1 (2) (c) include knowledge and abilities to apply linear algebras, mathematical analysis, theory of differential equation, theory of lumped/distributed parameter system, mechanics, electromagnetic, quantum mechanics, geoscience, bioscience, biological science and statistics. Chemical and chemistry-related educational components shall be included in hierarchical structure of program criteria criterion 1 (2) (d).
	Criterion 2.3(1)	The following shall be considered as “to provide a sufficient number of faculty members able to realize the curriculum with applicable educational methods and to improve the educational result of the program, and shall provide the faculty with institutional support.”

		Faculty shall include either members who have qualifications such as licenses of professional engineer or members who have ability to teach practice relating to educational components.

Appendix 1-3-2 Items to be Considered for Mechanical Engineering at Bachelor Level

Name of Field	Specific Items of Related Criterion	Items to be Considered by Field
Mechanical Engineering	Criterion 1(2)(d)	The following shall be considered as “knowledge of the related professional fields, and ability to apply including benchmark”.
		Knowledge of fundamental subjects of Mechanical Engineering such as, materials and structure, dynamics and vibration, energy and fluid flow, information and measurement & control, design and manufacture & management, and ability to apply them to solve problems.
	Criterion 2.1(1)	The following shall be considered as “educational components of mathematics, natural sciences and technologies” appropriate to the field.
		Educational contents to foster students with fundamental abilities to be an engineer, the profile of which is defined by education program.
	Criterion 2.3(1)	No additional Items to be Considered.

Appendix 1-3-3 Items to be Considered for Materials and Metallurgical Engineering at Bachelor Level

Name of Field	Specific Items of Related Criterion	Items to be Considered by Field
Materials and Metallurgical Engineering	Criterion 1(2)(d)	The following shall be considered as “knowledge of the related professional fields, and ability to apply including benchmark”.
		Graduates are required to acquire the following abilities at the time of completion of the program: (1) Understanding fundamentals of material structure and characteristics, (2) Understanding fundamentals of process of materials, (3) Understanding fundamentals of function, design and utilization of materials, (4) An ability to plan and implement experiment

		and to analyze data.
	Criterion 2.1(1)	The following shall be considered as “educational components of mathematics, natural sciences and technologies” appropriate to the field.
		Course hours of educational contents (1), (2), (3) mentioned above shall be more than one forth of these total by each, and course hours of (4) shall be more than half of total of (1), (2), (3).
	Criterion 2.3(1)	The following shall be considered as “to provide a sufficient number of faculty members able to realize the curriculum with applicable educational methods and to improve the educational result of the program, and shall provide the faculty with institutional support.”
		Faculty shall be composed with members who have ability to teach educational components relating to the fields that is expected to be achieved as the learning outcomes of the program.

Appendix 1-3-4 Items to be Considered for Resources and Geological Engineering at Bachelor Level

Name of Field	Specific Items of Related Criterion	Items to be Considered by Field
Resources and Geological Engineering	Criterion 1(2)(d)	No additional Items to be Considered in Appendix 1-2.
	Criterion 2.1(1)	The following shall be considered as “educational components of mathematics, natural sciences and technologies” appropriate to the field.
		(1) Applied mathematics (2) Natural sciences (Include fundamentals of geoscience or geography/geology) (3) Fundamentals of the field of at least of the following area of Resources and Geological field or integrated areas of these 1) Investigation of geosphere and disaster mitigation 2) Resource development and manufacturing 3) Resource circulation and environment (4) Exercise, experiment, and fieldwork to foster an ability to search and solve problems by

		applying applied mathematics, natural sciences, and fundamentals of the field on specific issues of Resources and Geological field
	Criterion 2.3(1)	The following shall be considered as “to provide a sufficient number of faculty members able to realize the curriculum with applicable educational methods and to improve the educational result of the program, and shall provide the faculty with institutional support.”
		Faculty, including part time staff, shall include either who have qualification such as license of professional engineer or who have ability to teach practice relating to educational components.

Appendix 1-3-5 Items to be Considered for Communication, Computer, Software, and similarly named Engineering at Bachelor Level

Name of Field	Specific Items of Related Criterion	Items to be Considered by Field
Communication, Computer, Software, and similarly named Engineering	Criterion 1(2)(d)	No additional Items to be Considered in Appendix 1-2.
	Criterion 2.1(1)	The following shall be considered as “educational components of mathematics, natural sciences and technologies” appropriate to the field.
		(1) Knowledge and abilities to apply circuit theory, information theory, and communication theory or combination of those for the engineering education program which includes either “electronic”, “information”, or “communication” within the title of the program (2) Knowledge and abilities to apply logic circuit, information theory, and data structure or combination of those for the engineering education program which includes either “computer” or “software” within the title of the program (3) Knowledge required for expected learning outcomes of the applicable hardware or software to the program, or complex system composed by both of them (4) An ability to plan and execute experiment of hardware and software to be complied with the

		learning outcomes of the program, to acquire and analyze data accurately, and to examine from engineering perspective and to explain the results
	Criterion 2.3(1)	No Items to be Considered for Common Criteria.

Appendix 1-3-6 Items to be Considered for Electrical, Electronic and similarly named Engineering at Bachelor Level

Name of Field	Specific Items of Related Criterion	Items to be Considered by Field
Electrical, Electronic and similarly named Engineering	Criterion 1(2)(d)	No additional Items to be Considered in Appendix 1-2.
	Criterion 2.1(1)	The following shall be considered as “educational components of mathematics, natural sciences and technologies” appropriate to the field.
		(1) Knowledge required to analyze and to design complex electrical / electronic devices or systems including hardware and software (2) An ability to plan and execute experiment to be complied with the learning outcomes of the program, to analyze data accurately, and to examine from engineering perspective and to explain the results
	Criterion 2.3(1)	No Items to be Considered for Common Criteria.

Appendix 1-3-7 Items to be Considered for Civil Engineering at Bachelor Level

Name of Field	Specific Items of Related Criterion	Items to be Considered by Field
Civil Engineering	Criterion 1(2)(d)	No additional Items to be Considered in Appendix 1-2.
	Criterion 2.1(1)	The following shall be considered as “educational components of mathematics, natural sciences and technologies” appropriate to the field.
		(1) Applied Mathematics (2) Natural Sciences (at least one from physics, chemistry, biology and geometry) (3) At least three out of principle areas of civil engineering field: civil engineering material & construction management/ structural engineering & earthquake engineering &

		maintenance management engineering/ geotechnique/ hydraulic engineering/ civil engineering planning & traffic engineering and civil environmental system
	Criterion 2.3(1)	The following shall be considered as “to provide a sufficient number of faculty members able to realize the curriculum with applicable educational methods and to improve the educational result of the program, and shall provide the faculty with institutional support.”
		Faculty shall include either members who have qualification such as license of professional engineer or engineer accredited by the Japan Society of Civil Engineers, or members who have qualification to teach subjects through experience in engineering practice.

Appendix 1-3-8 Items to be Considered for Agricultural Engineering at Bachelor Level

Name of Field	Specific Items of Related Criterion	Items to be Considered by Field
Agricultural Engineering	Criterion 1(2)(d)	No additional Items to be Considered in Appendix 1-2.
	Criterion 2.1(1)	The following shall be considered as “educational components of mathematics, natural sciences and technologies” appropriate to the field.
		Educational contents shall include systematic subject clusters related with mathematics and natural sciences (focusing on multiple subjects such as, physics, chemistry, biology, or geography), and area of irrigation, drainage and reclamation engineering (agricultural civil engineering), and area of agro-environment (agricultural meteorology & biological environment, biological production system & provisions system, information of agriculture & information of biological environment, agricultural machinery & agricultural work system), or the integration of these areas.
	Criterion 2.3(1)	The following shall be considered as “to provide a sufficient number of faculty members able to realize the curriculum with applicable educational methods and to improve the educational result of

		the program, and shall provide the faculty with institutional support.”
		Faculty, including part time staff, shall include either members who have qualification such as license of professional engineer or members who have ability to teach practice relating to educational components.

Appendix 1-3-9 Items to be Considered for Multi- and/or Trans-disciplinary Engineering, and New-disciplinary Engineering at Bachelor Level

Name of Field	Specific Items of Related Criterion	Items to be Considered by Field
Multi- and/or Trans-disciplinary Engineering, and New-disciplinary Engineering	Criterion 1(2)(d)	The following shall be considered as “knowledge of the related professional fields, and ability to apply including benchmark”.
		(1) Knowledge and abilities of engineering field (Contents of the specific field of Multi- and/or Trans-disciplinary Engineering and New-disciplinary Engineering shall be stipulated by the higher education institution applying for program evaluation) (2) An ability to plan and execute experiment by utilizing fundamental knowledge and technologies of several fields of engineering, to analyze and examine data accurately from engineering perspective and to explain the result (3) An ability to integrate fundamental knowledge and technologies applicable to the field, to research issues, to build and to solve with creativity (4) Fundamental ability to understand problems and issues appropriately that engineers experience during engineering practice and to solve them appropriately
	Criterion 2.1(1)	The following shall be considered as “educational components of mathematics, natural sciences and technologies” appropriate to the field.
		At least one subject from each cluster subject in total of more than six subjects shall be included as fundamental engineering. The five cluster subjects of fundamental engineering are namely, (i) design

		& system, (ii) information & logic, (iii) material & biology, (iv) dynamic and (v) socio-technical
	Criterion 2.3(1)	The following shall be considered as “to provide a sufficient number of faculty members able to realize the curriculum with applicable educational methods and to improve the educational result of the program, and shall provide the faculty with institutional support.”
		Faculty shall include either members who have qualification such as license of professional engineer or members who have ability to teach practice relating to educational components.

Appendix 1-3-10 Items to be Considered for Architecture and Building Engineering at Bachelor Level

Name of Field	Specific Items of Related Criterion	Items to be Considered by Field
Architecture and Building Engineering	Criterion 1(2)(d)	The following shall be considered as “knowledge of the related professional fields, and ability to apply including benchmark”.
		A program shall be established including following the learning outcomes and an ability to perform, understand, knowledge, and experiences of practice expected by “UNESCO/UIA Charter for Architectural Education” shall be disclosed. (1) Ability to create architectural designs that satisfy both aesthetic and technical requirements (2) Adequate knowledge of the history and theories of architecture and the related arts, technologies and human sciences (3) Knowledge of the fine arts as an influence on the quality of architectural design (4) Adequate knowledge of urban design, planning and the skills involved in the planning process (5) Understanding of the relationship between people and buildings, and between buildings and their environment, and of the need to relate buildings and the spaces between them to human needs and scale (6) Understanding of the profession of

		architecture and the role of the architect in society, in particular in preparing briefs that take account of social factors (7) Understanding of the methods of investigation and preparation of the brief for a design project (8) Understanding of the structural design, construction and engineering problems associated with building design (9) Adequate knowledge of physical problems and technologies and of the function of buildings so as to provide them with internal conditions of comfort and protection against the climate (10) Design skills necessary to meet building users' requirements within the constraints imposed by cost factors and building regulations (11) Adequate knowledge of the industries, organizations, regulations and procedures involved in translating design concepts into buildings and integrating plans into overall planning (12) Awareness of responsibilities toward human, social, cultural, urban, architectural, and environmental values, as well as architectural heritage (13) Adequate knowledge of the means of achieving ecologically responsible design and environmental conservation and rehabilitation (14) Development of a creative competence in building techniques, founded on a comprehensive understanding of the disciplines and construction methods related to architecture (15) Adequate knowledge of project financing, project management, cost control and methods of project delivery (16) Training in research techniques as an inherent part of architectural learning, for both students and teachers
	Criterion 2.1(1)	The following shall be considered as "educational components of mathematics, natural sciences and technologies" appropriate to the field.

		Program shall establish course to satisfy requirements of related qualification for taking “class-1 architects” examination as national license of practice.
	Criterion 2.3(1)	No Items to be Considered for Common Criteria.

Appendix 1-3-11 Items to be Considered for Engineering Physics and Applied Physics at Bachelor Level

Name of Field	Specific Items of Related Criterion	Items to be Considered by Field
Engineering Physics and Applied Physics	Criterion 1(2)(d)	The following shall be considered as “knowledge of the related professional fields, and ability to apply including benchmark”.
		Fundamental knowledge of at least one from fundamental physics such as, dynamics, electromagnetic, thermal physics, quantum physics, basic experiment, and at least one of the principle areas of the field such as, physics & applied physics in general, physicality & materials, physical information measurement, electronics & element and an ability to apply these for problem solving.
	Criterion 2.1(1)	The following shall be considered as “educational components of mathematics, natural sciences and technologies” appropriate to the field.
		Mathematics such as, calculus, linear algebras, vector analysis, physical mathematics and fundamentals related with information technology shall be included in the education program.
	Criterion 2.3(1)	No Items to be Considered for Common Criteria.

Appendix 1-3-12 Items to be Considered for Industrial Engineering and Management at Bachelor Level

Name of Field	Specific Items of Related Criterion	Items to be Considered by Field
Industrial Engineering and Management	Criterion 1(2)(d)	The following shall be considered as “knowledge of the related professional fields, and ability to apply including benchmark”.
		(1) Knowledge of management principle and of procedure and its application ability (2) Mathematical analytic ability includes ability to

		plan systematic data collection and to analyze data taking account of probability variation and ability to find most optimal result modeling actual problems to mathematical formula (3) An ability to utilize and apply information technology that is, the ability to utilize and apply information technology
	Criterion 2.1(1)	The following shall be considered as “educational components of mathematics, natural sciences and technologies” appropriate to the field.
		Fundamental knowledge of mathematics, management, economics and other related fields, including fundamental knowledge of interdisciplinary technologies.
	Criterion 2.3(1)	The following shall be considered as “to provide a sufficient number of faculty members able to realize the curriculum with applicable educational methods and to improve the educational result of the program, and shall provide the faculty with institutional support.”
		Faculty shall include members who have ability to teach practice applicable to the field of industrial engineering and management and other related fields.

Appendix 1-3-13 Items to be Considered for Agricultural Science and Engineering at Bachelor Level

Name of Field	Specific Items of Related Criterion	Items to be Considered by Field
Agricultural Science and Engineering	Criterion 1(2)(d)	No additional Items to be Considered in Appendix 1-2.
	Criterion 2.1(1)	The following shall be considered as “educational components of mathematics, natural sciences and technologies” appropriate to the field.
		Theoretical and applicable knowledge of biological science, bioenvironmental science, biological production science and biological resources science.
	Criterion 2.3(1)	The following shall be considered as “to provide a sufficient number of faculty members able to realize the curriculum with applicable educational

		methods and to improve the educational result of the program, and shall provide the faculty with institutional support.”
		Faculty, including part time staff, shall include either members who have qualification such as license of professional engineer or members who is eligible to teach subjects through practical experience relating to the field.

Appendix 1-3-14 Items to be Considered for Forest Engineering at Bachelor Level

Name of Field	Specific Items of Related Criterion	Items to be Considered by Field
Forest Engineering	Criterion 1(2)(d)	No additional Items to be Considered in Appendix 1-2
	Criterion 2.1(1)	The following shall be considered as “educational components of mathematics, natural sciences and technologies” appropriate to the field.
		One of general fundamentals related to forest ecosystem, forest environment, conservation of natural environment, sustainable production and utilization of forest resources and of the field of engineering such as forestry, forest engineering, natural environment, forest product, or of integration of these areas.
	Criterion 2.3(1)	The following shall be considered as “to provide a sufficient number of faculty members able to realize the curriculum with applicable educational methods and to improve the educational result of the program, and shall provide the faculty with institutional support.”
		Faculty, including part time staff, shall include either who have qualification such as license of professional engineer or who is eligible to teach subjects through experience of practice related with the field.

Appendix 1-3-15 Items to be Considered for Environmental Engineering at Bachelor Level

Name of Field	Specific Items of Related Criterion	Items to be Considered by Field
Environmental Engineering	Criterion 1(2)(d)	No additional Items to be Considered in Appendix 1-2.

	Criterion 2.1(1)	The following shall be considered as “educational components of mathematics, natural sciences and technologies” appropriate to the field.
		Applied (industrial) mathematics and at least two subjects from natural sciences mainly focusing on physics, chemistry, biology and geology and one of the following areas applicable to environment or fundamentals of integrated area of those areas (1) Area relating to urban environment and environmental system (2) Area relating to infrastructure and its environment (3) Area relating to residency and living environment (4) Area relating to environment of materials and energy
	Criterion 2.3(1)	The following shall be considered as “to provide a sufficient number of faculty members able to realize the curriculum with applicable educational methods and to improve the educational result of the program, and shall provide the faculty with institutional support.”
		Faculty, including part time staff, shall include either who have qualification such as license of professional engineer or who have ability to teach practice relating to educational components.

Appendix 1-3-16 Items to be Considered for Biochemical, Biological and Biophysical Engineering at Bachelor Level

Name of Field	Specific Items of Related Criterion	Items to be Considered by Field
Biochemical, Biological and Biophysical Engineering	Criterion 1(2)(d)	The following shall be considered as “knowledge of the related professional fields, and ability to apply including benchmark”.
		Knowledge of more than two principle areas from biology, biological information, biochemical, cell engineering, bionics, biochemical engineering and environmental bioengineering or knowledge of combination of those areas, and ability to apply the knowledge to problem solving from engineering perspective namely: (1) Knowledge and technologies of the field,

		(2) Mathematical knowledge related to biological engineering or information processing technology, (3) An ability to plan and execute experiment, to analyze and examine acquired data accurately and to explain the result, (4) An ability to utilize knowledge and technologies applicable to the field, to research, to build and to solve issues, (5) An ability to understand problems and issues in practice and to judge and solve them appropriately.
	Criterion 2.1(1)	No Items to be Considered for Common Criteria and no Mandatory Items in Appendix 1-1.
	Criterion 2.3(1)	Faculty, including part time staff, shall include either who have qualification such as license of professional engineer or who have ability to teach practice relating to educational components.

Appendix 2-1 Mandatory Items for Engineering Education Programs at Master Level

Related Items of Criterion	Items to be Considered
Criterion 2.1(1)	The curriculum of the program shall be designed for two-year duration of learning and education.

Appendix 2-2 Items to be Considered for Engineering Education Programs at Master Level

Related Items of Criterion	Items to be Considered
Criterion 1(2)(a)~(i)	Advanced learning outcomes of the program compare to the engineering education program at bachelor level shall be established to achieve for the Items to be Considered.

Appendix 3-1 Mandatory Items for IT-related Education Programs at Bachelor Level

Related Criterion	Mandatory Items
Criterion 2.1(1)	The curriculum of the program shall be designed for four-year duration of learning and education and more than 60% of the curriculum shall be formed by mathematics, science and technology appropriate to the field.

Appendix 3-2 Items to be Considered for IT-related Education Programs at Bachelor Level

Related Criterion	Items to be Considered
Criterion 1(2)(a)	The learning outcomes in terms of "(a) An ability of multidimensional thinking with knowledge from global perspective" shall be established by taking account of the following items.
	・ Knowledge of diverse culture and society of mankind as well as nature ・ An ability to take action appropriately based on the mentioned above
Criterion 1(2)(b)	The learning outcomes in terms of "(b) An ability of understanding of effects and impact of professional activities on society and nature, and of professionals' social responsibility" shall be established by taking account of the following items.
	・ Understanding of impact of technology of related computing and IT fields on public welfare ・ Understanding of implication of technology of related computing and IT fields on environmental safety and sustainable development of society ・ Understanding of professional ethics ・ Understanding of responsibilities of information security ・ An ability to take action based on the understanding mentioned above
Criterion 1(2)(c)	The learning outcomes in terms of "(c) Knowledge of and ability to apply mathematics and natural sciences" shall be established by taking account of the following items.
	・ Knowledge of mathematics (including discrete mathematics

	and statistics) and natural sciences required in the related computing and IT fields ・ An ability to apply including combining the knowledge mentioned above
Criterion 1(2)(d)	The learning outcomes in terms of “(d) knowledge of the related professional fields, and ability to apply” shall be established by taking account of the following items.
	・ Knowledge of the related computing and IT fields ・ An ability to apply including combining the knowledge mentioned above ・ An ability to utilize hardware and software required in the related computing and IT fields ・ An ability to select, create and apply appropriate techniques and tools to complex computing activities
Criterion 1(2)(e)	The learning outcomes in terms of “(e) Design ability to respond to requirements of the society by utilizing various sciences, technologies and information” shall be established by taking account of the following items.
	・ An ability to recognize problems to be solved ・ An ability to specify constraints from public welfare, environmental safety, and economy to be taking account of ・ An ability to analyze a problem, identify and define the computing requirements applicable to its solution ・ An ability to design, implement and evaluate a computer-based system, process, component, or program to satisfy requirements under various constraints
Criterion 1(2)(f)	The learning outcomes in terms of “(f) Communication skills including logical writing, presentation and debating” shall be established by taking account of the following items.
	・ An ability to deliver information and opinion to the others ・ An ability to understand information and opinion delivered by others ・ An ability to exchange information and opinion by utilizing foreign languages such as English
Criterion 1(2)(g)	The learning outcomes in terms of “(g) An ability of independent

	and life-long learning" shall be established by taking account of the following items.
	・ Understanding of necessity of continuous professional development to perform as a life-long computing and IT-related professionals ・ An ability to acquire necessary information and knowledge
Criterion 1(2)(h)	The learning outcomes in terms of "(h) An ability to manage and accomplish tasks systematically under given constraints" shall be established by taking account of the following items.
	・ An ability to accomplish tasks systematically under given constraints including time and cost ・ An ability to grasp the progress of the plan and modify it as required
Criterion 1(2)(i)	The learning outcomes in terms of "(i) An ability to work in a team" shall be established by taking account of the following items.
	・ An ability to precisely judge and conduct own work during collaborative work ・ An ability to appropriately judge what others should do and to address to others during collaborative work

Appendix 3-3-1 Items to be Considered for Computer Science at Bachelor Level

Name of Field	Specific Items of Related Criterion	Items to be Considered by Field
Computer Science	Criterion 1(2)(d)	The following shall be considered as “knowledge of the related professional fields, and ability to apply including benchmark”.
		(1) An ability to apply mathematical fundamentals, various algorithmic principles, and computer science theories in the modeling and designing computer-based systems (2) An ability to apply principles of design and development to the construction of software systems with complexity.
	Criterion 2.1(1)	No additional Items to be Considered in Common Criteria and Appendix 3-1
	Criterion 2.3(1)	The following shall be considered as “to provide a sufficient number of faculty members able to realize the curriculum with applicable educational methods and to improve the educational result of the program, and shall provide the faculty with institutional support.”
		(1) Faculty shall include multiple full-time members, who have a Ph.D. in computer science or in neighboring disciplines. (2) Faculty shall include sufficient numbers of full-time members, who have experience in providing information processing system made to be used by the third party in premise.

Appendix 3-3-2 Items to be Considered for Information Systems at Bachelor Level

Name of Field	Specific Items of Related Criterion	Items to be Considered by Field
Information Systems	Criterion 1(2)(d)	The following shall be considered as “knowledge of the related professional fields, and ability to apply including benchmark”.
		(1) An ability to understand the processes of planning, designing, building, operating and evaluating information systems relating to the activities of organizations and society, and an ability to solve given problems taking account of the cost - benefit efficiency.
	Criterion 2.1(1)	No additional Items to be Considered in Common Criteria and Appendix 3-1
	Criterion 2.3(1)	The following shall be considered as “to provide a sufficient number of faculty members able to realize the curriculum with applicable educational methods and to improve the educational result of the program, and shall provide the faculty with institutional support.”
		(1) Faculty shall include multiple full-time members, who have a degree higher than Master Degree in information systems. (2) Faculty shall include multiple full-time members, who have experience of leading successful information system development projects for his/her organization (governmental or corporate) or information system development projects for customers.

Appendix 3-3-3 Items to be Considered for Information Technology at Bachelor Level

Name of Field	Specific Items of Related Criterion	Items to be Considered by Field
Information Technology	Criterion 1(2)(d)	The following shall be considered as “knowledge of the related professional fields, and ability to apply including benchmark”.
		(1) An ability to identify user needs accurately and an ability to administer the delivered
	Criterion 2.1(1)	No additional Items to be Considered in Common Criteria and Appendix 3-1
	Criterion 2.3(1)	The following shall be considered as “to provide a sufficient number of faculty members able to realize the curriculum with applicable educational methods and to improve the educational result of the program, and shall provide the faculty with institutional support.”
		(1) Faculty shall include multiple full-time members, who have experience of leading successful information system development projects for his/her organization (governmental or corporate) or information system development projects for customers.

Appendix 3-3-4 Items to be Considered for Computing General at Bachelor Level

Name of Field	Specific Items of Related Criterion	Items to be Considered by Field
Computing General	Criterion 1(2)(d)	The following shall be considered as “knowledge of the related professional fields, and ability to apply including benchmark”.
		(1) Knowledge of and ability of the specific domain of computing targeted by the program.
	Criterion 2.1(1)	No additional Items to be Considered in Common Criteria and Appendix 3-1
	Criterion 2.3(1)	The following shall be considered as “to provide a sufficient number of faculty members able to realize the curriculum with applicable educational methods and to improve the educational result of the program, and shall provide the faculty with institutional support.”
		(1) Faculty shall include sufficient numbers of full-time members, who have experience in providing information processing system made to be used by the third party in premise.

Appendix 4-1 Mandatory Items for Field of Architectural and Architectural Engineering Education Programs at Bachelor and Master Level

Related Items of Criterion	Mandatory Items
Criterion 2.1(1)	Architectural and Architectural Engineering Education Programs at Bachelor and Master Level shall be in accordance with Appendix 1-1 of the Engineering Education Programs at Bachelor Level. As for the Architectural and Architectural Engineering Education Programs at Master Level, the curriculum of the program shall be designed for two-year duration of learning and education and master design, master thesis, or equivalent research assignment shall be included.

Appendix 4-2 Items to be Considered for Field of Architectural and Architectural Engineering Education Programs at Bachelor and Master Level

Related Items of Criterion	Items to be Considered
Criterion 1(2)	The following shall be considered related with each items in Criterion 1 (2) for the Field of Architectural and Architectural Engineering Education Programs at Bachelor and Master Level
	The programs at Bachelor Level shall be in accordance with Appendix 1-2 of the Engineering Education Programs at Bachelor Level. As for the programs at Master Level, following items shall be considered and all of the term “professional activities” mentioned in common criteria and Category-dependent Criteria shall be read “architectural design and architectural engineering” and “professional” as “architectural designer and architectural engineer”.
Criterion 1(2)(a)	The learning outcomes in terms of “(a) An ability of multidimensional thinking with knowledge from global perspective” shall be established by taking account of the following items.
	・ Knowledge of diverse culture and society of mankind as well as nature ・ An ability to take action appropriately based on the mentioned above
Criterion 1(2)(b)	The learning outcomes in terms of “(b) An ability of understanding of effects and impact of professional activities on society and nature, and of professionals’ social responsibility” shall be established by taking account of the following items.
	・ Understanding of impact of technology of field of architectural design and architectural engineering on public welfare ・ Understanding of implication of technology of field of architectural design and architectural engineering on environmental safety and sustainable development of society ・ Understanding of architect and architectural engineers’ ethics

	・An ability to take action based on the understanding mentioned above
Criterion 1(2)(c)	The learning outcomes in terms of “(c) Knowledge of and ability to apply mathematics and natural sciences” shall be established by taking account of the following items.
	・Knowledge of mathematics and natural sciences required in the field of architectural engineering ・An ability to apply including combining the knowledge mentioned above
Criterion 1(2)(d)	The learning outcomes in terms of “(d) knowledge of the related professional fields, and ability to apply” shall be established by taking account of the following items.
	・Knowledge of the related architectural design and architectural engineering fields ・An ability to apply including combining the knowledge mentioned above ・An ability to utilize hardware and software required in the related architectural design and architectural engineering fields
Criterion 1(2)(e)	The learning outcomes in terms of “(e) Design ability to respond to requirements of the society by utilizing various sciences, technologies and information” shall be established by taking account of the following items.
	・An ability to recognize problems to be solved ・An ability to specify constraints from public welfare, environmental safety, and economy to be taking account of ・An ability to logically specify, organize, and analyze problems to be solved ・An ability to plan detailed policies toward problem-solving by taking account of various constraints and applying systematic knowledge of mathematics, natural sciences and engineering sciences in the architectural design and architectural engineering field ・An ability to design architecture by actually solving problems in accordance with the policies as planned
Criterion 1(2)(f)	The learning outcomes in terms of “(f) Communication skills including logical writing, presentation and debating” shall be established by taking account of the following items.
	・An ability to deliver information, opinion and proposal to the others ・An ability to understand information and opinion delivered by others ・An ability to exchange information, opinion, proposal by utilizing foreign languages such as English
Criterion 1(2)(g)	The learning outcomes in terms of “(g) An ability of independent and life-long learning” shall be established by taking account of the following items.

	・Understanding of necessity of continuous professional development to perform as a life-long architect or architectural engineer ・An ability to acquire necessary information and knowledge
Criterion 1(2)(h)	The learning outcomes in terms of “(h) An ability to manage and accomplish tasks systematically under given constraints” shall be established by taking account of the following items.
	・An ability to accomplish tasks systematically under given constraints including time and cost ・An ability to grasp the progress of the plan and modify it as required
Criterion 1(2)(i)	The learning outcomes in terms of “(i) An ability to work as a team” shall be established by taking account of the following items.
	・An ability to precisely judge and carry out own work during collaborative work ・An ability to appropriately judge what others should do and to address to others during collaborative work
Criterion 1(2)(c) Criterion 1(2)(d) Criterion 1(2)(e) Criterion 1(2)(f) Criterion 1(2)(i)	As for the programs at the master level, Distinctive, specific and advanced learning outcomes of the program regarding (c), (d), (e), (f) and (i) in previous section shall be established for the purpose of fostering highly capable architectural designer and architectural engineer who can contribute to public welfare domestically and internationally while acknowledging social responsibilities, from the perspective of following (i) to (v): (i) In-depth knowledge and an ability to apply principles of the program for architectural fields, (ii) Broad knowledge and understanding of related fields or different fields, (iii) An ability to analyze engineering problems, and establish and solve issue, (iv) An ability to establish and verify research, site investigation, and hypothesis, (v) An ability to communicate with people other than architectural fields, and ability to show leadership such as societal and interpersonal skills.

Appendix 4-3-1 Items to be Considered of Architectural and Architectural Engineering Education Programs at Bachelor and Master Level

Name of Field	Specific Items of Related Criterion	Items to be Considered by Field
Architectural Design and Planning	Criterion 1(2)(d)	The following shall be considered as “knowledge of the related professional fields, and ability to apply including benchmark”.
		A program shall be established including following learning outcomes and an ability to perform, understand, knowledge, and experiences of practice expected by “UNESCO/UIA Charter for Architectural Education” shall be disclosed. (1) Ability to create architectural designs that satisfy both aesthetic and technical requirements (2) Adequate knowledge of the history and theories of architecture and the related arts, technologies and human sciences (3) Knowledge of the fine arts as an influence on the quality of architectural design (4) Adequate knowledge of urban design, planning and the skills involved in the planning process (5) Understanding of the relationship between people and buildings, and between buildings and their environment, and of the need to relate buildings and the spaces between them to human needs and scale (6) Understanding of the profession of architecture and the role of the architect in society, in particular in preparing briefs that take account of social factors (7) Understanding of the methods of investigation and preparation of the brief for a design project (8) Understanding of the structural design, construction and engineering problems associated with building design (9) Adequate knowledge of physical problems and technologies and of the function of buildings so as to provide them with internal conditions of comfort and protection against the climate

		(10) Design skills necessary to meet building users' requirements within the constraints imposed by cost factors and building regulations (11) Adequate knowledge of the industries, organizations, regulations and procedures involved in translating design concepts into buildings and integrating plans into overall planning (12) Awareness of responsibilities toward human, social, cultural, urban, architectural, and environmental values, as well as architectural heritage (13) Adequate knowledge of the means of achieving ecologically responsible design and environmental conservation and rehabilitation (14) Development of a creative competence in building techniques, founded on a comprehensive understanding of the disciplines and construction methods related to architecture (15) Adequate knowledge of project financing, project management, cost control and methods of project delivery (16) Training in research techniques as an inherent part of architectural learning, for both students and teachers
	Criterion 2.1(1)	The following shall be considered as "educational components of mathematics, natural sciences and technologies" appropriate to the field.
		Architectural and Architectural Engineering Education Programs at Bachelor Level shall be in accordance with Appendix 1-3-10 of the Engineering Education Programs at Bachelor Level. As for the programs at master level, program shall establish internship and its related courses as equivalent as at least one year experience of professional practice which is accredited based on the regulation no. 1033, paragraph 1 and 2 notified by Ministry of Land, Infrastructure, Transport and Tourism as required experience of professional practice to take examination of "class-1 architects".
	Criterion 2.3(1)	No Items to be Considered for Common Criteria.