

JABEE's Guideline and General Policy on Engineering Design Education

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Accreditation Commission
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The development of engineering design ability is a significantly important component that characterizes engineering education. However, JABEE was identified by the Washington Accord review team that “**Japan may have lack of strength in terms of engineering design education**” and expected to address with the issue at the time of JABEE's application toward becoming a full signatory. JABEE has put effort on improvement of engineering design education (hereinafter referred to as “design education”): held international workshops, made cooperation requests to engineering societies for taking adequate measures, and specifically posted guides to engineering design education on relevant parts of “Manual of Examination and Accreditation” and other examination and accreditation documents. JABEE feels confident that JABEE has made number of improvement as a result of the efforts devoted by JABEE's stakeholders including education institutions. Although JABEE has made some improvements, there is still room for additional effort toward improvement. JABEE has been making requests to its stakeholders for continuous improvement and enhancement by pointing out regarding this issue in recent annual Reports of Examination and Accreditation.

JABEE has come to conclusion that JABEE needs to accelerate movement toward quality assurance of Japanese engineering education through enhancement of design education based on the consideration of examination and accreditation performed so far and current international and domestic trend of engineering education. JABEE has determined its guideline to stress the following aspects of engineering design for the future examination and accreditation, especially after year 2011. JABEE shall implement it into necessary revision of the examination and accreditation documents and make them public in the order of accomplishment. Please consult the revised documents to be published on the JABEE web site for the details of changes of examination and accreditation on engineering design issues: when the change has effect, how the criteria are modified, what kind of issues need special attention, etc. Additionally, each education institution is requested to refer to the following evaluation aspects and highly recommended to address improvement and enhancement of engineering design in advance.

[Evaluation Aspect of Engineering Design]

1. Whether a specific goal is set for engineering design ability.
2. Whether students have learning experience of engineering design or development of a solution to a complex problem.
3. Whether open ended complex engineering problems are assigned which enabling students to develop following abilities:
 - (1) Able to propose multiple ideas,
 - (2) Able to apply various kinds of knowledge learned,
 - (3) Able to communicate with others and collaborate with others in a team,
 - (4) Able to create new concept or a thing by combining principles and knowledge that is commonly acknowledged of,
 - (5) Able to consider restricted conditions such as cost etc,
 - (6) Able to assess impacts on nature and society: public health and safety, culture, economy, environment and ethic.
4. Whether outcomes assessment is implemented including items as follows:
 - (1) If the contents of the problems are deeply studied,
 - (2) If the design outcome or solution is made under consideration of restricted conditions,
 - (3) If the design outcome or solutions is presented well and easy to understand,
 - (4) Other than above, if ever learning objectives related to the engineering design of each program are satisfied (e.g. Ability to conceptualize, ability to express and describe the ideas in drawings, text, equations, programs etc., ability to continuously plan and to work as planned),
5. Whether evidential materials are available for 2. 3., and 4 mentioned above.

Additionally, if the program put the undergraduate research as an only course for the engineering design education, the research study course should satisfy 1-5 mentioned above. Further, common learning outcomes should be set and all students should have substantially equivalent learning experiences to achieve the outcomes. An undergraduate research won't be recognized as design education if students just follow the instructions of supervisors.