

## Accreditation and Assessment Studies of Architectural and Engineering Education in Turkey

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**ABSTRACT:** *Accreditation is a voluntary, generally non-governmental process of peer review. It requires an educational institution or program to meet certain, defined standards or criteria. There are some initiations for educational quality assessment and accreditation in Turkish universities in international and national level. This paper aims to give a systematic summary of accreditation and quality assessment for engineering and architectural education in Turkey. Some analyzing techniques were used to obtain the systematic summary of accreditation and assessment cases. The quantitative and descriptive factors and results were identified for each case. A table will be organized to see all results in a definite way for accredited or assessed departments of engineering and architecture. Aims and missions of the departments were evaluated under the title of philosophy of the department. Number of years, total credits and course types were evaluated under the composition of programs and its structure title. Students' performance criteria or program outcomes of each engineering department and architecture department are compared separately.*

*The initiations on accreditation and quality assessment for architectural and engineering education in Turkey have a history about a decade. Engineering education in this period had some progressive approaches on the issues of international and national accreditation. Two different groups of departments were evaluated and compared in the case study of this paper. Two electrical and electronics engineering program both had ABET's substantially equivalence and EUA's quality assessment gave similar results when we consider aims/missions; total years; total credits hours and ratios of credit hours to technical, non-technical courses and electives. The students' performance/outcomes of these two departments naturally based on ABET's program outcomes and look very similar. The architectural departments also had similarities, however presenting their mission and students' performance/outcomes are very different since one working on an international accreditation.*

### 1 INTRODUCTION

Accreditation and assessment for education mainly related with quality studies. Accreditation is defined as officially declared to be the required standards (YUKSEL et.al: 1995). An institution, which provides architectural or engineering education is considered to be accredited when evaluated against certain quality studies. Accreditation had been generated for the first time in Illinois in 1987 within the context of institutionalization of professional practice. Accreditation is a voluntary, generally non-governmental process of peer review. It requires an educational institution or program to meet certain, defined standards or criteria. Accreditation is sometimes confused with certification. In general, institutions and programs are accredited, and individuals are certified. In the United States, accreditation is used to assure quality in educational institutions and programs. There are two types of accreditation institutional and specialized. Institutional accreditation examines a college or university as a whole educational institution. Specialized accreditation bodies evaluate specific educational programs. Professional accreditation organizations, such as those for medicine, law, architecture and engineering, fall into this category. Accreditation in any field signifies that an institution or program has been

evaluated by an accrediting agency and meets its established educational standards. The accrediting process requires a self-assessment by the institution or program, an evaluation of the self-assessment by the agency, and a site visit and review conducted by a team representing the agency.

Assessment studies are based on self-assessment and end sometimes with quality assurance for education. The self-assessment means evaluation that is done by itself according to some defined criteria. Accreditation and assessment studies can be handled in national and international levels. There are some national accreditation organizations. We can give the examples of NAAB (National Architectural Accrediting Board) for architecture and ABET (Accreditation Board of Engineering and Technology) for engineering in USA. RIBA (Royal British Institute of Architects) is the architectural accrediting organization of United Kingdom. There are some educational quality assessment organizations. These organizations, just like HEFCE (Higher Education Funding for England) and EUA (European University Association) evaluated the higher education programs in all types. Accreditation serves to notify: Parents and prospective students that a program has met minimum standards; Faculty, deans and administrators of a program's strengths and weaknesses and of ways to improve the program; Employers that graduates are prepared to begin professional practice; Taxpayers that their funds are spent well; and The public that graduates are aware of public health and safety considerations (www.naab.org :2004).

There are some initiations for educational quality assessment and accreditation in Turkish universities in national level. The Organization of Deans of Faculties of Engineering working on accreditation studies for last two years based on ABET accreditation system in Turkey. This organization started to visit some engineering departments in 2003 for national accreditation of engineering education. The Higher Education Council has had some assessments about the educational data of all departments in the higher education system. There are some initiations to establish an accreditation system for architectural education. The Communication Group of Chairs of Departments of Architecture (MOBBIG) and Association of Architectural Education (MimED) propose an accreditation system for architectural education in Turkey at October 2002. However it has not been realized yet. On the other hand Turkish Chamber of Architects also proposed a similar accreditation system for architectural education and new approaches for registration of architects. Some departments of engineering in Turkey had international accreditation from ABET called "substantially equivalent". There are also initiations for international accreditation and quality assessment for departments of architecture in different universities.

This paper aims to give a systematic summary of accreditation and quality assessment for engineering and architectural education in Turkey. Some analyzing techniques were used to obtain the systematic summary of accreditation and assessment cases. Every case in the process of accreditation or quality assessment were evaluated by using some parameters, derived and generalized from accreditation and/or assessment models by comparing the similar cases. These parameters are derived and generalized from above mentioned accreditation and quality assessment models' approaches and criteria.

## **2 MODEL OF ANALYSIS**

A model of analysis had been developed for this research to consider different types of accreditation and assessment that had relations to accreditation and assessment issues in Turkey. ABET and NAAB accreditation approaches were evaluated as international accreditation cases; since there are some engineering departments that had "substantially equivalence" of ABET in Turkey and some relations to NAAB have been continued by some departments of architecture. On the other hand a pilot study had been realized in two universities for architectural education by HEFCE. There are also quality assessment studies of EUA in Turkey for different universities that had engineering and architecture departments. Therefore quality assessments of HEFCE and EUA were analyzed in this study to obtain different approaches for assessment approaches. Accreditation approaches of two national organizations had been evaluated and compared to international approaches. Accreditation approaches of MFK (Council of Engineering Faculties Deans) for engineering education and Chamber of Architects' accreditation approaches for architectural education were examined in this case.

## **2.1 Structure, aims and criteria of ABET**

ABET has provided leadership and quality assurance in higher education for over 70 years and currently accredits some 2,500 programs at over 550 colleges and universities in USA. ABET's four accreditation commissions perform the accreditation function and determine accreditation actions in: Engineering, Technology, Computing, and Applied Science subject areas. The Accreditation Board for Engineering and Technology (ABET) is a professional accrediting organization that accredits programs, not institutions. State licensing boards and certification programs may require graduation from an ABET-accredited program as the first step in the registration or certification process for professional practice. General criteria for basic level programs in ABET accreditation:

### **Criterion 1. Students**

The quality and performance of the students and graduates are important considerations in the evaluation of an engineering program.

### **Criterion 2. Program Educational Objectives**

Each engineering program for which an institution seeks accreditation or reaccreditation must have in place: detailed published educational objectives that are consistent with the mission of the institution and these criteria; a process based on the needs of the program's various constituencies in which the objectives are determined and periodically evaluated; a curriculum and processes that ensure the achievement of these objectives; and finally a system of ongoing evaluation that demonstrates achievement of these objectives and uses the results to improve the effectiveness of the program.

### **Criterion 3. Program Outcomes and Assessment**

Engineering programs must demonstrate that their graduates have:

- 1 ability to apply knowledge of mathematics, science, and engineering
- 2 ability to design and conduct experiments, as well as to analyze and interpret data
- 3 ability to design a system, component, or process to meet desired needs
- 4 ability to function on multi-disciplinary teams
- 5 ability to identify, formulate, and solve engineering problems
- 6 understanding of professional and ethical responsibility
- 7 ability to communicate effectively
- 8 the broad education necessary to understand the impact of engineering solutions in a global and societal context
- 9 a recognition of the need for, and an ability to engage in life-long learning
- 10 a knowledge of contemporary issues
- 11 an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

Each program must have an assessment process with documented results.

### **Criterion 4. Professional Component**

The professional component requirements specify subject areas appropriate to engineering but do not prescribe specific courses. The engineering faculty must assure that the program curriculum devotes adequate attention and time to each component, consistent with the objectives of the program and institution.

### **Criterion 5. Faculty**

The faculty must be of sufficient number; and must have the competencies to cover all of the curricular areas of the program. There must be sufficient faculty to accommodate adequate levels of student-faculty interaction, student advising university service activities, professional development, and interactions with industrial and professional practitioners, as well as employers of students.

### **Criterion 6. Facilities**

Classrooms, laboratories, and associated equipment must be adequate to accomplish the program objectives and provide an atmosphere conducive to learning.

### **Criterion 7. Institutional Support and Financial Resources**

Institutional support, financial resources, and constructive leadership must be adequate to assure the quality and continuity of the engineering program.

## **Criterion 8. Program Criteria**

Program Criteria provide the specificity needed for interpretation of the basic level criteria as applicable to a given discipline.

### **Program criteria for electrical, computer, and similarly named engineering programs**

These program criteria apply to engineering programs, which include electrical, electronic, computer, or similar modifiers in their titles.

“The structure of the curriculum must provide both breadth and depth across the range of engineering topics implied by the title of the program. The program must demonstrate that graduates have: knowledge of probability and statistics, including applications appropriate to the program name and objectives; and knowledge of mathematics through differential and integral calculus, basic sciences, computer science, and engineering sciences necessary to analyze and design complex electrical and electronic devices, software, and systems containing hardware and software components, as appropriate to program objectives. Programs containing the modifier “electrical” in the title must also demonstrate that graduates have a knowledge of advanced mathematics, typically including differential equations, linear algebra, complex variables, and discrete mathematics. Programs containing the modifier “computer” in the title must also demonstrate that graduates have a knowledge of discrete mathematics” (www.abet.org :2004).

## **2.2 Structure, Aims and Criteria of NAAB**

NAAB (National Architectural Accrediting Board) is the agency authorized to accredit professional architectural degree programs in United States of America. Since most state registration boards in the United States require any applicant for licensure to have graduated from a NAAB-accredited program, obtaining such a degree is an essential aspect of preparing for the professional practice of architecture (www.naab.org /2004). While graduation from a NAAB-accredited program does not assure registration, the accrediting process is intended to verify that each accredited program substantially meets those standards that, as a whole, comprise an appropriate education for an architect. The first attempt to establish national standards in architecture education came with the founding of the Association of Collegiate Schools of Architecture (ACSA) in 1912. However in 1932, ACSA, American Institute of Architects (AIA), and National Council of Architectural Registration Boards (NCARB) established the NAAB and gave it the authority to accredit schools of architecture nationally. The NAAB's founding agreement of 1940 announced its intention to create an integrated system of architecture education that would allow schools with varying resources and circumstances to develop according to their particular needs. Today, the process of review and revision has become a formalized process of validation.

The curriculum of a NAAB-accredited program includes general studies, professional studies, and electives, which together comprise a liberal education in architecture. The curriculum ensures that graduates will be technically competent, critical thinkers who are capable of defining multiple career paths within a changing societal context.

Standards and procedures for the accreditation of professional programs in the United States were developed in consultation with professional schools, academic institutions, professional societies, state registration boards, members of the profession, representatives of related professions, students and the public.

The NAAB Board is comprised of 14 Directors, three representing the AIA, three representing the ACSA, three representing the NCARB, two representing the AIAS, two public members, and the Executive Director (ex officio).

Historically, the NAAB's primary mission has been to assist programs in fulfilling the broad requirements of the profession of architecture and to encourage the development of practices suited to the particular circumstances of each individual program.

The NAAB recognizes that the areas and levels of excellence will vary among programs as will the approaches to meeting the conditions and reporting requirements. Nevertheless, programs must present complete and accurate information to demonstrate compliance with each of the twelve NAAB Conditions.

Condition 1 Program Response to the NAAB Perspective

Condition 2 Program Self-assessment

Condition 3	Public Information
Condition 4	Social Equity
Condition 5	Human Resources
Condition 6	Human Resources Development
Condition 7	Physical Resources
Condition 8	Information Resources
Condition 9	Financial Resources
Condition 10	Administrative Structure
Condition 11	Professional Degrees and Curriculum
Condition 12	Student Performance Criteria

### 2.3 Structure, Aims and Criteria of HEFCE

The Higher Education Funding Council for England (HEFCE) was established following the Further and Higher Education Act 1992. A principal feature of the legislation was to create one unified higher education sector by abolishing the division between universities and polytechnics (www.hefce.ac.uk :2004). Mission of HEFCE is working in partnership, we promote and fund high-quality, cost-effective teaching and research, meeting the diverse needs of students, the economy and society.

Another significant development under the new legislation was to require the HEFCE to assess the quality of education in the institutions it funds. This was initially carried out by the Quality Assurance Division of the HEFCE. In April 1997, this responsibility passed to a new body, the Quality Assurance Agency for Higher Education.

### 2.4 Structure, Aims and Criteria of EUA

The European University Association, as the representative organization of both the European universities and the national rectors' conferences, is the main voice of the higher education community in Europe. EUA's mission is to promote the development of a coherent system of European higher education and research. For serving its members, both individual and collective, EUA's main focus is :

- 1 Strengthening the role universities play in the emerging European Higher Education Area and Research Area (EHEA and ERA) through contributing to and influencing policy debate and developing projects and other membership services in the interest of its members;
- 2 Working with member institutions through the organization of membership services and the implementation of projects on key issues that aim to improve quality and strengthen individual universities' European profiles;
- 3 Enhancing the European dimension in higher education and promoting the flow of information through the organization of regular meetings and conferences as well as through the preparation and publication of studies analyzing current trends and highlighting examples of good practice;
- 4 Providing advocacy on behalf of its members, both at the European level to promote common policies, and at the international level to promote increased cooperation and enhance the visibility of European higher education in a global context.

EUA has following aims:

- To strengthen an internal quality culture among EUA' s members;
- To support mutual learning among EUA's members;
- To disseminate examples of effective strategic management among European universities;
- To accompany EUA member institutions when they are ready to implement change.

By participating in quality assessment process, participating organization will join a growing number of universities (eighty to date) in more than thirty countries, in and outside of Europe, that have been part of this program and have benefited from it (www.eua.org :2004) . While the evaluation is focused on the institution as a whole, it is possible to select an additional focus, such as:

- research management
- student support services

- internationalization policies
- implementing Bologna
- working with stakeholders
- governance structures
- articulation between the center and faculties
- looking at specific faculties.

## **2.5 Model of Study**

All four accreditation and assessment approaches mainly contain similar criteria. The common criteria may be summarized as follows: Philosophy of the program; composition of the program and its structure; human resources; physical resources; financial resources; quality development systems (self-assessment systems); and students performance criteria (if accreditation is concerned). Some programs were evaluated and compared according to philosophy of the program, composition of the program and its structure, and students performance criteria in this study. These parameters were evaluated for each case in the process of different accreditation and quality assessment organization both for architectural and engineering education programs. The quantitative and descriptive factors and results were identified for each case. A table will be organized to see all results in a definite way for accredited or assessed departments of engineering and architecture.

## **3 HISTORY OF NATIONAL AND INTERNATIONAL ACCREDITATION AND ASSESSMENT IN TURKEY**

Accreditation and assessment studies in Turkey are evaluated historically under the subtitles of international and national accreditation and assessment studies. The historical description of studies covers all departments having the same accreditation or assessment studies. Some of the selected departments had been evaluated and compared in a defined way in the following chapter.

### **3.1 International Accreditation and Assessment Studies in Turkey**

The first accreditation issue in Turkey started in 1994 by Middle East Technical University when Departments of Chemical Engineering and Mining Engineering got “substantially equivalent” titled from ABET. Today 2 departments of Bilkent University (Electrical & Electronics Engineering; Industrial Engineering), 6 departments of Bogazici University (Chemical Engineering; Civil Engineering; Computer Engineering; Electrical & Electronics Engineering; Industrial Engineering; Mechanical Engineering) and 7 departments of Middle East Technical University (Aeronautical Engineering; Computer Engineering; Environmental Engineering; Food Engineering; Geological Engineering; Industrial Engineering; Petroleum & Gas Engineering) have the same title. 12 departments of Istanbul Technical University (Chemical Engineering; Food Engineering; Metallurgical Engineering; Mechanical Engineering; Textile Engineering; Naval Architecture; Ocean Sciences; Aeronautical Engineering; Industrial Engineering; Geological Engineering; Geophysical Engineering; Mining Engineering) had successful visit from ABET in last October. Procedure of getting “substantially equivalence” is continuing now for these departments.

Two departments of architecture (Istanbul Technical University; and Yildiz Technical University) were evaluated in a pilot study organized by Higher Education Council of Turkey and realized by HEFCE in 1997 (URAZ et.al. 2001). Professors from Turkish Universities were appointed as visiting team with a supervisor from HEFCE. Both departments got successful results except lack of self-assessment systems. These two departments got only final reports to assess themselves later from the pilot study. No other further study had been realized in this context.

Four universities in Turkey were assessed by EUA in very near past. These universities are Bogazici University which also had ABET’ substantially equivalence for some departments; Middle East Technical University which also had ABET’ s substantially equivalence for some departments; Marmara University, and Uludag University. Istanbul Technical University is in the evaluation process in these days. The first visit had been realized successfully in March 2004 for Istanbul Technical University.

Department of Architecture at Istanbul Technical University had an application to NAAB for “international assistance” which is offered by NAAB to architectural programs of other countries in 2002. International assistance is not a accreditation but it is an assessment actually. The site visit of NAAB’ s visiting team will be realized in fall 2004 to Istanbul Technical University.

### 3.2 National Accreditation and Assessment Studies in Turkey

The Organization of Deans of Faculties of Engineering in Turkey working on accreditation studies for last two years very similar to ABET’ s accreditation system. This organization started to visit some engineering departments in 2003 for national accreditation of engineering education. There are also some initiations to establish an accreditation system for architectural education. The Communication Group of Chairs of Departments of Architecture (MOBBIG) and Association of Architectural Education (MimED) propose an accreditation system for architectural education in Turkey at October 2002. On the other hand Chamber of Turkish Architects also propose a similar accreditation system for architectural education and new approaches for registration of architects. However both initiations have not been realized yet.

## 4 EVALUATION AND COMPARISON OF EVALUATED SCHOOLS

The evaluation in this part covers the examinations done by some examples of accredited or assessed departments by international level in Turkey. These departments are: Electrical and electronics engineering departments of Middle East Technical University, and Bogazici University which both had ABET’s substantially equivalent and also quality assessment of EUA. Two departments of architecture were chosen to evaluate and compare for this study. The first one is Department of Architecture of Istanbul Technical University, which is under international assistance procedure of NAAB and also EUA’ s quality assessment procedure. The second is Department of Architecture at Middle East Technical University which had the quality assessment of EUA.

The philosophy of the program; composition of the program and its structure, and students performance criteria were evaluated for each department in this study. Engineering departments and architecture departments were evaluated as different groups of cases. Aims and missions of the departments were evaluated under the title of philosophy of the department. Number of years, total credits and course types were evaluated under the composition of programs and its structure title. Students’ performance criteria of each engineering department and architecture department are compared separately.

Table 1. Evaluation of Departments of Electrical & Electronics Engineering

Parameters	METU	Bogazici University
Aims / mission	To instill in students the attitudes, values, vision and training that will prepare them for lifetimes of continued learning and leadership, to develop the ability and passion to work wisely, creatively, effectively for the benefit of society; to generate new knowledge for the betterment of humankind and disseminate it universally; and to generate realistic and innovative solutions for the current and future technological needs and to play a leading role to form the van of social and scientific progress and to provide special services when there are needs that the department is uniquely qualified to meet	The goal of the department is to graduate engineers with a strong level of knowledge in the basic areas of Electrical Engineering who are equipped with the capability and capacity to carry out research, and who maintain high professional ethics along with public awareness and environmental consciousness. Mission: "to provide its students with an excellent undergraduate education to prepare them for graduate school as well as for successful professional careers anywhere in the world."
Total years	4 years	4 years
Total credits	161 credit hours + 8 hours non-credit	150 or 158 credit hours

(hours)	courses : 169 hours	
Course types	Technical: 155/161, non-technical: 6/161 Electives: 36/161 Summer practice: 2 times	Technical: 139/150, non-technical:14/150 Electives : 21/150 Summer practice: 60 days minimum study
Students performance/ outcomes	A strong foundation in basic sciences, mathematics and engineering principles; a sound understanding of the fundamental tools and techniques of electrical engineering; an appreciation of synergy and a culture for sharing responsibilities in multi-disciplinary teams; inculcating professional attitudes and ethics; a culture for life-long learning and adaptation to newly emerging paradigms and approaches; an awareness of effective communication; an ability to creatively apply fundamental theory, tools and techniques to problems in major areas of electrical engineering; in depth knowledge of selected professional level technologies; an awareness of the interaction between the electrical engineering profession and contemporary social and global issues.	Objectives: Strong tools in basic sciences, mathematics and engineering that will support their graduate studies; the broad education, solid technical background and appropriate analytical skills needed for successful professional careers; the combination of skills and orientations needed to perform successfully in increasingly more global working environments; opportunities to learn about and appreciate the importance of ethical, societal, and ecological implications of engineering.

Table 2. Evaluation of Departments of Architecture

Parameters	METU	ITU
Aims / mission		The mission is educating architects and scientists who have creative abilities, sensible to cultural/natural environment, able to produce and use contemporary technologies; supporting national and international architectural issues at the highest level by academic staff, graduates and students with using the special opportunities of being in Istanbul; protecting the eligibility of the architectural profession, to inform and make conscious the public on the subjects of the architecture and environmental issues; to encourage the progress in academic quality for architecture.
Total years	4 years undergraduate 2 years master	4 years undergraduate 2 years master
Total credits (hours)	220 credit hours + 4 non-credit courses	198 credit hours
Course types	Technical: 199/220 non-technical: 21/220 Elective: 24/220 Summer practice: 3 times 60 days	Technical: 121/198 non-technical: 26/198 Elective: 30/198 Summer practice: total 72 working days
Students performance/ outcomes	The objective of the first year is to familiarize the students with basic concepts about the built environment, and with	Ability of <b>Verbal and Writing Skills</b> Ability of <b>Graphic Skills</b> Ability of <b>Research Skills</b>



<p>creative methods and techniques. Development of skills and aptitude in recording observations, experiences and thoughts, in reading and critical evaluation, in incorporating knowledge acquired from studies in other disciplines into design, and in expressing ideas verbally and through methods of visual communication are expected. For the end of the first year, students' summer practice comprises topographical surveying, construction and introduction to use of computers. In the second year, students are introduced to basic principles and conventional technologies for building structure, construction and environmental control. They are expected to develop the skill to use and experiment with these in designing simple environments for small groups of people with a sensitivity for site and context. More advanced knowledge in building science and technologies is expected to enable the third year students in dealing with more complex design situations involving social groups and demanding the use of more complex engineering systems in building and environmental control. Development of the skills is aimed in designing small complexes of buildings in natural and urban settings. At the end of the second year, students work as intern at a construction site. More advanced knowledge in building science and technologies is expected to enable the third year students in dealing with more complex design situations involving social groups and demanding the use of more complex engineering systems in building and environmental control. Development of the skills in designing small complexes of buildings in natural and urban settings is aimed. In the third and fourth years, increasing number of elective courses is expected to help the student to decide on a field of specialization. For the third summer, students work as intern in an architectural office. The fourth year expects from the students the use of the background knowledge and</p>	<p>Ability of <b>Critical Thinking Skills</b>  Ability of <b>Fundamental Design Skills</b>  Ability of <b>Collaborative Skills</b>  Awareness of <b>Human Behavior</b>  Awareness of <b>Human Diversity</b>  Ability of <b>Use of Precedents</b>  Understanding of <b>Western Traditions</b>  Understanding of <b>Eastern Traditions</b>  Understanding of <b>Regional Traditions</b>  Understanding of <b>Environmental Conservation</b>  Ability of <b>Accessibility</b>  Ability of <b>Site Conditions</b>  Understanding of <b>Formal Ordering Systems</b>  Understanding of <b>Structural Systems</b>  Understanding of <b>Environmental Systems</b>  Understanding of <b>Life-Safety Systems</b>  Understanding of <b>Building Envelope Systems</b>  Understanding of <b>Building Service Systems</b>  Ability of <b>Building Systems Integration</b>  Understanding of <b>Legal Responsibilities</b>  Understanding of <b>Building Code Compliance</b>  Understanding of <b>Building Materials and Assemblies</b>  Understanding of <b>Building Economics and Cost Control</b>  Ability of <b>Detailed Design Development</b>  Ability of <b>Technical Documentation</b>  Ability of <b>Comprehensive Design</b>  Ability of <b>Program Preparation</b>  Understanding of <b>The Legal Context of Architecture Practice</b>  Awareness of <b>Practice Organization and Management</b>  Awareness of <b>Contracts and Documentation</b>  Understanding of <b>Professional Internship</b>  Awareness of <b>Architects' Leadership Roles</b>  Understanding of <b>The Context of Architecture</b>  Understanding of <b>Ethics and Professional Judgment</b>  Understanding of <b>Conservation of Historical Sites and Restoration</b></p>
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	experiences from the previous years in complex and specialized design situations, where the proposals are expected to be presented in detail. The projects given are wider in scale (urban and regional) and scope. They are also briefed on issues of professional practice.	
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## 5 CONCLUSION

The initiations on accreditation and quality assessment for architectural and engineering education in Turkey have a history about a decade. Engineering education in this period had some progressive approaches on the issues of international and national accreditation. Some leading universities like Middle East Technical University, Bogazici University, Bilkent University and Istanbul Technical University had or are in the process of substantially equivalence approach of ABET and UEA' s quality assessment system. On the other hand architectural program of Istanbul Technical University started to work on an international quality assessment issue in 1996. The Department of Architecture is on the way of NAAB' international assistance to had an assessment report for its prepared self-assessment study in the fall of 2004.

Two different groups of departments were evaluated and compared in the case study of this paper. The Electrical and Electronics departments of Bogazici University and Middle East Technical University both had ABET' substantially equivalence and EUA' s quality assessment gave similar results when we consider aims/missions; total years; total credits hours and ratios of credit hours to technical, non-technical courses and electives. The students' performance/outcomes of these two departments naturally based on ABET' s program outcomes and look very similar. The architectural departments of Middle East Technical University and Istanbul Technical University also had similarities in seen in Table 2, however presenting their mission and students' performance/outcomes are very different. ITU Department of Architecture re-evaluated the students' performance/outcomes according to NAAB' s approaches and made some additional performance criterion according to its defined mission.

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