

**King Fahd University of Petroleum & Minerals
Dhahran, Saudi Arabia**

Chemical Engineering Department

**Minutes of the Meeting of the Chemical Engineering Industrial Advisory Committee
February 27, 2007, 10:00 a.m., Room 16-221.**

Attendees:

Engr. Ahmad A. Al-Sa'adi
Engr. Amer Al-Sharif (representing Engr. Ahmad O. Al-Khowaiter)
Dr. Hatim D. Al-Dekhiel
Engr. Mansour A. Bukhari
Engr. Abdel Hadi Al-Suhaimi
Dr. Abdullah Shaikh
Dr. Ramazan Kahraman
Dr. Adnan M. Al-Amer (Chairman)

OPENING REMARKS

Al-Amer invited the Dean of Engineering, Dr. Samir Al-Baiyat, to formally open the meeting.

Al-Baiyat welcomed the Industrial Advisory Committee members and thanked them for taking time and attending the meeting. He indicated that the objectives of the Industrial Advisory Committee of engineering departments are to involve local industry in deliberations regarding the quality of the education provided by the institution.

He went on to give the background of evaluation of engineering programs in the university. We were the first college in the Kingdom to be evaluated by an external body. In 1993, we invited ABET (American Board of Engineering Technology) to perform an evaluation of our engineering programs. In the U.S. ABET has a set of criteria for engineering programs, and engineering programs which meet the criteria are formally given the ABET approval for a period of up to 2 to 5 years. The statutes of ABET do not allow them to give a similar seal of approval to universities not in the U.S. or Canada. In lieu of, ABET designates foreign programs that meet the criteria as being "Substantially equivalent in content and breadth to a similar approved program in the U.S." This approval was granted to KFUPM engineering programs in the 1993 evaluation. The programs were reviewed and revised according to the recommendations by ABET and these changes were approved by the university Board in 1997. A second assessment was carried out in Spring 2001 by ABET. They noted with approval that many of the changes requested in the earlier evaluation had been successfully implemented, and they formally granted the programs the "Substantially equivalent in content and breadth to a similar approved program in the U.S." approval.

ABET introduced new regulations recently called "Evaluation Criteria – 2000". These criteria require the formation of an Industrial Advisory Committee in all departments, **exchange of**

information between department and local industry, outcome assessment of our graduates, industrial input on the performance of our graduates, and assessment by recent graduates on the quality of their training at university. The department for its next review in 2008 will be required to gather such assessment data for its report.

Other objectives include:

- **identifying academic requirements of industrial companies**
- **directing applied research in areas that can benefit the industrial sector**
- **enriching faculty experiences by providing opportunities for consultation to industry, and**
- **encouraging industrial companies to participate in short courses, seminars and workshops organized by the department.**

Al-Baiyat thanked the chairman for inviting him to open proceedings and wished the Committee the best of luck in the execution of its tasks.

Al-Saadi said he is happy to participate in the improvement of university programs. He also thanked KFUPM for the activities in professional development of Aramco staff.

Al-Sharif said that he is representing Al-Khowaiter who is involved in formation of King Abdullah University which will include a Graduate Program and a Research Park. There will be a need for cooperation with KFUPM.

Dean indicated willingness to cooperate with Aramco on this matter.

Al-Dekhiel also indicated his happiness to be in this committee. However, he also stated that implementation is more important than just having the committee. Industry and the university can both benefit from the activities of such a committee. Events such as KFUPM and SABIC cooperate on some research projects, it is not at a level we like to see.

Bukhari and Al-Suhaimi also expressed their pleasure to be part of this activity.

Dean stated that Industrial Advisory Committees were not formed for the sake of satisfying the ABET requirement, we like them to be effective in improving our programs.

He also indicated his sadness in having fund for a chairperson position in the department but not being able to recruit a suitable person for that position yet. It is difficult to find qualified people. He welcomed any help on filling the position. He then excused himself from the meeting.

Al-Amer welcomed the industrial members of the committee again and introduced himself. Then all members introduced themselves. The meeting continued with a brief presentation of the department given by Al-Amer. Committee members gave their inputs during the presentation which are summarized below.

PRESENTATION AND DISCUSSION

There was a concern on the vision of the department by the members, it was suggested that it is not good enough having a target to be the best in the Kingdom, our vision should be the best (at least) in the region.

Action Item

Modify the Vision Statement of the department.

There was also concern on the wording of the outcome “Have the ability to engage in life-long learning”. The wording is as suggested by ABET, however it was suggested to make it more specific.

Action Item

Consider modification the wording of the outcome “Have the ability to engage in life-long learning”.

There was also suggestion for inclusion of “Value creation” and “Creating new businesses” in the objectives/outcomes of the program.

Action Item

Review and modify the Objectives and Outcomes of the Chemical Engineering Programs.

Vision and mission statements of the department and the programs and objectives and outcomes of the programs along with the ABET criteria are attached to this minutes as reference for the members.

There was a short discussion on GPA of our graduates and it was suggested to have a GPA distribution of our graduates.

Action Item

Prepare GPA distribution of ChE Graduates.

It was indicated that SABIC does not hire engineers with GPA less than 2.5 and Aramco does not hire engineers with GPA less than 2.5 for manufacturing and does not even consider engineers with less than 3.0 for professional positions.

Bukhari indicated that it is difficult to keep graduates with high GPA (above 3.0) in their positions. Al-Saadi indicated that they did not observe this trend in Aramco.

Bukhari recommended inclusion of leadership skills in the program.

(College of Engineering is working on modifying the general education courses. Recently addition of a course on Business Entrepreneurship is being discussed.) (Note by Kahraman)

Al-Dekhiel stated that the Graduate Programs should not be so rigid and more difficult than even the ones in USA, as sometimes claimed. Committee members from the department indicated that the rigidness comes from the government rules.

Bukhari complained about the English skills of our graduates in recent years.

According to Dr. Shaikh one reason might be that Arabic is used in large extent in some courses by Arabic speaking faculty. We used to have more Western faculty before, now Arab faculty are in majority. Al-Amer added that the English program needs improvements. We are having difficulty keeping the quality faculty because of competition in the region.

Al-Saadi said that this is not critical in our case. We have the right culture to improve their English. Bukhari then commented that we are spending a lot on them.

Seeing the lack of an undergraduate elective in the area of Process Automation due to lack of expertise in that area in the department, Bukhari suggested that companies such as Honeywell, Yakogawa, Siemens can be approached to teach electives in that area.

Al-Dekhiel indicated that they could also be part of teaching electives if they are concentrated to a shorter time than a full semester. Al-Amer commented on this as saying it would be difficult to do that for the undergraduate program.

Action Item

Consider companies such as Honeywell, Yakogawa, Siemens to teach electives in Process Automation.

Al-Saadi listed the areas of collaboration as 1) Industry funded projects, 2) Review of curriculum, 3) Instructors from industry.

Shaikh commented that some years ago one person from Aramco (Dr. Abussaud) taught heat transfer.

Al-Saadi and Al-Dekhiel suggested that we focus on some research areas. We need to come together with specific faculty and discuss what can be done. We need to see what kind of projects the faculty are involved with.

Action Item

Consider (a) short presentations by faculty who are active in research or (b) preparation of a write-up including short summaries of research experience of chemical engineering faculty.

ADJOURNMENT

Al-Amer thanked everyone for coming to the meeting, and for their valuable time, input, and suggestions. We are looking forward to the outcomes of such meetings as it will enhance the department and faculty. He said the minutes of the meeting will be distributed to all members and to the university administration. The next meeting of the Committee will be held after the month of Ramadan in the next academic year. The meeting adjourned at 12:00 p.m.

Luncheon: At 12:15 p.m.

Dr. Ramazan Kahraman
Secretary of the Committee

Dr. Adnan M. Al-Amer
Chairman of the Committee

ATTACHMENTS

ABET CRITERIA

Engineering programs must demonstrate that their students attain:

- (a) an ability to apply knowledge of mathematics, science, and engineering
- (b) an ability to design and conduct experiments, as well as to analyze and interpret data
- (c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
- (d) an ability to function on multi-disciplinary teams
- (e) an ability to identify, formulate, and solve engineering problems
- (f) an understanding of professional and ethical responsibility
- (g) an ability to communicate effectively
- (h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
- (i) a recognition of the need for, and an ability to engage in life-long learning
- (j) a knowledge of contemporary issues
- (k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

In addition, an engineering program must demonstrate that its students attain any additional outcomes articulated by the program to foster achievement of its education objectives.

Vision Statement of the Chemical Engineering Department

The Department of Chemical Engineering will be the undergraduate chemical engineering department of choice in Saudi Arabia and will be recognized as one of the top research and graduate chemical engineering departments in the Kingdom.

Mission Statement of the Chemical Engineering Department

The mission of the Department of Chemical Engineering at King Fahd University of Petroleum & Minerals is to provide an innovative educational program that is rigorous and challenging as well as flexible and supportive. The program is designed to meet the challenges that our graduates are likely to face throughout their professional careers and to provide a high level of scholarship and professional capability, with highly-developed skills in lifetime learning, planning, problem-solving, communication and leadership.

Vision Statement of the Undergraduate Chemical Engineering Programs

The undergraduate program of the Department of Chemical Engineering will be recognized for excellence by its students, faculty, alumni, their employers, and other departments, both nationally and internationally.

Mission Statement of the Undergraduate Chemical Engineering Programs

The mission of the undergraduate programs in the Department of Chemical Engineering is to equip students with high quality education, fundamentals of chemical engineering, interdisciplinary knowledge, awareness of local industry needs, and skills in lifetime learning, communication and leadership. The mission of the applied program is more industrially oriented as 28 weeks of industrial experience are required in contrast to the science program where only eight weeks are required.

Chemical Engineering Undergraduate Program Objectives

Graduates of KFUPM Chemical Engineering Programs will be able to

1. Apply mathematical, scientific, and engineering principles in their professional chemical engineering practice.
2. Engage in adopting and developing new technology.
3. Demonstrate technical leadership in a broad range of process industries.
4. Demonstrate ethical and professional standards in their industrial practice.
5. Communicate effectively in both English and Arabic in industrial practice.

Chemical Engineering Undergraduate Program Outcomes

At the time of graduation, students of the KFUPM Chemical Engineering Programs are expected to:

1. Apply knowledge of mathematics, science, and engineering principles in solving chemical engineering problems [1]^{*} (a, e)[&].
2. Have the ability to engage in life-long learning [2] (i).
3. Design and evaluate chemical processes [1] (c).
4. Conduct chemical engineering experiments and analyze and interpret plant data [1] (b).
5. Function and work with others in multidisciplinary teams [3] (d).
6. Communicate effectively both in English and Arabic [5] (g).
7. Apply modern simulation software [2] (k).
8. Be aware of professional and ethical responsibilities in the workplace [4] (f).
9. Recognize environmental and societal impact of engineering decisions [4] (h).
10. Apply safety rules in the work place [4] (h).
11. Recognize contemporary issues related to the chemical engineering profession [4] (j).
12. Practice chemical engineering in industry through two and seven months industrial training for science and applied programs, respectively [1] (a, k).

* The numbers in [] reference the corresponding objectives.

& The letters in () reference ABET2000 outcomes a-k.

Vision Statement of the Graduate Chemical Engineering Programs

The graduate program of the Department of Chemical Engineering will be recognized for excellence by its students, faculty, alumni, their employers, and other departments, both nationally and internationally.

Mission Statement of the Graduate Chemical Engineering Programs

The mission of the graduate programs in the Department of Chemical Engineering is to equip students with quality advanced education, interdisciplinary knowledge, basic and applied research techniques, awareness of recent developments in chemical engineering and current industrial problems, and skills in lifetime learning, communication and leadership.

Chemical Engineering Graduate Program Objectives

The graduates of the program are expected to:

1. Apply advanced mathematical, scientific and engineering principles in design, operation, research and development of chemical processes.
2. Engage in adopting and developing new technology.
3. Demonstrate skills in critical analysis of engineering problems.
4. Demonstrate communication and technical leadership skills.
5. Demonstrate ethical and professional standards in their industrial and/or academic practice.

Chemical Engineering Graduate Program Outcomes

The students on completion of the program are expected to:

1. Apply knowledge of advanced mathematics, science, and engineering principles in solving chemical engineering problems [1]*.
2. Have the ability to engage in life-long learning [1,2].
3. Apply state-of-the-art software and simulation packages [1].
4. Conduct independent research [2,3].
5. Conduct research experiments and interpret and model the data [1,2,3].
6. Function and work with others in multidisciplinary teams [4].
7. Communicate effectively orally and in writing [4].
8. Apply safety rules in the work place [5].
9. Be aware of professional and ethical responsibilities in the workplace [5].
10. Recognize environmental and societal impact of engineering decisions [5].
11. Recognize contemporary issues related to the profession [5].

* The numbers in [] reference the corresponding objectives.