The Committee for the Evaluation of Chemical Engineering Study-Programs

Ben-Gurion University of the Negev

Evaluation Report

Contents

Chapter 1 - Background

At its meeting on October 23, 2007 the Council for Higher Education (CHE) decided to evaluate study programs in the fields of Chemical Engineering during the academic year 2008-2009.

Following the decision of the CHE, the Minister of Education, who serves ex officio as a Chairperson of the CHE, appointed a Committee consisting of:

- ***Prof. Thomas F. Edgar*** - Department of Chemical Engineering, University of Texas, Austin, USA – Chair
- ***Prof. Emeritus. Zehev Tadmor*** **,**Department of Chemical Engineering, the Technion – Israel Institute of Technology, Israel, and Chairman of the S. Neaman Institute of Advanced Studied in Science and Technology, Technion – co-Chair
- ***Prof. Morton M. Denn*** - Department of Chemical Engineering, the City College of New York, USA.
- ***Prof. Josef C. Merchuk*** - Department of Chemical Engineering, Ben Gurion University, Israel.
- ***Prof. Stanley l. Sandler*** - Department of Chemical Engineering, University of Delaware, USA.

Ms. Noa Nof Steiner - Coordinator of the Committee on behalf of the Council for Higher Education.

Within the framework of its activity, the Committee was requested to:[1]

1. Examine the self-evaluation reports, submitted by institutions that provide study programs in Chemical Engineering, and to conduct on-site visits at those institutions.
2. Submit to the CHE an individual report on each of the evaluated academic units and study programs, including the Committee's findings and recommendations.
3. Submit to the CHE a general report regarding the examined field of study within the Israeli system of higher education including recommendations for standards in the evaluated field of study..

The entire process was conducted in accordance with the CHE's Guidelines for Self-Evaluation (of October 2007).

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[1] The Committee's letter of appointment is attached as **Appendix 1**.

Chapter 2 - Committee Procedures

The Committee members received the self-evaluation reports in March, 2009, and discussed them via email.

The Committee held its first meeting on May 3, 2009**,** during which it discussed fundamental issues concerning higher education in Israel, the quality assessment activity, as well as Chemical Engineering study programs.

In May 2009, the Committee members visited the institutions holding Chemical Engineering study programs. During the visits, the Committee met various stakeholders at the institutions, including management, faculty, staff, and students.

This report deals with the **Department of Chemical Engineering at Ben-Gurion University of the Negev.**

The Committee's visit to Ben-Gurion University took place on May 11-12, 2009. The schedule of the visit, including the list of participants from the institution, is attached as **Appendix 2**.

In order to avoid the appearance of conflict of interests, Prof. Josef C. Merchuk, who has been faculty member of the Department, did not participate in the evaluation of this department.

The Committee members thank the management of the Ben-Gurion University and the Department of Chemical Engineering for their self-evaluation report and for their hospitality towards the Committee during its visit at the institution.

Chapter 3: Evaluation of the Department of Chemical Engineering, at Ben-Gurion University of the Negev

** This Report relates to the situation current at the time of the visit to the institution, and does not take account of any changes that may have occurred subsequently. The Report records the conclusions reached by the Evaluation Committee based on the documentation provided by the institution, information gained through interviews, discussion and observation as well as other information available to the Committee. The study program that was current at the time of the visit to the institution is attached as* ***Appendix 3.***

Background

The Department of Chemical Engineering at the Ben-Gurion University was established in 1966 under the auspices of the Chemical Engineering Department of the Technion, and became independent in 1970. During the 2007-08 academic year, Ben-Gurion University student population was over 17,000, of whom roughly 11,000 were at the undergraduate level and nearly 6,000 at the graduate level. In 2007-08, there were 233 undergraduate students, 16 master's level students, and 15 doctoral students, enrolled in the Department of Chemical Engineering. The same academic year the Department granted 63 B.Sc. degrees, 6 master's level degrees and 3 Ph.D. degrees.

Faculty

The faculty of the Chemical Engineering Department currently consists of 11 senior staff, including one untenured lecturer and two untenured senior lecturers; one professor is a senior member of the University administration and one heads a major interdisciplinary center. The Department formerly had fourteen senior staff, and the current core faculty is of a minimal size to offer a full undergraduate and graduate chemical engineering curricula. Fewer than half of the current faculty members have academic backgrounds or experience suitable for teaching core process-oriented courses in chemical engineering. It is the Committee's understanding that one potential additional faculty member with a chemical engineering background is currently doing postdoctoral work in the United States and is expected to return to join the faculty. This still leaves the Department with the barest minimum number of faculty members available to cover the core B.Sc. curriculum, and further faculty additions in the near future are essential. The problem is compounded by the fact that the Department Chair is planning to retire

in one year, and that all of the faculty members currently teaching core courses are eligible to begin earned terminal sabbatical leaves between 2013 and 2015 and may not be available for teaching thereafter. In the absence of an infusion of new faculty members with the appropriate education or training to teach the core courses on an expedited time scale, the Department could become unable to offer a quality program in chemical engineering. While this is a “worst-case" scenario, it is plausible and must be taken into account in institutional planning. There is also a potential leadership gap with few mid-career faculty in the Department who could become Chair. This situation is discussed later in the report.

The senior faculty members believe that faculty recruiting is difficult because of the small number of Ph.D. chemical engineers interested in academic careers and the distance of Beer-Sheva from the center of the country. It does not appear that the Department has been proactive in seeking out qualified potential faculty members, especially among Israeli Ph.D. chemical engineers who are outside the country and who might consider returning to an attractive and challenging position. Competitive startup packages must be part of any recruiting campaign, and care must be taken to avoid misunderstandings about startup commitments.

Senior faculty members are active in research, and some have strong international programs. One senior faculty member is a Foreign Associate of the U.S. National Academy of Engineering.

Undergraduate Study Program

The freshman admission quota for the department is 80 students, but the actual number admitted has been fewer in recent years to maintain quality. On the other hand, there appears to be great demand for the Chemical Engineering major, with 4 out of 5 applicants rejected. Decision on whom to admit is made in the Dean’s office. Consideration should be given to including additional faculty members in the process. The faculty expressed concern over the quality of some of the first year students because of poor high school training, but the first year of studies serves as a filter, and 15 to 20 students drop out because they fail to meet the departmental standards. The faculty felt that the students remaining after the first year were very good, leaving a solid group of high quality and dedicated students,

who are loyal to the department and seem to enjoy their studies (although they work very hard). Many of the students desire to continue their education, at least towards a master's degree.

The instructional program has three tracks: a) Processes and Advanced Materials; b) Biochemical Engineering; and c) Nanotechnology (joint with chemistry). Students must choose one of the tracks. Only the Process and Advanced Materials track has electives, and it allows 25 points of elective courses restricted to science and engineering. Nine of these points can be used for a two-semester senior research project, which usually requires an effort of one day per week. The committee understands that most students choose to take nine points of courses. The Biotechnology and Nanotechnology tracks have removed all elective courses, replacing them with required courses.

The Nanotechnology program requires 200 credit points in 4 years, and degrees are awarded in both chemical engineering and chemistry. The Committee believes that broad nanotechnology content in this excellent academic track is necessarily limited, while the program's unique strength is its strong component of materials chemistry. The content of the program appears to be broader and less restrictive than the name "Nanotechnology" implies. The number of graduates of this very demanding program has ranged from 7 to 20 per year, and the Department faculty feel that these students are superb. Among the unique features of the program is that the students are involved in a "Journal Club", reading research papers and learning research techniques throughout all 8 semesters. It is the *de facto* honors program in the department.

The undergraduate research projects presented were of high quality and enable the students to have a positive research experience. The students are satisfied by the quality of the lectures, but would like options for choosing electives, even including humanities and social sciences courses. The Committee supports the idea of the University opening its humanities and social sciences courses to chemical engineering students.

The Committee understood that there appear to be some bureaucratic and course scheduling hurdles for the students when taking courses outside of the department; they must get permission from both chemical engineering and the outside department to enroll in such courses. In addition, the students commented that there are no courses in environmental pollution or safety, and that the economics course they take is theoretical and does not relate to chemical engineering design.

Some students work part-time in local industry in their third and fourth years. Most students complete the program in 4 years, and the average time to completion of degree is only slightly longer than this.

Approximately only 1/3 of the homework assignments are graded, which the committees feels is low, and this grading is done by the TAs. All examinations are graded by the faculty. Students feel the quality of the core courses is very good, while they are less positive about first year mathematics and physics courses. There are online courses that the students like, sometimes better than the frontal lecture, although some of the online courses in mathematics and physics are quite dated. There is only one online course in chemical engineering, and it is by a retired faculty member. The HighLearn system is used extensively for posting course materials, syllabi, PowerPoint slides, etc. by all faculty and is appreciated by the students. Also, the faculty and the Department Chair have an “open door” policy that provides good communication between faculty and students, and assistance to the students as needed.

The design course is taken over the final two semesters, and is taught by an adjunct faculty member with many years of design experience who creatively uses other practicing engineers as consultants. Design projects are done in groups of three students, with each group having a different design project. Modern computer simulation software is used in the design course.

The undergraduate instructional laboratories/experiments have been improved in recent years, largely with the purchase of ready-made equipment. The department has also been developing some of its own experiments. The students felt that some of the experiments were outdated, with limited computerized data logging.

Only a few students take the B.Sc.-M.Sc. fast track program. The departmental faculty felt there was mixed success with the program, with some students doing well and others not.

The Undergraduate Committee reviews courses on an unspecified schedule, so that the courses are up to date. This is important since there are a small number of faculty members who can teach core chemical engineering courses, and little course rotation in teaching. The Faculty of Engineering Sciences increased the teaching load from nine to twelve credit points several years ago. This is a heavy teaching load for a university faculty, and has been mitigated to some extent by providing faculty members teaching credit for research and student projects.

There is very little on safety in the instructional program, with less than 3 hours of instruction in the design course, and no coverage of environmental considerations and regulations. Overall, there is not a proper culture of safety in the instructional and research laboratories.

While we were not provided with detailed information on what happens to their students after graduation, the faculty perception is that about 20% go for advanced degrees, largely at BGU, and many others become process engineers in industry. Many of the Nanotechnology Program graduates obtain jobs with high technology companies, although approximately 50% go to work in the chemical industry, and the remaining go to graduate school, marketing, family business, aboard, etc. In general, the Nanotechnology Program graduates are more likely to go to graduate school. Even though the Department holds career days, there appears to be limited student career guidance and assistance in job placement.

Graduate Study Program

As with other graduate programs in Israel, students are required to TA, which includes grading homework and leading tutorials, and takes about 2 days/week. TAs are financially rewarded for this service. Almost all graduate students were BGU undergraduates, and about half of those wish to continue to Ph.D. studies. There are three mandatory courses and five elective courses for the M.Sc. degree, and three to four additional courses for the Ph.D. The Ph.D. takes 5.5 to 6 years to

complete beyond the Bachelor's degree; there is an option of direct route to Ph.D (skipping the M.Sc.) but very few students take it.

In its self-study, the Department says: *"The University lacks the ability to cope with foreign students and lacks of flexibility regarding students from other backgrounds"* at the graduate level. The Committee was informed that "*other backgrounds*" means from *disciplines* other than chemical engineering. This reduces the pool of potential graduate students. The general perception among the students is that there are limited career opportunities for Ph.D. graduates in chemical engineering in Israel, which further limits the number of students who consider the Ph.D.

Biotechnology Studies

The Ben Gurion University has a program in Biotechnology Engineering. It was not in the Committee's charge to examine this program, but it did meet with two senior faculty members from this program in order to understand the relationship of the Biotechnology Engineering program to the program in Chemical Engineering. The Committee has been told by the representatives of the BGU administration that serious consideration is being given to the formation of a school that would include chemical engineering and biotechnology engineering, as well as perhaps other related academic units such as environmental engineering and biomedical engineering. There are obvious intellectual connections between chemical engineering and biotechnology engineering, and the academic programs contain some similar course content. Potential synergies that might arise from the formation of such a school, in which students could take a common first year as well as some subsequent courses, should be given serious consideration, especially in view of the small number of core faculty members in chemical engineering and the common material in some core courses in the two Departments. This may be a way to avoid the "worst case" scenario of dealing with a large number of retirements mentioned earlier.

The idea of forming a "school" is being promoted by the management and supported by the faculty (including the Biotechnology faculty). This may be a positive step, provided that students could initially enroll in the "school" (and not

in a specific department) and then, after a year or two, be free to select the particular department from which they wish to graduate. In addition, by reorganizing the departments into a school, undergraduate teaching will be more cost-effective and graduate students will have a broader choice of courses than the rather limited choices they have now.

Research

An active research program requires a cadre of research students, preferably Ph.D. students. The size of the graduate program, whether measured in absolute terms or per senior faculty member, is small by international standards; also, most graduate students received their B.Sc. degrees from Ben Gurion University and then enrolled as graduate students, in some cases continuing research started as a B.Sc. research project. Some faculty members believe that good external students are reluctant to come to the University because of its location, while others believe that the number of graduate research students is limited by the availability of research funds; roughly 50% of fellowship funds come from University sources and 50% from research grants. External funds are also required to pay a major fraction of the direct costs of research. The Department spends about US$1,200,000/year in research funds from competitive and government grants, or somewhat over US$100,000/year/faculty member, which is a modest amount for a research-oriented department in the U.S. Several faculty members are exceptionally successful in getting significant industrial funding, especially from abroad. There is a small group of enthusiastic young faculty, who are having some difficulty with research fund-raising. The bulk of the external research funds in grants reported by the Department in the self-study report were being generated by six faculty members, but only about half of the M.Sc. and Ph.D. students of record at that time were carrying out research with these faculty members. There is strong activity and leadership in the areas of reaction engineering and rheology. However, due to the relatively small staff size, it will be difficult for the Department to develop a critical mass in both biotechnology and nanotechnology without growth in the number of the faculty.

Faculty members are doing research in areas that are typical of modern chemical engineering departments (although the research is generally more applied), and

they are publishing their work in good international journals. A greater effort on the part of the less research-active faculty members to obtain competitive external research grants would enhance the potential for an increase in the size of the graduate student population. In addition, a vigorous program to attract qualified graduate students from Israel and abroad is essential. Reaching out to students with undergraduate majors in closely related areas such as biotechnology, biomedical engineering, and materials engineering, could expand the pool of potential students. Serious thought might be given to more active recruiting from chemical engineering and biotechnology programs in Israel's colleges, whose very best students are likely to be qualified for graduate studies with little or no additional preparation.

Infrastructure

The Committee evaluated the infrastructure for the Department of Chemical Engineering with respect to laboratories (both undergraduate and research), computing laboratories, and the library. As mentioned in the section on curriculum and teaching, the undergraduate laboratories are satisfactory but could be modernized further by adding data acquisition capability to several experiments. Improvements in safety practices in both research and teaching laboratories should be made a high priority. As the graduate program grows in the future along with faculty size, there will be a need to add space for the research program. Presently the research laboratories are well equipped but are quite cramped; the opening of the new Nanotechnology Building will allow some faculty to move their research there, thus freeing up space. The computer facilities appear to be up-to-date, and the department has implemented a life-cycle replacement program for its computer rooms. The Committee was informed by the students and the faculty that they have good access to a wide range of electronic resources at the library.

Long-range Planning

There is a clear well-thought out long-range plan in the field of nanotechnology, with the creation of a very successful educational track and with major investments in physical facilities. However, a similar long-range planning activity for the Department is not evident. For example, the Department has created new educational tracks without increasing the number of faculty to the needed level.

Moreover, due to administrative policy, senior faculty have accumulated multiple years of sabbatical leaves, and these productive faculty could be on leave simultaneously from the department within four to five years (and will not be able to be replaced before the completion of these sabbatical leaves), before the mid-career faculty can assume the leadership of the Department. An additional negative consequence of this scenario is that serious teaching and research gaps in core chemical engineering capability will ensue. Not only will this threaten the character of the Department as a chemical engineering department, but in the event that a "school" is established, there is a serious risk that the Chemical Engineering Department's identity will fade away within the new larger entity. Consequently, there is an urgent need to recruit four to five faculty members with chemical engineering backgrounds or in disciplines closely related to chemical engineering during the next five years, and the University should allow these faculty replacements to be hired before the sabbatical leave obligations are fulfilled. Several of these hires should be mid-career faculty to fill in the "age-gap" within the current faculty and to help provide leadership within the Department.

The need for systematic improvement in the research capability in the Department should be addressed through the development of a strategic plan; such planning is now considered to be a best practice for leading departments of chemical engineering in the U.S. As the Department seeks to improve the quality and size of its graduate program in an environment of limited resources, it is important to be able to prioritize future faculty hiring and moving into new research directions, and understand the associated space and equipment requirements. Moreover, the faculty should reach a shared vision of where the Department wants to be in five years. Having such consensus in a written document will help achieve alignment between the Dean and the faculty, which might make future resources easier to obtain. Such a document could rectify the apparent uncertainty in the Department regarding how many open faculty positions are available for recruitment. Formulating a viable long-range strategic plan, the development of a sustainable vision for the Department and the recruitment of excellent young and mid career faculty, requires very strong academic leadership. The committee strongly recommends that such a leader be identified and appointed.

Collaboration with Sami Shamoon College of Engineering

The proximity of BGU to the Sami Shamoon College of Engineering (SCE) suggests that collaboration between the two institutions should be possible in a number of areas. This would enable the SCE students to take technical electives at BGU, take courses in humanities and social sciences not offered at SCE in order to expand the horizons of future engineers, and to freely use library facilities. Such cooperation does not presently occur. Therefore, the Committee wishes to encourage the leadership of Sami Shamoon and BGU to explore the feasibility of such cooperation, as well as reexamining the possibilities for SCE graduates to pursue M.Sc. degrees at BGU, and for SCE faculty to spend summers or semester-long sabbaticals at BGU. We would expect that the Planning and Budgeting Committee would look favorably to such collaboration and perhaps support it financially. An advantage to BGU would be the recruitment of additional graduate students, some of whom could be funded to be TAs at SCE while doing their research with BGU faculty.

Self Evaluation Report

The BGU faculty indicated they were all involved to varying degrees in the self-evaluation report and found it to be a useful exercise.

Summary Recommendations

The Department is meeting the needs of industry in the South of Israel in its undergraduate and graduate programs.

A major initiative to recruit faculty members who will be capable of teaching core chemical engineering courses should be executed on an expedited time scale. These should be both mid-career (to address the age gap) and young faculty. It is important to develop the future leadership of the Department in the next few years, either internally or by an external mid-career appointment, (including the possibility that the new Chair would be an external hire). However, the age gap problem will not necessarily be solved by recruiting a new head for the possible School.

Synergies and efficiencies may occur from the establishment of a School that incorporates both Chemical Engineering and Biotechnology, which will require a strong leader.

The content of the Nanotechnology Program appears to be broader and less restrictive than the name "Nanotechnology" implies, and the program's unique strength is its strong component of materials chemistry.

Only 1/3 of the homework assignments in the required courses are graded, which the committees feel is lower than desired.

The Ph.D. program should be expanded over the next five years. A vigorous program to attract qualified graduate students from Israel and abroad is essential. Reaching out to students with undergraduate majors in closely related areas such as biotechnology, biomedical engineering, and materials engineering could expand the pool of potential students. Serious thought might be given to more active recruiting from chemical engineering and biotechnology programs in Israel's colleges, whose very best students are likely to be qualified for graduate studies with little or no additional preparation.

There should be Department-wide development of a long-range plan in the near future. This is especially important given the possibility of the creation of a School and the imminent retirement of the Department Chair.

The Committee supports the idea of the University opening its humanities and social sciences courses to chemical engineering students.

Consideration should be given to including additional faculty members (e.g., an admissions committee) in the process of accepting and placing new students.

Improvements in safety practices in both research and teaching laboratories should be made a high priority.

Signed by

Prof. Thomas F. Edgar, Chair

Prof. Zehev Tadmor, Co-Chair

Prof. Morton M. Denn

Prof. Stanley I. Sandler

Appendices

مجلس التعليم العالي
המועצה להשכלה גבוהה
COUNCIL FOR HIGHER EDUCATION
Planning & Budgeting Committee | הועדה לתכנון ולתקצוב

February 4, 2009

Prof. Thomas F. Edgar
Department of Chemical Engineering
University of Texas, Austin
USA

Dear Professor Edgar,

The State of Israel undertook an ambitious project when the Israeli Council for Higher Education (CHE) established a quality assessment and assurance system for Israeli higher education. Its stated goals are: to enhance and ensure the quality of academic studies; to provide the public with information regarding the quality of study programs in institutions of higher education throughout Israel; and to ensure the continued integration of the Israeli system of higher education in the international academic arena. Involvement of world-renowned academicians in this process is essential.

This most important initiative reaches out to scholars and experts in the international arena in a national effort to meet the critical challenges that confront the Israeli higher education system today. The formation of international evaluation committees represents an opportunity to express our common sense of concern and to assess the current and future status of education in the 21st century and beyond. It also establishes a structure for an ongoing consultative process among scientists and professionals around the globe on common academic dilemmas and prospects.

I therefore deeply appreciate your willingness to join us in this crucial endeavor.
It is with great pleasure that I hereby appoint you to serve as Chair of the Council for Higher Education's Committee for the evaluation of Chemical Engineering Studies.
The composition of the Committee will be as follows: Prof. Thomas F. Edgar – Chair, Prof. Zehev Tadmor– co-Chair, Prof. Jose' C. Merchuk, Prof. Denn Morton and Prof. Stanly l. Sandler.
Ms. Noa Nof-Steiner will coordinate the Committee's activities.

In your capacity as the Chair of the Evaluation Committee, you will be requested to function in accordance with the enclosed appendix. I wish you much success in your role as a member of this most important committee.

Sincerely,

Professor Yuli Tamir
Minister of Education, Culture and Sport
and Chairperson of the Council for Higher Education

Enclosures: Appendix to the Appointment Letter of Evaluation Committees
cc: Ms. Riki Mendelzvaig, Secretary of the Council for Higher Education
Ms. Michal Neumann, Head of the Quality Assessment Unit
Ms. Noa Nof-Steiner, Committee Coordinator

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October 2009

Appendix to the Letter of Appointment for Evaluation Committees (Study Programs)

1. General

On June 3, 2003 the Council for Higher Education (CHE) decided to establish a system for quality assessment and assurance in Israeli higher education, which came into effect in the academic year of 2004-2005. Within this framework, study-programs are to be evaluated approximately every six

The main objectives of the quality assessment activity are:

- To enhance the quality of higher education in Israel;
- To create an awareness within institutions of higher education in Israel to the importance of quality evaluation and to develop an internal culture of self-evaluation, as well as the required mechanisms;
- To provide the public with information regarding the quality of study programs in institutions of higher education throughout Israel;
- To ensure the continued integration of the Israeli system of higher education in the international academic arena.

It is not the CHE's intention to rank the institutions of higher education according to the results of the quality assessment processes. The evaluation Committee (hereinafter "Committee") should refrain from formal comparisons.

2. The Work of the Evaluation Committee

2.1 The Committee shall hold meetings, as needed, before visiting the institution, in order to evaluate the material received.

2.2 The Committee shall visit the institutions and the academic units being evaluated – if possible - within 4-6 months of receiving the self-evaluation reports. The purpose of the visit is to verify and update the information submitted in the self-evaluation report, clarify matters where necessary, inspect the educational environment and facilities first hand, etc. During the visit, the Committee will meet with the heads of the institution, faculty members, students, alumni, administrative staff, and any other persons it considers necessary.

2.3 The duration of the visits (at least one full day) will be coordinated with the chairperson of the Committee.

2.4 Following the visit, the Committee will submit the CHE with:
1. A final report on each of the evaluated departments,
2. A general reports on the state of the discipline in the Israeli higher education system. The general report will include recommendations to the CHE for standards and potential state-wide changes in the evaluated field of study.

2.5 The reports will be sent to the institutions and the academic units for their response.

2.6 The reports and Committee's findings will be submitted to the CHE and discussed within its various forums.

3. Conflict of Interest Policy

3.1 In order to avoid situations that may question the credibility and integrity of the evaluation process, and in order to maintain its ethical, professional and impartial manner, before issuing their Letter of Appointment members and chairperson of the evaluation Committee will sign a Declaration on Conflict of Interest and Confidentiality.

3.2 In the event that a member of the Committee is also a current or former faculty member at an institution being evaluated, he/she will not take part in any visits or discussions regarding that institution.

4. The Individual Reports

4.1 The final reports of the evaluation Committee shall address every institution separately.

4.2 The final reports shall include recommendations on topics listed in the guidelines for self-evaluation, including:

- The goals, aims and mission statement of the evaluated academic unit and study programs
- The study program
- The academic faculty
- The students
- The organizational structure
- Research
- The broader organizational structure (school/faculty) in which the academic unit and study program operate
- The infrastructure (both physical and administrative) available to the study program
- Internal mechanisms for quality assessment
- Other topics to be decided upon by the evaluation Committee

5. The Recommended Structure of the Reports

Part A – General background and executive summary:

5.1 General background concerning the evaluation process; the names of the members of the Committee and its coordinator; and a short overview of the Committee's procedures.

5.2 A general description of the institution and the academic unit being evaluated.

5.3 An executive summary that will include a brief description of the strengths and weaknesses of the academic unit and program being evaluated.

Part B – In-depth description of subjects examined:

5.4 This section will be based on evidence gathered from the self-evaluation report and the topics examined by the Committee during the site visit.

5.5 For each topic examined, the report will present a summary of the Committee's findings, the relevant information, and their analysis.

Part C –Recommendations:

5.6 This section will include comprehensive conclusions and recommendations regarding the evaluated academic unit and the study program according to the topics in part B.

5.7 Recommendations may be classified according to the following categories:

- ***Congratulatory remarks and minimal changes recommended, if any.***
- ***Desirable changes recommended*** at the institution's convenience and follow-up in the next cycle of evaluations.
- ***Important/needed changes requested for ensuring appropriate academic quality*** within a reasonable time, in coordination with the institution (1-3 years)
- ***Essential and urgent changes required, on which continued authorization will be contingent*** (immediately or up to one year).
- ***A combination of any of the above.***

Part D - Appendices:

5.8 The appendices shall contain the Committee's letter of appointment and the schedule of the on-site visit.

6. The General report

In addition to the individual reports concerning each study program, the Committee shall submit to the CHE a general report regarding the status of the evaluated field of study within the Israeli institutions of higher education. The report should also evaluate the state and status of Israeli faculty members and students in the international arena (in the field), as well as offer recommendations to the CHE for standards and potential state-wide changes in the evaluated field of study.

We urge the Committees to clearly list its specific recommendations for each one of the topics (both in the individual reports and in the general report) and to prioritize these recommendations, in order to ease the eventual monitoring of their implementation.

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11/5/09 - Monday - 1st day of the visit of the Evaluation Committee – Chemical Engineering Department

Evaluation Committee meeting, room 206, 2th, Building 59.

Time	Subject	Participants	Research Area
09:30-10:00	Opening Session: The heads of the institution and department	Prof. Jimmy Weinblatt -Rector Prof. Yael Edan- Deputy Rector, Head of Quality Assessment System Prof. Ran Giladi - Deputy Dean	
10:00-11:00	Meeting with the academic head of the department	Prof. Mordechai Shacham -Head of the Department	
11:00-12:45	Meeting with senior faculty	Profs. Herskowitz, Korin and Landau	Advanced Materials, Catalysis, Fuel Cells,
		Profs. Gottlieb, Kost, Regev	Polymers, Biotechnology, surface and colloid chemistry
		Dr. Bernheim, Prof. Yerushalmi Rosen	Biophysics of the cytoskeleton, Surfaces and Interfaces
		Dr. Tsori, Dr. Gurka	Fluid Dynamics, Modeling of interfacial phenomena
	Representatives of the undergraduate and graduate admissions and teaching, promotions committees	Prof. Korin (former Department Head), Prof. Kost (undergraduate teaching and admissions, promotions), Prof. Regev (graduate teaching and admissions, nanotechnology program).	
12:45-13:30	Lunch	With Prof. Ran Giladi – Deputy Dean and Prof. Mordechai Shacham – Head of the Department	
13:30-13:45	Department's tour	Profs. Herskowitz and Landau	Blechner Center for Industrial Catalysis and Process Development Laboratories for catalyst preparation, characterization and testing
13:45-14:20		Profs. Korin, Regev and Shacham	Student Laboratories: Computer, Control and Chemical Engineering
14:20-14:30		Prof. Yerushalmi Rosen	Laboratory for Preparation and Characterization of Surfaces and Interfaces
14:30-14:40		Prof. Gottlieb	Reimund Stadler Minerva Center, Polymers and Rheology
14:40-14:50		Prof. Regev	Composite Materials Laboratory
14:50-15:00		Dr. Bernheim	Biophysics Laboratory
15:00-15:15		Profs. Korin, Bettelheim	Fuel Cells and Electrochemical Processes Laboratory
15:15-15:30		Prof. Kost	Laboratory for Biomaterials, Gene and Drug Delivery

15:30 – 16:15	Closed-door working meeting of the evaluation committee		

12/5/09 - Tuesday – 2nd day of the visit of the Evaluation Committee – Chemical Engineering Department

Time	Subject	Participants
09:30-10:15	Meeting with adjuncts*	
10:15-11:00	Meeting with Representatives of students*	About 8 students
11:00-12:00	Meeting with graduate students and junior academic staff*	About 8 students
12:00-13:00	Review of students' work/materials*	Mostly undergraduate students
13:00-13:45	Lunch and Closed-door working meeting of the committee	
13:45-14:15	Summation meeting with head of the department*	Prof. Mordechai Shacham -Head of the Department
14:15-14:45	Summation meeting with heads of the institution and of the department	Prof. Jimmy Weinblat-Rector, Prof. Yael Edan- Deputy Rector, Head of Quality Assessment System Prof. Ran Giladi - Deputy Dean

* The heads of the institution and academic unit will not attend these meetings.