Committee for the Evaluation of Chemistry Study Programs

Ben-Gurion University of the Negev
The Faculty of Natural Sciences
Chemistry Department
Evaluation Report

March 2012
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Chapter 1- Background

At its meeting on July 14, 2009, the Council for Higher Education (CHE) decided to evaluate the study programs in the field of Chemistry in higher education in Israel. The initial steps by CHE included the formulation of a self-evaluation study for each participating institution and the appointment of an evaluation committee consisting of:

- Professor Richard Eisenberg, Department of Chemistry, University of Rochester, Rochester, NY
- Professor Allen J. Bard, Department of Chemistry, University of Texas, Austin, TX
- Professor Tobin J. Marks, Department of Chemistry, Northwestern University, Evanston, IL
- Professor William L. Jorgensen, Department of Chemistry, Yale University, New Haven, CT
- Professor Joan S. Valentine, Department of Chemistry, University of California - Los Angeles, Los Angeles, CA
- Professor David Milstein, Weizmann Institute of Science, Rehovoth

Each of the committee members is a research active chemistry faculty member with broad disciplinary experience. Each non-Israeli member is a member of the U.S. National Academy of Sciences and is fully involved in all aspects of chemistry programs at the graduate and undergraduate levels.

The committee was assisted in its efforts by Ms. Alisa Elon, Coordinator of the committee on behalf of the Council for Higher Education.

Within the framework of its activity, the Committee was requested to submit the following documents to CHE:

1. A final report on each of the evaluated departments,
2. A general report on the state of the discipline in the Israeli higher education system, including recommendations to the CHE for standards and potential state-wide changes in the evaluated field of study.

The Committee’s letter of appointment is attached as Appendix 1.

The process was conducted in accordance with the CHE’s Guidelines for Self-Evaluation (of October 2009).

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1 Prof. Prof. Allen J. Bard was not able to participate in the visit to Ben-Gurion University of the Negev for personal reasons
**Chapter 2- Committee Procedures**

The Committee held its first meetings on June 12, 2011 during which it discussed fundamental issues concerning higher education in Israel, the quality assessment activity, as well as Chemistry study programs.

In June 2011, the Committee held its first round of visits and went to Ben-Gurion University of the Negev, Bar-Ilan University, and the Weizmann Institute of Science. The second round of visits was carried out in December 2011 with site visits to the Hebrew University, the Open University, the Ariel University Center of Samaria, the Technion Israel Institute of Technology, and Tel Aviv University.

This report deals with the evaluation of chemistry studies at the Chemistry Department at the Ben-Gurion University of the Negev.

In preparation of this report, the committee met with BGU administrators, senior and junior faculty, and students at the bachelors, masters and doctoral levels. The analysis given below reflects the results of those meetings coupled with information provided by BGU in its self-evaluation study.

The Committee's visit to the Ben Gurion University took place on June 13-14, 2011. The Committee thanks the management of the Ben Gurion University and the Chemistry Department for their self-evaluation report and for their hospitality towards the Committee during its visit at the institution.

The schedule of the visit is attached as Appendix 2.
Chapter 3-Executive Summary

Several points, which are included in the General Report by the Committee, and other points specific to BGU need to be addressed to maintain the positive momentum of the Department. While the growth in students and programs in BGU has been impressive, and 11 new hires have been made in the last 5 years, the number of full-time faculty in Chemistry has not grown in a commensurate manner due to retirements and the untimely passing of several faculty members. The increase in student enrollments without a corresponding increase in the faculty has created a situation that needs both short- and long-term planning with a significant commitment of resources to complete the process successfully.

There is envisioned planned growth in faculty size and plans for a new Chemistry building that will house the department's research groups. The research budget for the Chemistry Faculty has grown substantially in the last five years, from $1166 K in 2006 to $1882 K in 2009 with a more than 250% increase in competitive funding. The space situation at present is critical, as there is very little room to add new faculty members before the new building is constructed. Short-term planning must therefore be formulated to go hand-in-hand with long-term objectives to allow the department to continue the positive trajectory in the near term that has been initiated with several successful new faculty appointments.

The Committee recommends changes in the requirements for undergraduate and graduate programs to promote more research and active learning in the undergraduate degree program, and to facilitate and streamline the path to the Ph.D. degree at the graduate level. For the former, more undergraduate research and reduction in the number of formal courses is advocated, while for the latter, the Committee advocates that students beyond the first degree enter the "Direct to Ph.D. program".

Other specific Committee recommendations:

- All frontal chemistry courses at BGU should be taught by Chemistry Department faculty. Use of larger lecture halls to reduce duplication of large-audience introductory chemistry lectures should be done.
- Undergraduate chemistry instructional laboratories should be remodeled.
- Increase faculty involvement/presence in undergraduate laboratory courses.
- Provide career counseling and expose students to industrial chemistry and I.P. concepts. The latter could be done via visiting speakers, tours of industrial facilities, and internships for students in industrial laboratories, law firms, and venture capitalists.
- Efforts to reduce the teaching load of doctoral students while maintaining their levels of support should be made.
- Career counseling for finishing students at all levels is recommended.
- Ph.D. students should be assigned faculty committees for periodic feedback throughout their programs.
- More support for Ph.D. students through grant funds is recommended in order to reduce their teaching hours and increase their research efforts.
- Representation of synthetic organic chemistry on the faculty should be increased.
- Planning for laboratory space for near-future new faculty members is urgently needed; creation of laboratory space may require consolidation of less active senior faculty laboratories.
- Construction of a new building should be given top priority; existing plans for the new building should be reviewed in light of current and future needs. The Committee is concerned that the estimated cost of $20M is not sufficient for a building that will house 25 research groups of the Department.
• Refurbishment of the organic teaching laboratories is needed.
• Purchase of an additional high field NMR spectrometer (700-800 MHz) for biological research is desirable.
• Staff scientists for coordinating, training and running both the NMR and X-ray facilities are strongly needed.
• Extra effort should be made to have the laboratories and equipment of new faculty members ready before they begin employment.
• A special fund, possibly in the form of an endowment, for instrument repair needs to be created.
Chapter 4: Evaluation of Chemistry Studies at the Chemistry Department at the 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 subsequent changes. 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.

Background

The mission of Ben Gurion University (BGU) is "to constitute a scientific, educational and cultural center in Israel and to assist in the development and advancement of the State of Israel, particularly the Negev." The Faculty of Chemistry in BGU was one of the initial departments when the university was started as the University of the Negev in 1970. A cohort of faculty now at or nearing retirement age were hired at that time to teach and do research in Chemistry. The Faculty is thus in transition as new faculty members have been hired, and will continue to be hired, while "founder" faculty members retire.

From 1995/6 to 2009/10, university enrollments increased from 11,000 students to 18,000 students. There are 22 active faculty members engaged in teaching and research, and 4 emeriti who may occasionally teach a course, plus several adjunct lecturers who normally teach 1 course per semester. The size of the chemistry faculty has remained more or less constant for 20 years during which time the enrollment in the university has roughly tripled. Research today is conducted in the traditional areas of organic, inorganic and physical chemistry, as well as in the interdisciplinary areas of chemical biology and nanotechnology.

The general impression given to the Committee during the visit was of an expanding program with new talented faculty at the junior level and a growing student enrollment. The situation requires both long- and short-term planning because of important needs in both faculty hiring and physical facilities during a time of potentially constrained resources.

Undergraduate Program

The Ben-Gurion Chemistry Department provides a rigorous, high quality chemistry program for chemistry students. Within the last several years the faculty at BGU has revised the undergraduate curriculum program for its students so that they can follow one of three different tracks. The revised program has been received positively by students. The three tracks are: (1) Biophysical chemistry, (2) Nanoscience/Nanotechnology, and (3) Synthesis. The three different tracks really commence only in the third and final year of Bachelors' studies after all chemistry students have taken the same core courses. For the third year, several new courses have been developed that address important topics in each of the tracks.

Additionally, some students are able to undertake research projects that further their transition to functioning scientist and allow them to experience the excitement of investigative research. Such efforts also stimulate students to continue study in Chemistry for advanced degrees while giving them the opportunity to choose the specific area of research that they would like to engage in. The research experience for undergraduates is
favorably viewed by the Committee, which recommends that it be made available to more students. Faculty presentations of their research to undergraduates should be given annually, and opportunities for summer undergraduate research experiences increased. A capstone event such as Departmental undergraduate research poster sessions or undergraduate honors theses based on undergraduate research should be introduced. In the same vein, programs are needed (not necessarily courses) that expose undergraduates (and graduate students) to career options in chemistry and allied fields such as exposure to industrial chemistry and chemists, and to I.P. concepts. This could include visiting speakers, tours of facilities, and internships for students in industrials laboratories, law firms, and venture capitalists.

Chemistry is a foundational subject that is taken by students in other BGU departments as part of their degree requirements. The committee views with concern that the teaching of chemistry in these frontal chemistry courses for other disciplines such as medicine, biotechnology and engineering is being done by teaching staff who are not members of the Chemistry faculty or who do not have certified training in chemistry. The Chemistry faculty is most knowledgeable about the foundational concepts and systems that need to be taught in such courses.

The Chemistry Department's teaching program is stressed by the lack of large lecture halls so that multiple sections of frontal lecture courses must be taught. This situation increases the Department teaching burden, which in turn makes it difficult to teach sufficient elective and special topics courses that would enhance both undergraduate and graduate education. With regard to the laboratory curriculum, the poor state and capacity of the existing facilities as well as the shortage of teaching assistants means that this essential part of BGU chemistry instruction does little to attract students to a chemistry program or deliver adequate knowledge of experimental skills and concepts. The Committee also felt the introduction of new computer and peer-learning methodologies could be used to enhance student learning in large lecture courses, while further implementation of qualified undergraduate teaching assistants could help relieve the shortage of laboratory and tutorial graduate teaching assistants in a cost-effective manner. The effectiveness of the laboratory instruction would also be enhanced by greater faculty involvement on a day-to-day basis.

The Chemistry Department is to be commended for efforts to institute a "crash" course for new undergraduates returning from military service to familiarize themselves with material previously learned but possibly forgotten during the years of military service. This initiative should possibly be expanded over a longer term to reacquaint students with the methodology of learning as well as with the specific material presented in secondary mathematics, chemistry and physics. With regard to feedback on teaching quality, faculty members and the Department should be more responsive to the results of teaching surveys polling student opinions.

Recommendations

- All frontal chemistry courses at BGU should be taught by Chemistry Department faculty.
- Use of larger lecture halls to reduce duplication of large-audience introductory chemistry lectures should be done.
- Remodelling undergraduate chemistry instructional laboratories is needed.
- Introduce computer and peer-learning methodologies to enhance learning in large lecture courses.
- Use additional qualified undergraduate teaching assistants.
- Increase faculty involvement/presence in undergraduate laboratory courses.
• Encourage undergraduate research during the academic year. This objective can be stimulated through presentation of faculty seminars to expose students to research opportunities. Students should also be made more aware of available tracks.
• Introduce greater flexibility into the undergraduate curriculum to allow students to take courses in other departments, and offer chemistry courses or other experiences that expose students to industrial chemistry and chemists, and to I.P. concepts. This effort could include visiting speakers, tours of industrial facilities, and internships for students in industrial laboratories, law firms, and venture capitalists.

Graduate Program

The graduate program at Ben-Gurion is strong. Good students are increasingly attracted to the department not only because of the quality of the academic program but also because of the low cost of living in the area, the vitality and vibrancy of the younger faculty, and the impressive esprit de corps of the student body of the Department.

At present, the graduate students work in research labs in several different buildings. Therefore, special efforts should be made, in advance of a new chemistry building, to foster social gatherings and/or other events (preferably with free food) that bring graduate students from different research groups together so that they can interact more both socially and scientifically.

With respect to course offerings for graduate students, the Department recognizes that it needs to strengthen and enhance its graduate course offerings. We endorse their plan to offer new 2-hour courses on a 2-year cycle to address this problem.

The teaching load for graduate students is on average too heavy, with the result that graduate students, while hard working, may not have sufficient time to devote to their research. Some combination of scholarship support (from the university) and research assistantships (from research grants, when available) should be used to supplement the salary support obtained from teaching for each of the graduate students.

M.Sc. and Ph.D. students should, upon admission to their programs, be guaranteed in advance, a minimal level of financial support for a set number of years. It need not be specified in advance where the funds will come from (i.e., what combination of teaching assistantships, scholarships, and research assistantships), but the students need to be assured that they can count on certain minimum levels to enable them to plan their lives and the lives of their families. In the case of a female student who has a baby, there should be flexibility available in academic deadlines when necessary, and efforts should be made to obtain financial support for them, as needed, during the time period in which they are unable to work full time.

Ph.D. students should be assigned faculty committees early in their programs, and a system should be implemented to ensure that they receive periodic feedback on the progress of their research from members of their committee.

A concern expressed widely in the Committee's different meetings regarded the large number of required course credits in graduate education (for clarification, the courses are generally electives but the course credits are required) and the time for finishing the doctoral program. The formal course credits together with teaching obligations at most institutions (and with family obligations for many of the students) often result in the
M.Sc. program requiring 2.5-3.5 years for completion, rather than the allotted two years, and the Ph.D. program requiring 4.5-5.0 years (or longer) rather than the allotted four years. The net result is that the time from entrance into the M.Sc. program until Ph.D. completion stretches from the programmed six years to more than seven years to complete.

The Committee regards this length of time as too great and believes that it can be shortened significantly (>1 year) by elimination of some formal course credit requirements and more general adoption of the "Direct to Ph.D." program that all universities have. At present, the "Direct to Ph.D." program is open to students above a high grade point cut-off or possibly after the first term of the Master's program. The Committee believes that the "Direct" path should be more generally adopted. For a graduate student body that commences studies at a more senior age than their American or European counterparts, the reduction in time to the Ph.D. degree by 1 or more years is important.

A program should be implemented to expose graduate students to the wide variety of career options that are available in chemistry and allied fields. One way to do this is to institute a program where alumni are invited back to give talks and meet with student. Career counseling for finishing students at all levels is recommended, and the proposal given above is just one way (but an attractive one) to accomplish this goal.

**Recommendations**

- Efforts to reduce the teaching load of doctoral students while maintaining their levels of support should be made
- Students should be encouraged to enroll in the "Direct to Ph.D." and criteria for enrollment should be more flexible.
- Sufficient elective courses that are relevant to particular graduate research programs should be offered. Plans to initiate different 2 credit courses in alternate years should move forward quickly.
- Career counseling for finishing students at all levels is recommended
- Ph.D. students should be assigned faculty committees for periodic feedback throughout their programs
- M.Sc. and Ph.D. students should, upon admission to their programs, be guaranteed in advance a minimal level of financial support for a set number of years
- There should be financial support and flexibility in academic deadlines for female students who have children

**Faculty**

The Chemistry Department is one of the six departments in the Faculty of Natural Sciences. There are 22 active faculty members engaged in teaching and research, and 4 emeriti who may occasionally teach a course, and several adjunct lecturers who normally teach 1 course per semester. The size of the chemistry faculty has remained more or less constant for 20 years during which time the enrollment in the university has roughly tripled. The resultant large demands for undergraduate teaching place limitations on the availability of more specialized graduate course offerings, which was a repeated theme among both the graduate students and faculty. Thus, growth of the faculty is overdue; however, there have been practical constraints owing to the lack of unassigned research space. Fortunately, there are plans and the commitment of the administration for a new chemistry building that could hopefully house 25 research groups. An additional 2-3 chemistry groups would continue to reside in the NanoScience Institute.
There is a good mix of junior and senior faculty that is marked by excellent recent appointments. Continuing new hires are possible owing to 5-6 anticipated retirements in the next 4 years. The startup packages for new faculty have been excellent reflecting a basic philosophy of the administration of positioning the new faculty for success. The details of the packages are tailored to the needs of the individual and may range in size from $200K to more than $1M. These figures are competitive with those at top universities worldwide. The new faculty also benefit from the predominant support of most graduate students through teaching fellowships, thereby reserving their startup funds for instrumentation and supplies. New faculty have also benefited from successful applications for grants targeted to new investigators. Shared major equipment is also generally adequate, although the department lacks a high-field NMR spectrometer in the 600-900 MHz range, which limits research in structural biology and aspects of materials science.

BGU Chemistry faculty members are all research active with group sizes typically of 4-10 graduate students. The total number of postdoctoral researchers is small, ca. 20. An increase in this area is desirable, though it is hindered by the availability of appropriate grant funds and the relatively isolated location of the university. As the faculty is increasingly successful with research funding, the situation may resolve itself. The faculty may also find it desirable to provide more support for Ph. D. students through grant funds in order to reduce their teaching hours and to focus more on research activities.

The faculty members at BGU have a full teaching load (6 hours per semester with 2 hours more for supervising research students). Application of the full load to new faculty members is particularly burdensome in conjunction with the demands of initiating their research programs and application for associated grants. However, it is the consensus that supervising a laboratory course may not be as time or effort consuming as a lecture course. Thus, assignment of greater numbers of lab supervision courses to new faculty members provides some flexibility in effectively reducing their overall teaching loads. The senior faculty needs to be sensitive to this issue.

The tenure and promotion process is reasonable, including the timeline for decisions. The process is not viewed as problematic, though the junior faculty would benefit from senior-faculty mentorship and clarity on expectations. Appropriate delays of the tenure clock for family leave are in place. Some consideration should also be given in the case that a new faculty member has experienced delay in the availability of research space.

The recruitment process for new faculty appears to be largely ad hoc. For the most part, candidates with a Ph.D. from an Israeli university apply for a Senior Lecturer position after a postdoctoral appointment. There appears to be little effort to make openings known to the broader, international community through, for example, advertising in international journals or contacting foreign scientists for suggestions. This tends to make the applicant pool mirror the research emphases that already exist in Israel. For example, there is a need to increase the representation of synthetic organic chemists on the BGU faculty, but it is difficult to do this if the applicant pool comes predominantly from Israeli universities in which the field is under-represented. While recognizing the special circumstances in Israel, the Committee recommends casting a broader net in faculty recruiting. Currently, the approach is largely ad hoc and confined to Israeli Ph.D.’s who apply after a postdoctoral experience abroad. Announcement of faculty openings in international journals such as *Science* and *Nature* should be considered along with notification of distinguished scientists in the field, who may have current or former co-workers to recommend.
In this vein, pro-active recruitment of female faculty members should be made in view of the fact that only 10% of the Chemistry faculty are female, while more than 50% of the graduate students are female.

**Recommendations**

- As noted above in the Undergraduate section, all frontal chemistry courses at BGU should be taught by Chemistry Department faculty
- More support for Ph.D. students through grant funds is recommended in order to reduce their teaching hours and increase their research efforts
- Assignment of lab supervision courses to new faculty members is recommended to effectively reduce their overall teaching loads
- Representation of synthetic organic chemistry on the faculty should be increased

**Research**

The chemistry department is in a period of rapid transition. It consists of excellent young faculty and soon to retire faculty. 11 new faculty members were recruited in the last five years. Mid career faculty are largely absent. Four young faculty members were recently promoted to full professors and can assume leadership.

The department has experienced a significant increase in scientific output in recent years. The 22 non-emeritus faculty members cover a broad range of fields, including organic, inorganic, and physical chemistry as well as newer fields of chemical biology, systems chemistry, nanotechnology and environmental chemistry. The young faculty members are commendably productive, with publications in top peer-reviewed journals. They have been successful in securing appropriate funding for their research. Three young faculty members were recently awarded the highly competitive ERC starting grants (approx $2M/5yrs), which is quite unusual for a single department anywhere in Europe, attesting to the excellence and cutting edge research conducted in the Department.

Considering upcoming retirements of several faculty members, it is necessary to proactively recruit additional excellent young and mid-term faculty. In particular, organic, organometallic and analytical chemists are in strong need.

The research groups in the Department are primarily composed of 4-10 graduate students, with only few post doctoral fellows. While it is difficult to find capable post docs, partly due to the remote location and the lack of a local international community, it is expected that enhanced funding and reputation of the faculty members will help resolve this situation. Advertising might also help.

Regarding student research, heavy teaching load of TA’s negatively affects their research. In groups where sufficient grant money is available, it is recommended to reduce the teaching load of the graduate students and supplement their salary. In addition, it is suggested to offer TA positions for excellent undergraduates.

In talking with several undergraduate students, we have realized that they are not familiar enough with the diverse research projects available to them in the department. It is recommended to have a session to explain this to them. This desirable experience can familiarize them with research activity and will help them chose a suitable research group for their graduate studies.
**Recommendations:**

- Proactive recruitment of young and mid-career faculty should be given high priority; new hires in synthetic organic and/or organometallic chemistry, and analytical chemists are essential.
- Reduce graduate student teaching loads to increase research efforts of Ph.D. students; this may be done by offering TA positions to excellent undergraduates, and by supplementing the fellowships of graduates student with grant funds.
- Familiarize undergraduate students with the possibilities of research projects.
- Advertise available post doctoral positions and increase the number of postdoctoral researchers through additional grants.

**Resources, Facilities**

A major problem exists in that there is no current laboratory space for new faculty. This situation will be rectified to some extent when older laboratory facilities are renovated but this will take 2-3 years. Short-term planning is essential so that the process of faculty recruiting can continue. As noted above, the creation of temporary laboratory space may require consolidation of less active senior faculty laboratories. The Chair and Dean need to work together to develop a viable plan for this process.

A new chemistry building is planned, although sufficient funds are currently not available. The Rector views a new Chemistry Building with high priority and he is seeking a donor. The building is essential for the Faculty's success, but it will take several years to build. The current plan is to house all Chemistry research groups, except for those currently located in the Nano Science Building, in the new Chemistry building. However, the plans should be reviewed because the estimated cost of $20 M to proceed with the plan seems too low for 25 faculty members and their research groups. The plans should be reviewed regarding cost and size, and movement forward should be given top priority.

Another major deficiency regarding facilities relates to the organic teaching laboratories. Both faculty and students express concern about the facilities based on safety issues. There exists a lack of hood space for modern teaching laboratories, and students and faculty complain about students having to work in pairs because of insufficient laboratory bench space and set-ups. There is also asbestos in the back panels of the hoods that is desirable to replace (such replacement may prove costly).

With regard to research instrumentation, an additional high field NMR spectrometer would be of value although its acquisition is not of highest priority. NMR service is provided by a technician (in addition to hands-on operation by trained students), but no faculty member is in charge. Additionally, an X-ray diffractometer for small molecule crystallography is only occasionally functional due to maintenance problems. The faculty member responsible for the diffractometer (Emeritus Prof. J. Bernstein) is in Abu Dhabi, so the facility receives relatively little priority for maintenance. It would make sense to have full-time staff scientists for coordinating and running both the NMR and X-ray facilities. Both methods are essential to any research program in molecular science.

While group instrumentation is adequate, faculty members have mentioned that there are no funds for instrument repair. Establishing of a special fund for this purpose is needed.
While the start-up funds for new Faculty are very good (and competitive with top-line institutions), mainly for equipment, chemicals and consumables, it was pointed out that in at least one case the funds needed to be expended in a very short amount of time. This expenditure timeline caused significant problems. Additionally, laboratories for new faculty are often not ready when they arrive, even though they are asked to apply for research grants several months before arrival. All have start-up funds and some have grant money that they would like to use upon arrival, but the absence of their laboratories may preclude this. There also needs to be flexibility in the use of start-up funds during the first two years in case grant applications are not successful and grant money for personnel support is not available.

Since the Chemistry Department occupies two separate buildings (+ two groups in Nano), faculty and students, which occupy different buildings rarely meet. It is recommended to generate more opportunities to meet, such as in social gatherings

**Recommendations:**

- Planning for laboratory space for near-future new faculty members is urgently needed; creation of laboratory space may require consolidation of less active senior faculty laboratories.
- Construction of a new building should be given top priority; existing plans for the new building should be reviewed in light of current and future needs. The committee is concerned that the estimated cost of $20M is not sufficient for housing 25 research groups of the Department.
- Refurbishing the organic teaching laboratories is needed.
- Purchase of an additional high field NMR spectrometer (700-800 MHz) for biological research is desirable
- Staff scientists for coordinating, training and running both the NMR and X-ray facilities are strongly needed
- Extra effort should be made to have the laboratories and equipment of new faculty recruits ready before they begin employment.
- The University or the Department should provide bridging funds for new faculty members that have not secured grant funds yet.
- A special fund, possibly in the form of an endowment, for instrument repair needs to be created.
- Generate opportunities for faculty members and graduate students to meet and socialize, as a means of exchanging ideas and promoting interaction.
- Have full-time staff scientists for coordinating and running both the NMR and X-ray facilities.
Signed by:

Prof. Richard Eisenberg
Committee Chair

Prof. Tobin J. Marks

Prof. Joan S. Valentine

Prof. William L. Jorgensen

Prof. David Milstein
Appendices
Appendix 1 - Copy of Letter of Appointment

March, 2011

Prof. Rich Eisenberg
Department of Chemistry
University of Rochester
USA

Dear Professor Eisenberg,

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 scientists in the international arena in a national effort to meet the critical challenges that confront the Israeli higher educational system today. The formulation 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 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 the chair of the Council for Higher Education's Committee for the Evaluation of Chemistry Studies.

The composition of the Committee will be as follows: Prof. Rich Eisenberg (Chair), Prof. Allen Bard, Prof. William Jorgensen, Prof. Tobin Marks, Prof. David Milstein and Prof. Joan Valentine.

Ms. Alisa Elon 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 chair of this most important committee.

Sincerely,

Gideon Sa'ar
Minister of Education,
Chairperson, The Council for Higher Education

Enclosures: Appendix to the Appointment Letter of Evaluation Committees

cc: Ms. Michal Neumann, The Quality Assessment Division
Ms. Alisa Elon, Committee Coordinator
## Appendix 2- Site Visit Schedule

**Monday, June 13, 2011:**

<table>
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<tr>
<th>Time</th>
<th>Subject</th>
<th>Participants</th>
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| 09:30-10:00  | Opening session with the heads of the institution and the senior staff member appointed to deal with quality assessment | Rector- Zvi Hacohen  
Deputy Rector-Yael Edan  
Dean- Amir Sagi  
Dept. Chair- Yehuda Band |
| 10:00-10:30  | Meeting with the heads of the Faculty of Natural Sciences                | Dean- Amir Sagi                                                             |
| 10:30-11:15  | Meeting with the heads of the Department of Chemistry                    | Chair- Yehuda Band                                                          |
| 11:15-12:15  | Meeting with Senior Academic Faculty* + representatives of relevant departmental committees* | Teaching Committee (M.Sc+Ph.D studies): Gonen Ashkenasy; Ashraf Brik; Leah Gheber  
Teaching Committee (B.Sc studies): Gabriel Lemcoff, Iris Viosly-Fisher  
Admission Committee (B.Sc studies): Raz Jelinek  
Department Committee: Ira Weinstock, Abraham Parola, Taleb Mokari, Amichy Vardi |
| 12:15-13:00  | Meeting with Junior academic faculty*                                   | Iris Viosly-Fisher; Emmanuel Tennenbaum; Taleb Mokari, Eyal Nir; Doron Pappo |
| 13:00-13:45  | Lunch (closed working meeting in the same room)                         |                                                                             |
| 14:00-14:30  | Closed door working meeting of the Committee                            |                                                                             |
**Tuesday, June 14, 2011:**

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<tr>
<th>Time</th>
<th>Subject</th>
<th>Participants</th>
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<tbody>
<tr>
<td>10:00-10:30</td>
<td>Meeting with adjunct lecturers*</td>
<td>Chayim Cohen, Nella Pross, Emmanuel Manzuronl, Amos Ben Asuly</td>
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<tr>
<td>10:30-11:15</td>
<td>Meeting with B.A. students</td>
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<td>11:15-12:00</td>
<td>Meeting with M.A. students</td>
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<td>12:00-12:45</td>
<td>Meeting with PhD students</td>
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<tr>
<td>12:45-13:30</td>
<td>Lunch (closed working meeting)</td>
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<td>13:30-14:15</td>
<td>Meeting with Alumni</td>
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<tr>
<td>14:15-15:45</td>
<td>Tour of campus</td>
<td>Prof. Michel Meijler, Dr. Taleb Mokari, Dr. Eyal Nir, Prof. Organic Chemistry Lab, Physical Chemistry Lab, General Chemistry Lab, General &amp; Analytical Lab. Dr. Gonen Ashkenasy will guide the tour</td>
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<tr>
<td>15:45-16:15</td>
<td>Closed-door working meeting of the evaluation committee</td>
<td></td>
</tr>
</tbody>
</table>
| 16:15-16:45 | Summation meeting with heads of the institution and of the faculty and department. | Rector- Zvi Hacohen  
Deputy Rector-Yael Edan  
Dean- Amir Sagi  
Dept. Chair- Yehuda Band |