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**Comments of the Faculty of Civil and Environmental Engineering
Technion, Israel Institute of Technology
on the
Evaluation Report of the Committee
Appointed by the
Council of Higher Education**

Evaluation report: September 2011

Mission and goals

Recommendations of the evaluation committee

Intermediate:

- Include a stronger mandate to attract international students to study at the Faculty.
Comment: It is not clear what is meant by a stronger mandate. The CEE faculty has a mandate to act and expand the program. However, expanding the program to more CEE students than currently join the program (approximately 30 per year) will require more resources and means to overcome barriers, especially means to attract faculty to teach in the program beyond their usual duties, as well as dormitories to house the international students on campus. We are working with the management to provide such incentives, especially within the next step which is currently underway to position the international program as a Technion wide program, beyond just CEE.
- Initiate steps that will help attract international world class faculty members to the international program.
Comment: Attracting English speaking faculty to teach only at the international program may create segregation between the level of teaching in the Hebrew and English programs. A discussion with regards to a step in this direction has been initiated. However, as noted above the implications of such a step are not clear cut and need in-depth considerations and discussions.
- Take a leadership role in expanding civil engineering education at other academic institutions in Israel. This can take the form of research workshops for civil engineering academic faculty from other institutions whereby the results of the latest research at the Technion are presented, teaching methods workshops at the Technion or at other institutions for civil engineering and/or invitations to academic staff from other institutions to participate in joint research projects with Technion faculty.
Comment: This is obviously a constructive suggestion, yet its implementation is complex in view of the teaching and research load on the faculty members, especially when the CEE Faculty is under-staffed while being required to participate in special programs such as the International School, the program in Jerusalem and the newly formed program for the ultra-orthodox sector.

Study Program

The Faculty welcomes the positive comments of the evaluation committee:

- “These programs are all at the highest quality and combine both the theoretical and practical in a series of classroom and laboratory experiences. The programs associated with environmental engineering seem to be particularly strong and have clearly benefited from the synergies associated with the merger of the civil and agricultural engineering faculties in 2002.”
- “The Faculty of Civil and Environmental Engineering has an impressive and innovative research plan that is based on a systems approach (as detailed in "Research").

- “Finally, the Faculty of Civil Engineering took the lead in the formation of Technion’s International School of Engineering. This English language program has a great potential and the committee encourages its expansion.”

Recommendations of the evaluation committee

Immediate:

- Encourage curriculum modifications allowing more required courses to be shared among different faculties, allowing reductions in teaching loads for academic staff in Civil and Environmental Engineering e.g. with Mechanical, Aerospace, Materials and Industrial Engineering and Management

Comment: This is a positive comment which we will bring to the attention of the study program committees which are currently re-evaluating the curricula in light of the comments of this committee.

Intermediate:

- Increase Ph.D. student production to maintain a world-class, research-intense academic institution and an adequately large cohort of researchers

Comment: This issue has been given attention even before the visit of the committee, especially in the area of structural engineering and construction management. Evaluation of the causes for low PhD numbers is underway. Yet, it should be noted that this issue is to a large extent the result of the current practice in Israel where structural engineers are given license to practice based on their BSc studies and have no incentive for taking advanced graduate studies unless they want to develop an academic career. We anticipate that the advancement of an English speaking program will provide the basis for more international graduate students.

- Appoint an Academic Head whose primary responsibility would be the International School of Engineering.

Comment: From the onset of the international program an academic head was appointed to deal with the CEE program as well as being in charge of developing programs in other faculties. Now, that the first step has been accomplished successfully, the management will appoint an academic head starting January 2012 who will report directly to the management and will have responsibility to develop the program in other Technion Faculties. Steps towards that goal are already underway and 8 Technion Faculties have agreed to develop study abroad programs for one or two semester study periods in English.

Students

The Faculty welcomes the positive comments of the evaluation committee:

- “The committee’s impression was that the teachers were accessible and overall the students have positive feelings about the majority of instruction provided.”

- “The B.Sc. and M.Sc. students made a good impression on the committee and the committee believes they would be competitive with students in other leading programs throughout the world.”

Recommendations of the evaluation committee

Immediate to intermediate:

- Supply structured training to help T.A's improve classroom teaching and related skills
Comment: training to TA's is given routinely. In light of this comment the training program will be re-evaluated.
- Encourage students to take courses from different faculties
Comment: this is encouraged on a limited basis and in view of this comment it will be further evaluated by the study program committees, as noted above.
- Attract non Hebrew speaking faculty into international program in particular in graduate course offerings
Comment: This issue was already brought up in discussions at the Faculty level and at the Technion level. There are pros and cons which can be considered and discussed. The positive aspects are quite clear: a base for attracting international staff and providing them with teaching assignments in addition to research. The negative aspect is mainly the implication of a dual teaching system, with one type of teaching to Israeli students and another one for the international. This may detract from the attractiveness of the International program and create two levels of programs which is an unhealthy situation. To many it seems that the cons outweigh the pros and that faculty members recruited should be (on top of their excellence) able to be involved in the teaching of the Hebrew as well as the English programs.

Teaching and Learning Outcomes:

The Faculty welcomes the positive comments of the evaluation committee:

- “During its meetings with undergraduate and graduate students, the committee received a largely positive feedback on the quality of student interactions with the academic staff of the Faculty. The committee believes that the quality of teaching across the Faculty is high and that the instructional staff is highly competent in their technical specialties.”

Recommendations of the evaluation committee

Intermediate:

- Plan for an update to the undergraduate curriculum to reflect the evolving needs of the civil and environmental engineering profession
Comment: This comment is unclear to us, and apparently inconsistent with one made by the committee earlier in its report - “These programs are all at the highest quality and combine both the theoretical and practical in a series of classroom and laboratory experiences.” It is also inconsistent with a statement made lately by an international evaluation committee for the faculty appointed by the Technion, namely: “The undergraduate engineering education in CEE is more comprehensive than that offered by comparable institutions and as a consequence the engineers

graduating from the Faculty are excellently prepared for careers in industry, government organisations and graduate studies“

- Consider an increase in the number and breadth of specialized curricular offerings at the graduate level including opportunities for individualized independent study in lieu of traditional classroom lectures

Comment: the current graduate programs are loaded (and to some extent “overloaded”) with specializations. Thus, it is not clear to us what the committee meant in this recommendation. We have room in the programs for independent studies, but this is only for specialized topics. We are not convinced that formal independent study on a large scale is the right way to go.

- Standardize the level (but not necessarily the content) of fourth year final design experience for all undergraduate academic specialties in the Faculty to insure adequate exposure among these specialties to engineering design issues

Comment: this issue was not discussed with us, but we will review again whether there is indeed a difference in the requirements in the design projects within the various study programs

Human resources

Recommendations of the evaluation committee

Immediate:

- Provide T.A's with adequate facilities and resources
Comment: not clear - are these research or office facilities? We are aware of a few cases where some TA's situated in the Borowitz building complain about office facilities and availability of computers and communication. These issues have been addressed. Further considerations will be made in light of this comment.

Intermediate:

- Appoint more academic staff into the Structural Engineering program, particularly in areas which broaden the scope of traditional Structural Engineering specialties and research activities.
Comment: we are well aware of this issue and are actively seeking candidates. International calls for candidates have been posted.

Organization

The Faculty welcomes the following comments of the evaluation committee with respect to the achievements of the Faculty and the need for actions of the Technion management to make these achievements sustainable:

- “The International Program is a positive new program that can move the Faculty and the whole institution towards fulfilling a part of their mission and goals.”
- “Some means of recognizing the Civil Engineering faculty for the establishment of this program should be developed, as well as providing some incentives to the program faculty, at least until the program reaches the stage of self-sustainability.”

Recommendations of the evaluation committee

Immediate:

- Simplify the committee structure and decision making process for screening and selecting the new candidates for appointment to academic staff ranks
Comment: There is a need to follow the Senate rules where the approval for recruitment requires letters of evaluation by 6 to 8 international experts to be discussed in the Faculty preparatory committee. This can take some time, especially receiving the letters. Once the approval at the Faculty level has been made, a formal offer can usually be issued within a week or two by the Technion management.

Intermediate:

- The International Program should report to the central administration at Technion with consideration for oversight at the level of an international programs' Dean or equivalent
CEE comment: the head of the International School (currently also the Dean of CEE) is reporting directly to the Technion management on all the issues, and in this capacity the International School has actively recruited 8 additional Technion Faculties and formed an academic committee of these 8 partners.
Management comment: the Technion management concurs with the recommendation and is considering its immediate implementation.
- Develop incentives and recognition for the Civil Engineering faculty of The International Program
CEE comment: Some fund raising projects have been given higher priority and have resulted in renewal of some labs, especially in environmental engineering and transportation infrastructure. However, since we are in a period where fund-raising is difficult, the faculty feeling is that it was not appropriately rewarded. Of some concern for the Faculty is that within the limited freedom with which the Technion management can act on a regular basis, no real action was taken and cuts have been imposed. There is a growing concern that faculty members will shy away from teaching in the school. This situation and its consequences have been discussed with the Technion management, but so far with no real success. On the contrary, the CEE Faculty is continuously struggling, unsuccessfully, to prevent cuts in its budget, and this is especially frustrating in view of the fact that in recent years its activities have grown dramatically: an increase in the Israeli student body by about 50% and doubling the level of the externally funded research.
Management comment: The Technion management is cognizant of the important positive developments in CEE. The CEE portion of the annual operating budget grew by 5.9% from 2009/10 to 2010/11 while the Technion operating budget itself grew by 3.1% over the same period.

Research

The Faculty welcomes the positive comments of the evaluation committee:

- “This confirmed that Technion was well-placed amongst peer civil engineering departments at various highly regarded universities in Europe and North America.”

- “The Faculty of Civil and Environmental engineering has an impressive and innovative research plan that is based on a systems approach.”

Recommendations of the evaluation committee

Immediate:

- Consider academic staff recruitment and appointment from related cognate disciplines and thus diversify research into non-traditional areas. This can be accomplished through a combination of direct new hires and joint/courtesy academic staff appointments among different faculties at Technion, e.g. with Mechanical, Materials, Chemical, and Industrial Engineering

Comment: we welcome this comment and steps have already been taken in this direction recently, to recruit faculty members whose background is in mechanical engineering and electrical engineering. Some faculty members have concerns that such a move will have a negative effect on the commitment of the faculty to the core of civil and environmental engineering, and thus, the proportion of such recruitments should be well balanced.

- Intensify efforts to recruit larger cohorts of new doctoral-level students, particularly for the Structural Engineering and Management Division

Comment: this is well appreciated and efforts are already under way. This issue has been addressed previously in this document and is reiterated again: “This issue has been given attention even before the visit of the committee, especially in the area of structural engineering and construction management. Evaluation of the causes for this low level of PhD’s and MSc’s students is underway. Yet, it should be borne in mind that this issue is to a large extent the result of the current practice in Israel where structural engineers are given license to practice based on their BSc studies and have no incentive for taking advanced studies unless they want to develop an academic career. Perhaps the advancement of the English speaking program will provide the basis for more international graduate students”

- Encourage interdisciplinary collaborations between other engineering faculties within Technion. Consider, in particular, academic staff from other faculties such as Mechanical Engineering, Materials Engineering, Aerospace Engineering, Chemical Engineering/Chemistry, and Industrial and Systems Engineering.

Comment: enhancement of interdisciplinary actions has already been addressed seriously, including establishment of virtual interdisciplinary research centres generated through CEE initiatives, as well as a joint Faculty of Medicine-CEE interdisciplinary excellence research centre in Environment and Health. Fund raising projects have been set for establishing the infrastructure needed for these centres; some partial funding is already available. Much more fund raising effort is required.

Intermediate:

- Monitor performance and operational statistics of the faculty members’ publications cited world-wide and employ strategies to address potential concerns in this regard.

Comment: such monitoring is done routinely in the follow-up for promotion. It has not been done routinely on a Faculty level, and the first time it was implemented and compared with other leading departments was in preparation for the

evaluation process. It will be recommended to follow up on that initiative, as suggested by the evaluation committee. However, caution should be taken with treating such statistics as a major tool for evaluation, to make sure that we will not become motivated by “citation engineering” rather than by “civil and environmental engineering”.

Long term:

- Take a leadership role in developing continuing engineering education for faculty in junior engineering institutions throughout Israel.

Comment: this is indeed a valid suggestion but difficult to implement in view of the existing faculty load and responsibilities as detailed above.

Infrastructure

Recommendations of the evaluation committee

Immediate:

- Conduct a thorough review of the technical condition and current relevance of all laboratories at the Faculty, both teaching and research, and generate prioritized recommendations to the Dean.

Comment: a partial evaluation of that kind has been done and served as a basis for setting projects for fund-raising for infrastructure. In view of the slow fund-raising process, the cost/effectiveness of such an effort for review of this kind is doubtful.

Intermediate:

- Produce plans, involving funding and implementation mechanisms, to upgrade specific laboratories (infrastructure and equipment) which are behind the state-of-the-art.

Comment: this has already been addressed, in particular with respect to the structural lab, the environmental fluid mechanics lab and the infrastructure transportation lab. Funding is difficult to raise and in some of the labs there were recent cuts in positions of technicians/engineers, implying that these cannot be operational, neither with new or old equipment. This is a frustrating situation, potentially undermining all the recent achievements of the Faculty and compromising its motivation. This situation and its consequences have been discussed with Technion management; so far with no comprehensive action plan undertaken.