



28.07.2016

Unit for Quality Evaluation and Assurance

The Council for Higher Education

Subject: The Advanced Materials Engineering Department,
Response to the Evaluation Committee Recommendations

Enclosed, please find the JCE Advanced Materials Engineering Department's Response to the Evaluation Committee Recommendations.

We feel that the evaluation process and the implementation of the report recommendations are helping create the conditions for continued improvement for the Advanced Materials Engineering Department, as well as for JCE as a whole.

Sincerely,

Abraham J. Domb

Prof. Avraham J. Domb

President

Azrieli - College of Engineering, Jerusalem (JCE)

CC:

Ms. Shlomtzion Lulu, Executive Vice President and CEO

Prof. Eitan Manor, Advisor to the President for Academic Affairs, Head of Advanced Materials Engineering Department

Prof. Tamar Raz Nahum, Dean for Academic Affairs

Dr. Radel Ben Av, Chair of the Academic Council, in charge of Quality Evaluation and Assurance at JCE

Advanced Materials Engineering Department, JCE: **Response to the Evaluation Committee Recommendations**

Short Term (0 to 1 years):

- 1. The faculty of the AME department should undergo a tutorial on how to better organize, promote, and implement a self-evaluation process that operates on a regular basis.**

The Department Council, which is comprised of all full-time department faculty members, will establish a self-evaluation process to operate on an ongoing, regular basis. The process will be based on the following foundation:

1. Faculty representatives will participate in Council for Higher Education (CHE) seminars to receive instruction/guidance in conducting self quality-evaluation.
2. JCE will hold yearly coordination meetings to instruct faculty on how to carry out self-evaluation.
3. The department faculty will divide among themselves the areas of responsibility relevant to self-evaluation.
4. The department will brief JCE management on a yearly basis on the findings of the self-evaluation process.

- 2. Proceed as smoothly as possible with construction of the new facilities, which are supposed to be completed within one year.**

The move into the new building - Building #3 (of the Master Plan) took place in October 2015. The building's construction area spans about 11,000 sq. meters, comprising a total of 6 floors, including 20 classrooms, seating 78 students each, as well as 2 auditoriums seating 135 students each. JCE classrooms are equipped with advanced lecturer podiums connected to a computer network and multimedia projectors, facilitating the use of multimedia presentations and a class management system. Some also have digital recording and broadcasting equipment installed, so that lectures and whole courses can be made available online for e-learning. The building includes a Student Center, housing Student Administration, the Office of the Dean of Students, Student Aid and nearby the Registrar's Office, and the Student Association Center. The building also houses a branch of the main Library, individual and group study areas, as well as rest areas for the students' use and a shelter space on every floor.

- 3. Revise the mission statement to reflect accurately areas of study at JCE.**

The mission statement has been revised:

"The mission of the College is to educate qualified, first-rate engineers, providing a reliable source of graduates for both the science- and technology-based industries and for graduate programs at leading academic institutions, in the following areas of study: Advanced Materials Engineering, Software Engineering, Industrial Engineering and Management, Electrical and Electronics Engineering, Pharmaceutical Engineering and Mechanical Engineering."

4. Establish a methodology to vet the mission statement with all relevant constituencies: faculty, students, alumni, and industry.

The methodology is based on meetings/discussions with all stake-holders: leaders from relevant industries, alumni, students and faculty, followed by brainstorming to formulate the mission statement for JCE as a whole and to rethink the relative weight and focus of the different fields of study for the AME Department in particular.

5. The Evaluation Committee recommends a slight broadening of the education during the third and fourth years by including a course on physical metallurgy. With the development of advanced functional materials, which rely on outstanding electrical and magnetic properties. It would also be appropriate in the long term to cover quantum mechanics to a larger extent than done in the current curriculum.

Per the committee's recommendation, a Physical Metallurgy course of three weekly teaching hours and one weekly exercise hour has been added to the curriculum for the academic year 2016-2017, and is currently under development. Following the committee's recommendation, relevant courses have been reformed to lay greater focus on quantum mechanics.

6. Increased participation of the faculty is needed in the placement process as one component of assisting students in finding professional jobs after graduation.

Following the committee's recommendation, JCE management has appointed a staff-member engineer to maintain open lines of communication with potential employers in the industry regarding all JCE students and graduates, and concerning the of relevant issues, in particular: Final Projects in the industry, hiring of students for student positions in the industry, receiving equipment as donation from industry, and promoting the hiring of our alumni by the industry.

7. The college must nurture the research activities of the JCE faculty by providing increased travel funds to attend and present research findings at research conferences in their appropriate areas of expertise. The ability to attend one meeting every year or two outside Israel is not unreasonable.

In accordance with the committee's recommendation, JCE management has increased the budget marked for funding JCE faculty research, to enable faculty members to present their research work and findings at academic conferences, in Israel and internationally.

8. There is an immediate need for an upgrading of the placement office for positions in high-tech companies.

JCE has an office of Alumni Affairs. When faculty are informed of engineering openings by industry contacts, they engage the Alumni Affairs staff to broadcast them to alumni. It is believed that the appointment of a staff-member engineer dedicated to keeping in touch with industry, following the committee's recommendation, will improve the rate of placement of graduates into professional engineering positions.

9. There is also an immediate need for more and better public relations for JCE within Jerusalem and the rest of Israel, which will also help to increase the applicant pool. It should also be possible to publicize what JCE is doing in the States and Western Europe.

The committee's recommendation has been forwarded to the JCE public relations office.

10. An increase of funds for attending conferences is recommended for the faculty members of the department and the reasons are outlined above.

In accordance with the committee's recommendation, JCE management has increased the budget marked for funding JCE faculty research, to enable faculty members to present their work and findings at academic conferences, in Israel and internationally.

11. Faculty members should identify common research projects with related departments of other colleges and universities within Israel.

There are several collaborative research efforts by AME department faculty members, jointly with faculty members from the Hebrew University of Jerusalem and from Tel Aviv University. Future collaborative research projects, with additional institutions are in the works. (See details under *Long Term Q5*.)

12. The faculty of the AME department should undergo a tutorial on how to better organize, promote, and implement a self-evaluation process that operates on a regular basis.

See response to recommendation no. 1.

Long Term:

- 1. Regularly revise mission statement as JCE matures as an institution and additional students enroll.**

The mission statement will be revised regularly, and factors such as opening of new programs will be considered.

- 2. Implement regular reviews of the mission statement following a well-defined methodology and involving faculty, students, alumni, and industry.**

As stated in *Short Term Q4*:

The methodology is based on meetings/discussions with all stake-holders: leaders from relevant industries, alumni, students and faculty, followed by brainstorming to formulate the mission statement for JCE as a whole and to rethink the relative weight and focus of the different fields of study for the AME Department in particular.

- 3. Upon success with the growth and expanding plans of the institute for the next two years, going further with expanding the JCE facilities, as suggested by the long term plans.**

As stated in *Short Term Q2*, beginning 2015 the Instruction building (building #3 of the Master Plan) has been completed, and all instruction is taking place there. Furthermore, in 2017 the conversion of the old building into a Laboratories building will start. Per the Master Plan, the construction of a 14-story (336-bed) dorms tower (building #1 of the Master Plan) is to begin in the near future. JCE management is currently exploring sources of funding for the construction of building #6 of the Master Plan, to house start-up high-tech ventures and a start-up incubator.

- 4. Selected growth of the AME faculty should occur to enable better curriculum coverage in the more classical areas of materials science and engineering.**

As soon as hiring new faculty becomes feasible, that is a position opens up or a new one is created by JCE, it is intended to seek and hire a faculty member whose field of expertise is in the classical areas of materials science and engineering.

- 5. The AME department should develop and implement a cost-effective program for enhanced faculty research participation, most likely one involving increased collaboration with faculty at the major research universities; e.g., the Hebrew University and Tel Aviv University. The program might include encouraging AME students toward enrolling at these institutions as graduate students to foster an identifiable JCE component of the research.**

In recent years, several collaborative research projects have been pursued by AME faculty:

Prof. Tamar Raz-Nahum, "Analysis for Gunshot Residue Particles," joint research with T. Tzach and E. Izraeli, from the Materials Lab, Forensics Department, Jerusalem, Israeli Police.

Prof. Tamar Raz-Nahum, "The Anomalous Fragmentation of Water Clusters at Ultrafast Impacts," joint research with Prof. Raphael David Levine of the Hebrew University of Jerusalem and Prof. Uzi Even of Tel Aviv University.

Dr. Ruth Sfez, "Chiral sol gel layers and hybrid nanomaterials," joint research with Prof. David Avnir of the Hebrew University of Jerusalem.

Dr. Ruth Sfez, "SAM for various applications," joint research with Prof. Shlomo Yitzchaik of the Hebrew University of Jerusalem.

Dr. Doron Azulay, "Electrical properties of planar defects in thin film Cu(In,Ga)Se₂"; "Electronic properties of CdSe nano-platelets"; "Percolation and composite materials," joint research with Prof. Oded Millo and Prof. Isaac Balberg of the Hebrew University of Jerusalem.

Dr. Rakefet Almog, "Functional printing for polymeric micro technologies," joint research with Prof. Yosi Shacham of Tel Aviv University.

The Department will continue to encourage faculty members to expand their research collaborations with university faculty.

- 6. Selected growth of the AME faculty should occur to enable broader research capability, possibly aimed at the more classical areas of materials science and engineering.**

As soon as budgetary considerations make hiring new faculty feasible, broadening AME's research capabilities, particularly in the classical areas of materials science and engineering, will also be a factor in the hiring choice. Meanwhile, the AME department will continue to encourage faculty members to expand their collaborative research projects into the classical areas of materials science and engineering. For instance, over the course of the year 2016 we have been holding meetings with faculty members from Bezalel Academy of Arts and Design to start collaborating on research projects in the area of ceramic materials.

- 7. The AME faculty should develop strategic plans for future equipment acquisitions and additional technical staff, including definition of needed areas of expertise. The plans should take into account potential changes in the curriculum, increased research activities of the faculty, and evolutionary changes in the field of materials science and engineering.**

JCE, in collaboration with Hadassah Academic College and The Jerusalem College of Technology - Lev Academic Center, have submitted a proposal requesting government funding for the acquisition of research equipment with the goal of establishing an Applied Research Center. The center would provide state-of-the-art research to Jerusalem's advanced industry, and it is believed that it will motivate more students to study engineering in Jerusalem. This facility is to be funded NIS 10-15 million by the Israeli government out of a budget dedicated to bolstering Jerusalem's development, with about half of this budget going to the JCE, which has agreed to lead the joint venture. At this stage we have already submitted detailed equipment lists to the Jerusalem Development Authority, which are intended for research, teaching and for providing services to industry. The equipment is suitable for multiple uses, so it will accommodate various high-tech and traditional industries, including: chemical engineering, pharmaceutical engineering, biological engineering, environmental engineering, materials engineering, and mechanical engineering.

- 8. The two points made above need to be vigorously and continuously worked on as they are crucial for supporting the needs of the students and concomitantly the needs of JCE.**

We agree and consider the advancement and expansion of research at the department, and JCE as a whole a priority. Accordingly, as can be seen from our responses to the above two questions, JCE is working to acquire the equipment needed to provide the means for faculty and students to engage in research.

- 9. Research projects with other colleges and universities (Hebrew University, Bar Ilan University, Tel Aviv University, Ben Gurion University, Ariel University) should be strengthened and fostered as they could help to meet the intentions of the department for increasing their own research activities.**

We will continue to make every effort to encourage faculty engagement in research, which we agree is a priority (at AME and JCE as a whole). As it is most often conducted in collaboration with university faculty – that collaboration is a crucial matter. Our ongoing effort in this regard can be seen in more detail in our responses to questions 5, 6 and 7 above.