August 3, 2016

The Materials Engineering response to the CHE committee report

The department appreciates all of the committee's hard work and careful evaluation of various aspects of the DME including senior and junior academic staff, technical staff, adjuncts teachers and alumni. We thank the respectful and esteemed committee members whom are internationally well recognized as leaders in the field of materials science and engineering. In general, the department agrees with most of the recommendations.

Short term:

1. Relieve overcrowded teaching laboratories.
   The most pressing problem in Ben Gurion University (BGU) is the lack of space. The amount of room/space allocated to the Materials Engineering Department is limited. The Department defined several directions to solve this problem. We managed to reduce the number of students in each group to three, which solved some of the overcrowding. We would like to see a further reduction in the lab's groups to two students in each group; however, this will require additional monitory resources from the faculty. At this time, the faculty cannot allocate more resources to this end. Another solution to the problem could be if the faculty could allocate more rooms for teaching labs, perhaps in a new building.

2. Increase the departmental administrative manpower to two full-time secretaries. The administrative staff of the DME should increase to a level that is determined by a department-based detailed analysis of present and future needs for the research and teaching agendas.

   We submitted two requests to the Faculty dean and the deputy rector to increase the administrative staff. Due to higher priorities in other departments of the faculty, the resources of the faculty are not allocated at this point to increase our administrative staff. We have a scheduled meeting with the deputy director-general of human resources, trying to allocate another budget for this issue

3. Change the chemistry teaching level by providing a separate, dedicated course in chemistry that meets specifically the needs of materials engineers. The Rector and the Dean have to be involved in this change, because they have to involve the chemistry department to solve this serious problem.

   We agree with this recommendation. The department will be happy to participate in changing the course syllabus to be more specific to our needs. We will set a meeting with the faculty in parallel with revision of the current syllabus to our updated teaching program. In the current syllabus, some subjects

are less relevant to materials, engineering but due to the fact that the current course is given to several engineering departments, a faculty decision is required. For improving our students background in chemistry, we would like to strengthen the electrochemistry and corrosion aspects in the course. We will ask the faculty to add an additional exercise group; also, we would ask that the current course will be divided into two individual courses, one given to us with more specific subjects and a second to other departments.

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

   As described in our report we held an offsite evaluation day in which all the relevant populations participated: all the faculty members, several emeriti and adjunct faculty members, representatives of the technical and administrative staff, former graduates who are in senior positions in a variety of industries, selected graduate students and senior undergraduate students. The Dean of the Faculty of Engineering also took part. The DME vision was discussed in this evaluation day.

   Last year we also initiated a dedicated activity called "Unit Cell", which is composed of a group of students aimed to enhance the relationship between active students, alumni and industry officials. The department supports this group and Prof. Roni Shneck is the liaison on behalf of the DME to its activities. Most of the DME academic staff members are in close and continuous relationships with industrial representatives (some are also alumni of the DME) therefore an exchange of ideas exists and the industry needs are being brought to our attention continuously. Furthermore, following the suggestion of the committee, the DME will consider assembling a steering forum, which will include representatives from all academic staffs, students, alumni and industry to periodically meet and discuss and formulate the DME mission statement.

5. Study Program- the department should choose or create courses in the graduate program as being mandatory by avoiding specialized and less demanding graduate level courses. This includes a course on chemistry of materials, ideally taught by faculty from Department of Chemistry.

   This recommendation was already implemented this academic year (2015-2016). The DME established four mandatory courses, from which the students need to choose two courses. One of them is closely related to chemistry of materials: "Thermodynamics of Multicomponent Solutions"

6. Additional rooms should be allocated to the Department of Materials Engineering by BGU or the faculty of engineering with the highest priority concerning rooms for laboratory courses. In this context the outdated equipment of the laboratory courses need to be upgraded.

In the past 5 years, the DME invested about 1.5 million NIS in order to upgrade the teaching labs' equipment, most of the funding was obtained from the Engineering Science Faculty but some was obtained from the Rector's office. Regarding rooms as mentioned before there is a space problem university wide. One possible source of rooms within the department is taking labs from retired senior academic staff members and the DME's policy is to take room from such members who are not active in research.

7. The DME should add to the current number of 12 full-time faculty members, both by immediately replacing the faculty member who is retiring and adding at least one new faculty member in an area of growth in the broad field of materials science and engineering.

   The DME is in the process of recruiting another senior staff member according to the DME's vision as detailed in our report. We published a vacant position announcement and we continuously consider relevant candidates. We have offered twice a position to a suitable candidate however, they decided to join another institution. We will of course, continue our efforts. Regarding a new additional member after filling the vacant position we currently have, since the pool of suitable engineers that also did a post doc fellowship is not a big one, the DME council decided to actively seek and encourage internal candidates, whom are excellent students that graduate our department. We have successfully recruited such a candidate a few years ago.

8. The quality of the service courses offered by the physics and mathematics departments to the students of the DME need to be rapidly improved

   The DME is continuously working with the Physics and Mathematics Departments in order to improve the service courses and the level of student's knowledge. We participate in developing the courses syllabi and we have a designated faculty member that serves as liaison to these departments.

9. The materials engineering students need the first course in chemistry to be more focused toward materials concepts and to be taught to them independent of the mechanical engineering students. There are a sufficient number of materials engineering students to justify doing this, which was stated to be 80 per year.

   We agree that this is an important issue however, it needs to be solved on the faculty level. Nevertheless, we try to improve the level of this course by adding exercise hours and adapting the current syllabus. In addition, we plan after recruitment of a new faculty member, to open a new course: chemistry for materials engineering which will be given by our new faculty member.

10. There is a pressing need to decrease the fraction of 50% of the graduate courses in materials engineering that are not demanding.

The department's graduate teaching committee decided to establish four mandatory courses for master's degree. This was already implemented on this year program of 2015-2016.

11. The equipment for the undergraduate laboratories needs to be upgraded. Additionally, the space for undergraduate laboratories needs to be increased to solve the serious safety issue problems.

    The Department defined several directions to solve safety problem, as mentioned in our response to section 1 . We reduced the number of students in each lab group to three, which solved some of the overcrowding Safety issues are being continuously addressed. The DME has a safety committee and the university's safety inspector regularly checks the safety conditions in every lab in the DME and prepare a report .The DME has immediately acted to solve the concerns mentioned in the report.

12. Strong efforts need to be made in the area of marketing their department within the faculty of engineering and to also do this for different constituencies outside of BGU.

    The DME has a marketing committee that is responsible for contacting suitable candidates such as high school graduates, university alumni. The committee is responsible also for preparing marketing information for distribution within the faculty and outside BGU.

13. The DME needs to address the fact that their students need to work by providing, for example, a tuition waiver, increasing the stipends of excellent students, etc.

    Graduate students receive tuition waiver, and stipends that depend on their academic achievements. In the past 2.5 years, the DME managed to get a small addition for the graduate student's stipends from the faculty and rector as we managed to increase the number of graduate students. The graduate students in the DME usually get additional stipends from their advisor's research grants.

14. There is a pressing need for more space for M.Sc. students.

    We agree that this is a critical issue but it can be solved only with the help of the faculty. We submitted our requests for additional rooms to the faculty.

15. The undergraduate courses need to be upgraded

    The undergraduate courses are being continuously upgraded. The teaching committee revises the syllabi of the undergraduate courses every year and if

needed modifications are made to the content. In the academic year following the evaluation committee's visit and according to its suggestions several new elective and mandatory courses were introduced to the teaching program. For example courses is Nano structured materials, bio materials, surface engineering, failure of engineering materials: mechanisms and analysis methods, equipment, principles and the use of thermal analysis methods in materials science and engineering

16. The department should define learning outcomes for all remaining undergraduate courses that do not yet have them. All course learning objectives should then be mapped onto appropriate program learning objectives as a means of evaluating the program outcomes and effecting continuous quality improvement of the program.

    As a part of the self-evaluation process the DME decided that, all the DME courses' syllabi should be upgraded to Bologna format, which include learning objectives and outcomes. The syllabi are presented in our self-evaluation report. Every semester the syllabi of new courses are prepared and approved by the DME teaching committee according the Bologna format.

17. The Faculty of Engineering should not use the impact factor as a sole criterion as its average value is lower for journals of materials engineering in comparison with journals of the physical, chemical and life sciences.

    The Faculty of Engineering never used the impact factor as a sole criterion in any of the decisions for the DME or any other faculty departments. There is a university request to add the Q value for publication listed in the CV, which accounts for the lower Impact factor of the field, as well as H index.
    The evaluation process is thorough, based on the recommendation of the Departmental appointment committee, the head of the department recommendation letter supported by two evaluation letters from experts in the field. The Faculty promotion committee considers factors such as the quality of the published papers, their number per year since previous promotion, international collaboration and impact, funding from competitive and uncompetitive funding sources, teaching grades, ability for independent research and more.
    Positive recommendation of the Faculty promotion committee would follow by committee of experts in the field, which would suggest to the Dean names of scientist to ask for evaluation letter. The final assessment and recommendation of the committee would be based on the candidates' record, at least six evaluation letter of experts in the field that received candidate’s manuscripts and CV.

18. The department should establish a self-evaluation process that incorporates internal review of its activities on a regular time scale that is shorter, possibly

even annually for some activities, than the seven-year Council on Higher Education reviews.

We agree and we plan to conduct a self -evaluation process every 2- 3 years.

Long term:

1. Expand the space of the teaching laboratories by at least 30%.
   Expand as well space for research activities.

   This problem may be solved with the help of the faculty.

2. Replace the department's old electron microscopes by new ones and include in this venture a purchase of a top high resolution electron microscope (HREM) for Dr. Louisa Meshi. Having a unique research lab in electron microscopy and structural analyses will elevate the level of the entire department and add to its prestige in terms of high-level research.

   This issue is currently under consideration of the university's president.

3. Strengthen further the close relationship with NRCN to enable an effective exchange of people, to the mutual benefit of both parties.

   Relationship between NRCN and the DME is very good and continuously being improved. For example, each year 5-6 engineering projects are supervised by researchers from NRCN, five senior researchers teach courses in the department as external/adjunct teachers. In addition, several senior faculty members have ongoing joint research projects with NRCN.

4. Regularly revise the mission statement as the Materials Engineering Dept. at BGU grows as a teaching and research program and additional students enroll.

   We plan to revise our mission statement every 2-3 years within the planned process of self -evaluation.

5. The DME should probably grow by at least a few additional faculty members to represent adequately itself in the ever-evolving field of materials science and engineering and still cover its growing commitment to quality research and education on the BGU campus.

   We agree completely with this recommendation and will be very happy to obtain a few additional academic positions. The university management systematically considers such growth based on research merits and teaching needs.

6. The DME should take the initiative to develop a more viable and visible total materials research community on the BGU campus.

We plan to continue and improve our collaboration with the departments of chemical and mechanical engineering and the chemistry department at BGU in order to increase the number of joint scientific projects and encourage more faculty members from these departments to supervise undergraduate engineering projects.

7. The department should analyze critically and present in a very specific manner its current and future needs for technical staff members to perform effectively its research and teaching agenda.

   We agree and we intend to continue revising our technical staff needs.

8. The quality of the service courses offered by other departments to the students of the DME needs to be improved: specifically, chemistry, mathematics and physics.

   The solution for these issues was already discussed on section 9 in the short term recommendations.

9. *The materials engineering students need the first course in chemistry taught to them independent of the mechanical engineering students. There are a sufficient number of materials engineering students to justify doing this, 80 plus each year.
10. *The equipment for the undergraduate laboratories needs to be upgraded.
11. *The space for undergraduate laboratories needs to be increased to solve the serious safety issue problems.
12. *The DME needs to make a strong effort in the area of marketing their department with the faculty of engineering.
13. *The DME needs to address the fact that their students need to work by providing, for example, a tuition waiver, increasing the stipends of excellent students, etc.
14. *There is a pressing need to decrease the fraction of 50% of the graduate courses in materials engineering that are not demanding.
15. *There is a pressing need for more space for M.Sc. students.
16. *A process of self-review of teaching and learning outcomes must be developed, which evaluates achievements of outcomes on a periodic basis that involves time scales shorter than seven-year CHE reviews.

    * Recommendations 9-16 are identical to those presented in the short term Recommendations therefore were already addressed.

17. For the sake of a broad education of students and the needs of Israel's industries the Department of Materials Engineering should maintain its unique feature of providing a broad education in both advanced and classic materials and in structural and functional materials.

We welcome this recommendation since it strengthens our vision of the DME future including our recruitment plans, as well as our plan to enhance the engineering orientation of our teaching program. We will continue to involve

senior Israeli industry officials in teaching in order to provide a broader engineering education to our students.

18. The DME needs to demonstrate that all the above stated problems have been completely solved.

    We will review the solutions of the mentioned problems after 2-3 years within the process of self -evaluation we intend to conduct.

19. The DME should be supported to sustain its current and potentially very high level of research.

    We welcome this recommendation and hope we will indeed get the suggested support.

Signed by:

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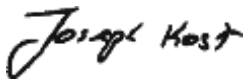
Prof. Nahum Frage
Materials Engineering- Dept. Head



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Prof. Joseph Kost, Dean

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Prof Gad Rabinowitz,
Deputy Rector