



**Committee for the Evaluation of Electrical and Communication System
Engineering
Study Programs**

**The HIT – Holon Institute of Technology
Programs in Electrical and Electronics Engineering
Evaluation Report**

November 2016

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Chapter 1: Background

The Council for Higher Education (CHE) decided to evaluate study programs in the field of Electrical and Communication System Engineering during the academic year of 2016.

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

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

- ***Prof. Alan Oppenheim***- Department of Electrical Engineering and Computer Science – MIT, USA. Committee Chair.
- ***Prof. Susan Conry*** –Wallace H. Coulter School of Engineering Electrical & Computer Engineering - Clarkson University, USA.
- ***Prof. Roch Guerin***- Department Chair and Professor of Computer Science & Engineering Department- Washington University in St. Louis, USA.
- ***Prof. Ehud Heyman***- School of Electrical Engineering - Department of Physical Electronics- Tel Aviv University, Israel.
- ***Prof. Eby G. Friedman***-Electrical and Computer Engineering, Department of Electrical and Computer Engineering- University of Rochester, USA.
- ***Prof. Mathukumalli Vidyasagar*** - Chair in Systems Biology Science Erik Jonsson School of Engineering & Computer Science - The University of Texas at Dallas, USA.
- ***Dr. Orly Yadid-Pecht*** - iCORE/ATIF Strategic Chair in Integrated Sensors/Intelligent Systems, Professor and Lab Director - University of Calgary, Canada.
- ***Prof. Dr.-Ing. Walter Kellermann***- Chair of Multimedia Communications and Signal Processing- University Erlangen-Nuremberg, Germany.

Ms. Daniella Sandler and Ms. Inbal Haskell-Gordon served as the Coordinators of the Committee on behalf of the CHE.

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

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

The entire process was conducted in accordance with the CHE's Guidelines for Self-Evaluation (of September 2013)

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

Chapter 2: Committee Procedures

The Committee held its first meeting on January 6, 2016, during which it discussed fundamental issues concerning higher education in Israel, the quality assessment activity, as well as Electrical and Communication System Engineering Study programs in Israel.

In January 2016, the Committee held its visits of evaluation to 12 programs: Tel-Aviv University, the Technion, Bar-Ilan University, Ben-Gurion University, Shamoon College of Engineering, Ruppin Academic Center, Azrieli - College of Engineering Jerusalem, Lev Academic center, Ort Barude College, Holon Institute of Technology, Ariel University and Afeka College of Engineering. During the visits, the Committee met with various stakeholders at the institutions, including management, faculty, staff, and students.

This report deals with the programs of Electrical and Electronics Engineering Administration at the Tel Aviv University. The Committee's visit to the University took place on January 14, 2016.

The schedule of the visit is attached as **Appendix 2**.

The Committee thanks the management of the HIT – Holon Institute of Technology and the Department Electrical and Electronics Engineering for their self-evaluation report and for their hospitality towards the committee during its visit at the institution.

Chapter 3: Evaluation of Electrical and Electronics Engineering Study Program at the Holon Institute of Technology

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.

1. Executive Summary

The Holon Institute of Technology is an institution that views itself as occupying a unique position in Israeli higher education, preparing young men and women for careers in high-tech fields through a high quality education. Needs of the students are met through a variety of mechanisms so that each student has an opportunity to accomplish his or her goals. At the same time, the institution regards research as being critical for fulfilling its role in Israeli higher education. It is very important to sustain an environment that is supportive of the kinds of research that are consistent with the institutional mission.

As part of the current review, the evaluation committee observed that the institution has been responsive, with varying degrees of effectiveness, to all of the issues that were raised in the 2007 report. The most important recommendations of the 2016 evaluation committee are associated with the observation that the Institute's mission as an academic institution with excellent applied research contributions and a strong teaching mandate must drive both the teaching and the research activities. Guidelines for evaluation of faculty contributions, evaluation of the research that is conducted, determination of faculty workload, and providing resources for faculty activities should be supportive of the faculty and the students in this context.

2. Mission and Goals

Observations and findings

The Holon Institute of Technology (HIT) was established in 1969 and has undergone several transitions since then, as outlined in the self-evaluation report. Since 1999 it is a nonprofit society, recognized, since 2002, as an institution of higher education. Its name, since 2006, is Holon Institute of Technology (HIT).

The mission of HIT is to *“shape the future of the technological leadership in the State of Israel by endorsing the values of sustainability and social responsibility and by:*

- *Creating a synergy of engineering, science, art and culture.*
- *Being attentive to the needs, wishes, and aspirations of the institute’s staff, students, society, and community.*
- *Being a long-term “home” for the students by building long-lasting relationships and offering continuous guidance to its graduates.*
- *Maximizing the full potential of all the Institute’s partners and providing the students with the right tools for building their futures.”*

Its goals have also been stated in its Strategic Plan 2015: *“The goal of the Institute is to prepare its engineers, computer scientists, applied mathematicians, designers, technology managers and instructional technologies exerts to enter the business world and Israeli society as leaders and partners.”* The core values of HIT are centered on excellence, up-to-date academia, a multi-disciplinary approach, innovativeness without compromises, community, quality of service, and continuous improvement.

The evaluation committee notes that there is a clear sense of collaboration among all segments of the academic community. There is evidence that students and faculty alike strive for excellence in their endeavors. The vision of the administration is recognized by the faculty as being a good one, but the

institution is undergoing change. The faculty sees that the institution is on a path to achieve a higher level of excellence but has not yet attained the level that is envisioned. Inherent in the mission and core values of HIT are the elements of its vision, which is to be a leading, creative and groundbreaking technological institute that aspires to excellence in all aspects of its endeavors.

As the evaluation committee read the self-evaluation report and listened to the administration, faculty, students, and alumni of HIT, it became evident that the stated mission and goals of HIT are ones that emphasize its focus on providing a high quality education to young men and women that prepares them for careers in hi-tech industry. A substantial fraction of the student population is challenged because they must work to support themselves, or because their academic background needs to be enhanced. The school addresses these challenges by providing a “flexible schedule” to working students, as well as preparatory programs for students with weaker backgrounds. The evaluation committee observed that the flexible track is one of the strengths of the program since most students in this track are working in industry and gain technical experience and professional maturity through their work experience. The committee commends the strong commitment on the part of the administration and the faculty in carrying out the institutional mission.

It is also evident that both the administration and the faculty are aware that faculty must be engaged in applied research activities in order to deliver high quality instruction to the students. The committee clearly supports this mission.

Yet, at the same time, the expectation is that for promotion, in particular to the higher ranks of Associate Professor and Professor, faculty members must engage in research that results in peer-reviewed publications and funded research programs. The evaluation committee observed that this expectation

may create tension with the stated mission of the institution. It is difficult to conduct large-scale cutting edge research while carrying the teaching load which is required from the faculty. It is even more difficult when there are no post graduate research students. Consequently, there is a strong desire by both the administration and the faculty to open a master with thesis program.

It appears that HIT aspires to be recognized as an academic institution in which research is done at the level expected in a university, though its mission statement does not emphasize the research component, but rather the high quality education that prepares students for careers in high-tech industry.

The committee recommends that the Institute focus on its stated mission as an academic institution with a strong teaching mission and applied research activities. Appropriate models should be developed to encourage and compensate the faculty for their research activities and recognize the contributions their research makes to teaching. An example of such a model could be one that reduces a faculty member's teaching load when he or she is advising M.Sc. research and reduces it further if the research leads to a paper published in a high quality journal. While criteria for promotion, in particular to the higher ranks of Associate Professor and Professor, should include a component of research. Research that is focused on publishable applications and industrial developments must be recognized and valued.

Recommendations

Advisable:

- The committee recommends that the Institute focus on its stated mission as an academic institution with a strong teaching mission and applied research activities.
- The committee recommends that the administration establish a process by which faculty members who engage in research, advise M.Sc. research,

and publish their work in high quality journals are recognized and rewarded for this.

- The committee recommends that the CHE establish a set of criteria for evaluation of applied research in institutes whose mission is primarily teaching.

3. Organizational Structure

Observations and findings

The Holon Institute of Technology has five faculties, of which the Faculty of Engineering is one. The institution is led by a President who is elected by the Board of Trustees on recommendation of its Governing Council. The Supreme Academic Council of HIT is the chief governing body of the Institute. It is chaired by the President and has representation from the administration and all ranks of the faculty as well as the students. There are a number of active academic committees of the Institute, and these are responsible appointments (except for promotion to the highest academic ranks), curriculum, teaching, admissions, research, and other aspects of academic administration at the institutional level. Administrative committees deal with matters related to procurement, safety, logistics, and other such areas of administrative purview.

The Faculty of Engineering is led by the Dean, who has a cabinet consisting of himself and the department chairs. This group of individuals works to develop high level strategic plans for the Faculty of Engineering. In addition, there is a Teaching Committee, a Graduate Committee, an Academic Recruiting Committee, an Industry Relations Committee, a Library Committee, and a Discipline Committee.

At the time of the 2007 CHE review, the evaluation committee observed that the separation between the Electrical and Electronics Engineering Department and the Communications Engineering Department was too large.

Since that time, the Faculty of Engineering has been reorganized as a single unit with specialization tracks. At first there were three tracks: Communications Engineering, Electrical Engineering, and Power Systems and Renewable Energy. Subsequently, the Electrical Engineering track has been further subdivided into five tracks: Microelectronics and Nanotechnologies, Electro Optics and Image Processing, Computer Embedded Systems, Control and Robotics, Bio Engineering Overall there are now seven tracks within the B.Sc. program in Electrical and Electronics Engineering program and four tracks within the M.Sc. program as outlined in Table 3-1 of the self-evaluation report. The committee observes that the track-heads are highly motivated to develop their tracks both academically and in terms of manpower, and are encouraged by the administration to do so. Because this organizational structure was put in place about one year ago, it remains to be seen how effective it will be in managing the delivery and development of the programs. It is possible that support for so many tracks within the program may be difficult to manage. The track structure is not simple.

4. Study Programs

Observations and findings

The program of study leading to the B.Sc. in Electrical and Electronics Engineering is a four-year program of study that is comprised of required and elective courses along with general education courses that total 161.5 credits. All tracks of the B.Sc. curriculum are common for the first two years. Beginning in the fifth semester, students choose courses that are required and elective within the track they chose to pursue. There is also a two-year M. Sc. program offered that is a non-thesis second degree with four tracks. In 2014, HIT submitted a request for a thesis track in the M. Sc. program. The evaluation committee found that there is support from the administration, the faculty, the students, and the alumni for the opening of an M. Sc. program with thesis.

There are tracks leading to the B.Sc. in renewable energy and power systems, communication engineering, microelectronics and nano-technologies, electro-optics and image processing, bio-engineering, control and robotics, and embedded computer systems. At the M.Sc. level, there are tracks only in the first four areas, i.e., in energy and power systems, communications engineering, microelectronics and nano-technologies, and electro-optics and image processing.

At the time of the 2007 CHE evaluation, it was observed that not all tracks were offered every year, and that this prevented students from planning their studies and making optimal choices regarding their specialization tracks. Since that time, the track structure has been reorganized and all tracks are offered on an annual basis. The track reorganization has resulted in the creation of new focus areas in renewable energy and embedded computer systems and has involved significant updating and development of in several other tracks as well.

It is clear that the syllabus has been developed in the spirit of a university model. Students engage in learning and are able to select their courses so that they can fulfill their own personal goals. The evaluation committee heard from students who had planned their choice of courses so that they could gain the knowledge needed to pursue a particular project of intense personal interest to them. They were able to select courses so that their program of study was indeed driven by the problem.

It appears that the new track structure has opened possible focus areas that are appropriate for the students' needs. Unfortunately, some of the tracks may have been opened prematurely and it appears that there is some confusion on the part of students when they select their track electives. The evaluation committee learned that students were told a number of courses would be available to support one new track and not all of those courses were offered when the track opened. It is likely that this occurred as the

result of “growing pains” associated with establishing a new track, but better planning and communication with the students could have avoided the situation.

Recommendations

Advisable:

- It is important to avoid creating too many tracks within the B.Sc. program. A proliferation of tracks could make it difficult for students to identify an area of focus that is relevant to them. It could also make the task of managing curriculum development less cohesive.
- When opening a new track, it is very important that adequate planning for the structure and content of the track be done. It should be made clear to the students which courses will be available and the appropriate resources should be in place before the track is opened.

Desirable:

- In order to increase the variety of courses in the M.Sc. program, and to make it more cost effective, it is suggested that elective courses could be given in a two-year cycle, so that students can plan ahead for the entire two years of their studies.

5. Human Resources / Faculty

Observations and findings

In 2015, there were on the order of 40 faculty members supporting the B.Sc. and M.Sc. programs in Electrical and Electronics Engineering. Twenty-two of these were senior faculty members all of whom had the Ph.D. degree and eleven were junior faculty members, eight of whom hold the Ph.D. degree and three of whom hold the M.Sc. degree. Eleven individuals, most of whom hold the Ph.D., are adjunct faculty members whose teaching contributions to the programs ranges from 2 to 20 hours per week.

In the last few years, the Faculty of Engineering has hired a number of new faculty members. The evaluation committee was impressed with the new faculty who have joined the Faculty. They appear to be well qualified, enthusiastic, and dedicated to their scholarly activities. The messages that they have been receiving from the administration are focused on the importance of doing high quality research and the importance of providing a high quality education to the students.

Faculty at HIT perceive that the metrics that are significant in evaluation of their contributions are numbers of publications in high impact journals and the scores they receive on the surveys completed by the students at the end of each course. The faculty members, particularly the new faculty members, expressed the desire to produce research that is on the same level as the research that is done at the leading universities in Israel. They also indicated that their teaching should be at the level of these universities, so that their students should be able to perform at the same level as the university students on examinations in the same subjects. The evaluation team is concerned that the emphasis on producing research at this level while working in an environment that has a primary mission involving education of engineers for industry leads to confusion about the mission of the institution. It is not realistic to expect that the faculty at HIT should be able to perform to these standards and also to expect the typical student at HIT to perform at the same level as university students. It appears that the criteria for promotion at HIT are very similar to those for promotion at the universities, yet the funding model makes it impossible for the institution to provide them with an environment that is similar to the one they would find at a university.

The faculty at HIT are to be commended for many achievements. They are successful in their primary mission, which is to educate young people so that they are prepared to enter the workforce. They are actively engaged in applied research that is in support of industry needs. A spirit of active

collaboration is evident among faculty and students, and this contributes to a vibrant learning environment. Some of the faculty are active in guiding students to a thesis-based M.Sc. at nearby universities, though there is no funding model that provides them with an incentive to do so.

The adjunct faculty members provide a valuable service to the program. The scope of their contributions is widely variable. There is currently no space where the adjunct faculty members can meet with students on a regular basis. They have no on-campus “home”, and it seems that in some cases they are only on campus to teach their courses. In addition, it appears that they receive little feedback on their contributions and some may not be as active with industrial interactions as might be desired. It appears that some are teaching more or less the same course at several institutions. These factors make it difficult for the adjunct faculty members to participate in the life of the institution. It is possible that the program would benefit from the hiring of some new faculty who are flexible enough to teach some of the courses now taught by the adjuncts and still participate actively in the life of the institution.

Overall, the development of the faculty appears to be appropriate, though they would benefit from a more well defined mentoring process.

Recommendations

Advisable:

- The mission of the institution must drive both the teaching and research activities at HIT. High level teaching standards must be maintained even as the faculty are encouraged to engage in applied research activities.
- Evaluation of the faculty should be guided by the mission of the institution. Because the mission is focused on preparing its graduates for careers in high-tech industry, it is important for the faculty to understand that they will be evaluated on their contributions to this mission.

Because they must remain current in their discipline, it is also important that a component of their evaluation be related to this as well.

- Faculty at all levels, but especially those who are new to the institution, would benefit for a more formal mentoring program.

Desirable:

- It is suggested that the Institute develop a model for encouraging research activities that is consistent with the mission of the Institute and supportive of the faculty members' need to engage in research in order to attain promotion and maintain technical currency in the discipline.

6. Students

Observations and findings

The typical student at HIT is one who has completed his or her army service and is seeking an education that will enable his or her entry into a position in industry in the field of electrical or electronic engineering. On the order of 10% of the B.Sc. students intend to pursue a second degree, either at HIT or in a university. There was consensus among the students that opening a M.Sc. program with thesis at HIT would be beneficial.

At the time of the 2007 CHE evaluation, the observation was made that the admission threshold was below what the evaluation committee thought appropriate and that the termination conditions were too lenient. HIT aspires to attract high quality students and believes that an analysis that goes beyond the psychometric and matriculation score calculation. The institution has in place preparatory programs in mathematics and physics to enhance the preparation of students who appear to have weaker backgrounds in these areas. Every effort is made to provide assistance to students who may be having academic difficulty. If students fail four or more courses, they are dismissed from the program. The dropout rate is highest in the first two years of study, but the dropout rate is relatively low – on the order of 7 to 8

percent in each of the first two years, with an accumulative 4-years rate of 22 percent to 25 percent (see Tables 4-3 and 4-6 of the self-evaluation report). These numbers are reasonable.

Students come to HIT to learn and appear to be motivated more by the desire to learn than by the simple desire to obtain a degree. They are very appreciative of the opportunities that are given to them by the institution and its faculty and they especially value the flexibility in class scheduling and the evening program that make it possible for many of them to work and raise a family while pursuing their degrees. They also perceive that the city of Holon and its neighboring cities are good places to live, learn, and raise a family and mentioned that the institution is supportive of those who wish to combine service in the IDF with studies at HIT.

The students in the meeting with the evaluation committee were engaged, very appreciative of the learning environment and the interactions they have with the faculty, and vocal. They expressed their opinions about the program honestly. There were some students in the group whose learning style made it difficult for them to learn in traditional lecture mode. Others expressed a desire to have more on-line materials made available to them so they could explore concepts more fully outside of class time. The students would be well served if the faculty would identify appropriate materials available on line that reinforce the lecture material.

Recommendations

Advisable:

- Due to the mode of studies students employ in the flexible track, faculty members should be encouraged to include in the syllabus and in their lectures information concerning sources of supporting material that is available on-line. This should be encouraged by the administration and presented to the students in a structured manner in all courses.

7. Teaching and Learning Outcomes

Observations and findings

The students are generally very appreciative of the educational experiences they have at HIT. They observe that the sense of collaboration and the attention they receive from the faculty are factors that help them to succeed. A number of the students indicated that they are involved in research projects with faculty members.

The final projects of the students seemed to be of high quality and appeared to meet the objective of providing the students with an experience that would prepare them well for industry. It was encouraging to see that students could define their own project problems if they wished and pursue them with the support of the faculty. Indeed, it was impressive that some students not only chose their project, but focused their choice of courses to take so that these courses covered the things they needed to know to make the project a success. This sort of problem based learning can be very motivating and should be considered as a potential model the program could support.

There were a few areas in which students expressed a desire for an improved experience. One of those areas is associated with the opening of the Embedded Computer Systems track. It seems that the track is very new, and some of the students were in the first cohort that went through the track. The committee observes that the track may have been opened prematurely. While several courses were promised to the students as the track was opened, fewer were actually available when the students attempted to enroll. In addition, it appears that the resources available to properly deliver the program may not have been in place when the track was opened.

Another area of concern to the students is the state of the laboratories. It appears that the equipment that is made available to the students in some

laboratories is old, outdated, and, in some cases, not functional. In some cases, they expressed the opinion that this had a negative impact on their opportunity to learn. Although not articulated as an area of concern, the students did express a desire to have the syllabus for each course contain (along with the topical content of the course) a set of references to relevant available on-line material.

Recommendations

Advisable:

- Before opening any new track, it is very important that the processes to be followed in bringing the new track into being be well thought out. It should be made clearly known to students which courses will be offered and when. It should also be determined that the resources available to support the track are in place before the track is opened.
- The laboratory facilities of the program should be carefully reviewed. All equipment that is to be used by the students should be in good repair and should have functionality that will give students the kinds of experience that will prepare them to work effectively in industry.
- Course syllabi should contain references to relevant material that is available on line wherever possible and appropriate.

8. Research

Observations and findings

Holon Institute of Technology regards research as being very important for fulfilling its role in higher education in Israel through the preparation of its students for successful careers in industry by providing them with up-to-date technical knowledge. At HIT the professional advancement of faculty members depends on their individual participation in research activities, and evidence of this participation is found in publication in peer reviewed

international venues, presentations at seminars and conferences, and participation in projects that are funded by national or international grants.

A strong spirit of collaboration is evident among the faculty. They are publishing in recognized journals and presenting papers at international conferences. They are also working in collaboration with colleagues at universities in Israel and elsewhere, and (in some cases) guiding the M.Sc. research of students at such institutions as Tel Aviv University. Some faculty members have been successful in attracting funding from governmental sources.

The funding that HIT receives from the Council for Higher Education is based on the formula that supports teaching activities with parameters that are applicable to the academic colleges in Israel. There is no budgeted support for research included in its allocation under this formula. The allocated budget is determined using the number of students in the discipline, a fixed tariff for the discipline and degree level, the graduation rate coefficient, and the student to academic faculty ratio at the institutional level.

In addition, full professors are required to teach 16 hours per year, associate professors 20, senior lecturers and lecturers 24, and junior faculty 32. Thus faculty members have at least 8 contact hours per week each semester on an average (though the load may be split so that a given faculty member teaches more hours in one semester and less in the other). At HIT, the Faculty has been successful in attracting well qualified new faculty by offering them a reduction in teaching load for a period of time. There are also processes in place whereby faculty may request a reduced teaching load based on evidence of significant research activity. Decisions as to whether or not such a request is granted are made on a case by case basis, and while the parameters that are used in making that decision are generally understood, there is some lack of transparency in the decision-making process.

The faculty are clearly being expected to engage in research at a level that is similar to that which is expected in a university. They aspire to produce research that is at university level. The evaluation committee observes that the aspirations and expectations of the faculty and the administration relative to the nature and level of the research that is conducted by the faculty do not appear to be well aligned with the institution's mission and the nature of the teaching role that the faculty must play to fulfill that mission. The emphasis on applied research that is well aligned with the needs of the military and industry is part of HIT's vision statement. The mission is more directly associated with applied research than the basic research that is often pursued in a university setting.

A number of steps could be taken that would foster the institution's mission and better support the faculty's research goals. The faculty observed that if there were a M.Sc. program with thesis, the faculty would have access to graduate students who would be of help to them in the conduct of their research. They also noted that it would provide a group of students who could serve as teaching assistants and effectively reduce the teaching load of the faculty. If there were a funding model which would provide support for faculty members who are directing the graduate studies of students in one of the universities, that funding could be used to enhance the faculty member's research. Finally, it seems evident to the evaluation committee that the metrics used in evaluation of faculty performance are heavily weighted in favor of research, and the metrics used are those which are also used at the universities. If there were a faculty evaluation model in place that gave equal weight to the teaching component of the faculty member's contributions, the faculty could be motivated to direct their efforts in a more balanced manner.

Recommendations

Advisable:

- In 2014, HIT requested a thesis track in the M.Sc. program. The development of a M.Sc. degree with thesis could provide support for research activities by enabling the faculty to attract students who would provide real help in their research and teaching support through their contributions as teaching assistants. It is very important to sustain an environment that is supportive of the kinds of research that are consistent with the institutional mission.
- Consideration should be given to the development of a funding model that would reward faculty who are advising M.Sc. and Ph.D. students at a university. Such a funding model could also include grants to M.Sc. and Ph.D. students for teaching assistantship at the colleges.
- The processes whereby faculty are evaluated and the criteria for professional advancement should be more evenly balanced in their consideration of teaching and research.

9. Infrastructure

Observations and findings

The laboratory infrastructure at HIT consists of some laboratories that are intended for instructional use only and others that support both teaching and research. Some of the laboratories the evaluation team visited were well equipped and clearly supported the teaching and research associated with the laboratory. Others, while supporting the intended purposes at some level, appeared to be in need of renovation. The students indicated that some of the laboratories they were using had equipment that was in need of modernization and also not in good repair. Students indicated that some equipment was not functional, and this caused some difficulty because it made it hard for students to accomplish the tasks they were asked to complete.

Recommendations

Advisable:

- A complete review of the laboratory infrastructure by an independent evaluator should be done to assess the adequacy of the laboratories for the support of the teaching and research activities of the faculty and students.

10. Self-Evaluation Process and implementation of previous recommendations

Observations and findings

The self-evaluation process began in November of 2013. The evaluation process was led by Dr. Nava Shaked, a faculty member who was responsible for guiding the evaluation process. There was participation on the part of the Dean of the Faculty of the Faculty of Engineering and M.Sc. program head as well as the heads of the Energy and Power Systems track, the Communications track, the Electrical Engineering track, and other faculty members. Engagement in the self-evaluation process led the faculty of the program to examine and refine a number of aspects of the program. In this respect it was helpful to the program and its development.

As part of the self-evaluation process, the Faculty considered the recommendations of the 2007 evaluation committee and the status of actions taken relative to that set of recommendations. The evaluation committee observes that the institution has been responsive, with varying degrees of effectiveness, to all of the issues that were raised in the 2007 report.

Chapter 4: Summary of Recommendations

Advisable Recommendations:

- The committee recommends that the Institute focus on its stated mission as an academic institution with applied research activities and a strong teaching mission.
- The mission of the institution must drive both the teaching and research activities at HIT. High level teaching standards must be maintained even as the faculty are encouraged to engage in applied research activities.
- Evaluation of the faculty should be guided by the mission of the institution. Because the mission is focused on preparing its graduates for careers in high-tech industry, it is important for the faculty to understand that they will be evaluated on their contributions to this mission. Because they must remain current in their discipline, it is also important that a component of their evaluation be related to this as well. The processes whereby faculty are evaluated and the criteria for professional advancement should be more evenly balanced in their consideration of teaching and research.
- The committee recommends that the CHE establish a set of criteria for evaluation of applied research in institutes whose mission is primarily teaching.
- The committee recommends that the administration establish a process by which faculty members who engage in research, advise M.Sc. research, and publish their work in high quality journals are recognized and rewarded for this.
- In 2014, HIT requested a thesis track in the M.Sc. program. The development of a M.Sc. degree with thesis could provide support for research activities by enabling the faculty to attract students who would provide real help in their research and teaching support through their contributions as teaching assistants. It is very important to sustain an

environment that is supportive of the kinds of research that are consistent with the institutional mission.

- Consideration should be given to the development of a funding model that would reward faculty who are advising M.Sc. and Ph.D. students at a university. Such a funding model could also include grants to M.Sc. and Ph.D. students for teaching assistantship at the colleges.
- Faculty at all levels, but especially those who are new to the institution, would benefit for a more formal mentoring program.
- It is important to avoid creating too many tracks within the B.Sc. program. A proliferation of tracks could make it difficult for students to identify an area of focus that is relevant to them. It could also make the task of managing curriculum development less cohesive.
- Before opening any new track, it is very important that the processes to be followed in bringing the new track into being be well thought out. It should be made clearly known to students which courses will be offered and when. It should also be determined that the resources available to support the track are in place before the track is opened.
- Due to the mode of studies students employ in the flexible track, faculty members should be encouraged to include in the syllabus and in their lectures information concerning sources of supporting material that is available on-line. This should be encouraged by the administration and presented to the students in a structured manner in all courses.
- The laboratory facilities of the program should be carefully reviewed. All equipment that is to be used by the students should be in good repair and should have functionality that will give students the kinds of experience that will prepare them to work effectively in industry.
- A complete review of the laboratory infrastructure by an independent evaluator should be done to assess the adequacy of the laboratories for the support of the teaching and research activities of the faculty and students.

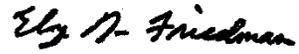
Desirable Recommendations:

- In order to increase the variety of courses in the M.Sc. program, and to make it more cost effective, it is suggested that elective courses could be given in a two-year cycle, so that students can plan ahead for the entire two years of their studies.
- It is suggested that the Institute develop a model for encouraging research activities that is consistent with the mission of the Institute and supportive of the faculty members' need to engage in research in order to attain promotion and maintain technical currency in the discipline.

Signed by:



Prof. Alan Oppenheim - Chair



Prof. Eby G. Friedman



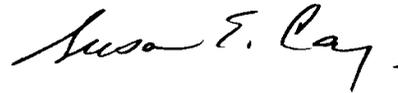
Prof. Ehud Heyman



Dr. Orly Yadid-Pecht



Prof. Mathukumalli Vidyasagar



Prof. Susan Conry



Prof. Roch Guerin



Prof. Dr.-Ing. Walter Kellermann

Appendix 1: Letter of Appointment



December 2015

Prof. Alan Oppenheim
Department of Electrical Engineering and Computer Science
MIT
USA

Dear Professor,

Al

The Israeli Council for Higher Education (CHE) strives to ensure the continuing excellence and quality of Israeli higher education through a systematic evaluation process. By engaging upon this mission, the CHE seeks: 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.

As part of this important endeavor we reach out to world renowned academicians to help us meet the challenges that confront the Israeli higher education by accepting our invitation to participate in our international evaluation committees. This process establishes a structure for an ongoing consultative process around the globe on common academic dilemmas and prospects.

I therefore deeply appreciate your willingness to join us in this crucial enterprise.

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 the study programs in **Electrical and Communication System Engineering**. In addition to yourself, the composition of the Committee will be as follows: Prof. Susan Conry, Prof. Roch Guerin, Prof. Ehud Heyman, Prof. Mathukumalli Vidyasagar, Dr. Orly Yadid-Pecht, Prof. Eby Gershon Friedman, Prof. Dr.-Ing Walter Kellermann.

Ms. Daniella Sandler and Ms. Inbal Haskell-Gordon will be the coordinators of the Committee.

Details regarding the operation of the committee and its mandate are provided in the enclosed appendix.

I wish you much success in your role as a member of this most important committee.

Sincerely,

Hagit Messer

Prof. Hagit Messer-Yaron
Vice Chair,
The Council for Higher Education (CHE)

Enclosures: Appendix to the Appointment Letter of Evaluation Committees

cc: Dr. Varda Ben-Shaul, Deputy Director-General for QA, CHE
Ms. Daniella Sandler, committee coordinator
Ms. Inbal Haskell-Gordon, committee coordinator

Appendix 2: Site Visit Schedule

Electrical Engineering - schedule of site visit Holon Institute of Technology

Thursday 14/1/16

Time	Subject	Participants
9:30-10:15	Opening session with the heads of the institution and the senior staff member appointed to deal with quality assessment	
10:15-10:50	Meeting with the academic and administrative heads of the department of Electrical and Electronic Engineering	
10:50-11:00	Break	
11:00-11:45	Meeting with senior academic staff*	
11:45-12:30	Meeting with Junior academic staff *	
12:30-13:30	Lunch (in the same room)	Closed-door working meeting of the committee
13:30-14:00	Meeting with adjunct lecturers	
14:00-14:45	Meeting with B.Sc. / M.Sc. students	At least 10- members of all years of the program
14.45-15.30	Final Project Presentation	
15.30-16:00	Meeting with Alumni**	
16:00-16:15	Break	
16.15-17:00	Tour of campus (classes, library, offices of faculty members, computer labs etc.)	
17:00-17:30	Closed Door Meeting	
17:30-18:00	Summation meeting	

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

** The visit will be conducted in English with the exception of students who may speak in Hebrew and anyone else who feels unable to converse in English.