JCT Perspective

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A Tradition of Excellence

JCT
LEV ACADEMIC CENTER

Jerusalem College of Technology – Lev Academic Center

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Commentary

We are often asked: "What is the difference between JCT and any other institution of higher education in Israel?" Although this may seem like a straightforward question, it is difficult to give a simple answer, because JCT is unique in so many areas.

To begin to answer the question, we can focus on one special area of excellence. This is JCT's proven track record with industry and the defense establishment. JCT's mission is to provide the technology and defense industries with cutting edge professionals who have the skills needed in both the short and the long-term. JCT actively seeks input from industry in setting its curriculum, and this results in greater marketability for its many talented students.

This practical mindset is intrinsic to JCT and does not end with the initiation of academic programs. At JCT, each department has a steering committee which includes leading representatives from industry. The steering committee then sets the direction for the courses to be offered, which will better prepare the students seeking to work in that particular industry.

In addition, emphasis is placed on enabling our students to gain practical experience with industry even before they graduate. Most students are required to submit a final project in their field of study in cooperation with industry. JCT has been partnering with the largest companies in Israel, including Intel, Texas Instruments and Microsoft. Many students are then employed, after graduation, in the companies where they did their final projects. JCT also places great importance on forging research collaborations with industry in which students participate. This, too, provides our graduates with real-world experience.

It is no surprise, therefore, that our placement office has a success rate of over 90% with our graduates, many of whom have been placed in Israel's largest high-tech companies. This is the result of the sterling reputation JCT has earned over the last 47 years through the knowledge and excellence that our students and graduates have consistently demonstrated.

Recently, the CEO of one of the largest Israeli defense companies paid us a visit. He said that he wanted to see the place where so many of his stellar employees had studied. At the end of his visit, he remarked that not only are JCT graduates superior engineers, but more importantly, they are fine and highly ethical employees. Although such statements are far from uncommon, we always enjoy hearing that our hard work has paid off.

Stuart Hershkowitz
Vice President

President's Message

Life is all about role models. The behaviors of both institutions and individuals are often anchored in the examples provided by family members, teachers, friends, or leaders. The people with whom we interact, along with their values and behaviors, play a powerful role in shaping our lives. This is how we train our children, our students, and our employees.

The Torah recognizes the impact of role models in recounting the influence that our forefathers would have on future generations. Jewish law does not rehabilitate using prisons, but rather prescribes living with normative families or in a city of refuge populated largely by priests and Levites, the teachers of the Jewish people. We all need positive role models.

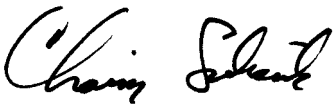
JCT's history is rich in leadership figures who have served as role models for their students and colleagues. In its 47 years of existence, JCT has produced an extraordinary number of leaders in the IDF and in Israeli hi tech. Current staff members also provide powerful models of high academic and professional standards and of the Jewish values to which we aspire.

Being a role model is not limited to an elite few. Over the years, JCT graduates have made a name for themselves. Particularly in areas where we have a dominant presence – such as electro-optics laboratories in government and defense industry companies— being identified as a JCT graduate carries with it a special status in terms of professional excellence and leadership, alongside an exemplary work ethic and ethical standard.

Our students and alumni from the Ethiopian and Hareidi communities report that in addition to the satisfaction and pride they feel in their personal achievements, many of them have also become role models. For the most part, they remain strongly connected to their families and communities, and their success encourages others to follow in their footsteps. The multiplier that is thus achieved in terms of the social impact of these special programs magnifies the importance of our investment in these students. Recently, we held a dinner in honor of the 18th anniversary of our "Education for Ethiopians" program. It was an inspirational event that brought together several generations of the "Eda" and its leadership and showed very clearly how providing these students with a high quality academic education has paid dividends in terms of their personal success and in its broader impact on their community.

As we approach Rosh Hashana, we must embrace our responsibility to be positive role models, both on a personal and an institutional level. As you peruse this magazine, I hope you will share our sense of pride in what JCT has accomplished and will see yourselves as our partners in addressing the challenges that lie ahead.

May you and your families be inscribed in the Book of Life for a healthy, happy and peaceful New Year.



Professor Chaim Sukenik
President

Rav Natan Bar Chaim has retired after over 45 years as Head of the Bet Midrash on the Lev Campus. Rav Bar Chaim was instrumental in teaching and guiding thousands of Lev students throughout their studies and continues to have a strong bond with many graduates to whom he gives shiurim several times a year. JCT is extremely grateful to Rav Bar Chaim for his many years of devotion to students of the Bet Midrash and we wish him good health and prosperity in his retirement.

Interview

An Interview with Rav Yosef Zvi Rimon, the new Rabbinic Head of JCT

JCT is proud to welcome Rav Yosef Zvi Rimon as our new Rabbinic Head. We wish him much success in his new position and we look forward to seeing JCT continue to grow and thrive under his guidance.

What is your vision for the Rabbinic Head of the Jerusalem College of Technology?

My vision is to instill in the students a sense that they are on a mission – a mission of Torah, of values and of *Chessed* (kind deeds). My hope is to inspire each student to be a messenger of G-d and of the people of Israel and to live a life of Torah in the fullest sense. Torah is the light which illuminates life, and through that force they should be empowered to perform all their tasks, academic as well as professional, in the most ethical and honest way possible.

This mission is not only relevant for educators, but rather every person needs to be a messenger of G-d. Every individual needs to have a strong moral and ethical foundation. Our students themselves will eventually raise families and will become role models for their own children. In that sense everyone is an educator.

This mission expresses itself in many of the choices we make in our daily lives. For instance, when one seeks a place of employment, one can choose to work at a place where one can contribute more, or take a job where the object is simply to earn more money. There are also many important decisions to make in life (where to live, whom to marry). In every situation, one can choose to live according to Torah values, at work, in the community. Choosing to live a life of Shlichut, as an emissary of G-d, is what will give meaning and purpose to one's life.

Why did you choose to come to JCT?

I am a rabbi of the Alon Shvut community. I was teaching at the Har Etzion Yeshiva and was also the director of the Halacha Education Center. My work involves a wide range of different activities and I wasn't looking for anything else.

When I was initially approached by the Jerusalem College of Technology, I was impressed by the many achievements of JCT. I understood that here was a unique opportunity to create emissaries of Torah and Halacha who were also skilled in science and technology. They could be a force for good in the modern world as well as being loyal messengers of Torah values.

JCT is a leader in many areas. Given its many strengths and its great potential to develop in even more significant areas, this encouraged me to want to be part of this process and to accept the position.

Torah and Academics?

On the one hand, for the last 20 years I have taught in a place that solely concentrates on Torah. From seven in the morning until midnight, only Torah is studied. This is powerful, unique, and important. On the other hand, I believe that it is also imperative to develop and enhance the world. There is a special light that illuminates the world when this is done by people who immerse themselves in Torah.

Where I taught, some stayed to learn Torah and others went on to study something else. At JCT, the Torah is studied for half of the day. The fact that it is already part of their day-to-day routine enables students to continue to integrate Torah into their everyday lives.

When a student leaves an environment of only Torah and enters into ordinary life, the change can be very difficult. Here at JCT, the daily combination of Torah and academic studies can help strengthen the Torah side of his life. This combination can bring the entire Jewish people closer to repairing the world (*tikkun olam*) for the kingdom of G-d.

Educational Motto?

Put the Almighty in the center of your universe. When you study Torah and while dealing with any aspect of your everyday life, always try to do your best.

How will this connection influence your activities?

The *Batei Midrash* at JCT are going to be run with this principle in mind. I believe that the study of Torah and how it is practiced in the world are connected. As we strive to fulfill our mission of kind deeds, these forces of Torah and academic excellence will only strengthen each other. And of course, that requires a lot of help from Above.

What are the major goals for Religious Zionism to achieve?

I believe that Religious Zionism should be a major and significant aspect of society. The Torah must

Interview

An Interview with Rav Yosef Zvi Rimon, the new Rabbinic Head of JCT

branch out into all other areas of life. But this should be done in such a way that wherever we are, the people around us will be able to feel that at our core lies the deep wisdom of Torah. In terms of the scope of Religious Zionism, we are being successful. This is evident in the fact that Religious Zionists are to be found in all aspects of life in Israel, as academics, as leaders in society and as Torah sages. I believe, though, that there are two important areas in which we need to intensify our efforts and to do better.

The first is in our connection with the secular world. This task presents a challenge, because we want to connect and be close, yet, on the other hand, we know that we will not diminish or relinquish the values of the Torah. The way to succeed in establishing this connection is not by diminishing our religious power, or by reducing our language, but by trying to forge a common language, which comes from the understanding between man and his fellow. As we widen our interaction with more sectors of society, we will create a significant and meaningful connection. Everyone who sees a Religious-Zionist person will feel the positive values of morality and honesty we live by. When we succeed in instilling those attributes by living them, we will create a significant connection with others.

The second task we need to concentrate on is related to our impact on the world of Halacha. Combining Torah and science and our relation to the land of Israel and to the army is complicated. I believe that the right way is to integrate these values. We can find this kind of integration in the Bible and throughout Jewish history. On the other hand, if we are not fully rooted in Jewish law, then we will have failed in our mission. Our success will be measured by sustainability. There are many successes possible, but along the way there are also many problems. If we succeed in this integration while remaining true to Halacha, this will truly be the ideal way.

What is the difference between religious education today and that of the past?

Over the last decade or two, there has been a tremendous change in our youth. There is great turmoil, which can lead to a lot of good but also has many dangers. There are various reasons for this change. Some of it is due to the digital revolution with its Internet, Facebook, etc. The positive side of this is that it has created youth that is more thoughtful and involved – more open to questions and clarifications than any previous generation. Today's youth is not like the fourth son in the Haggadah who "does not know how to ask". Rather, this youth wants to ask and knows how to ask. It is a generation with a deep and gentle soul, a generation of young people who are looking for themselves but yearn for something strong that can anchor them. There is no doubt that this has caused a revolution in education. Some things are rising while others are declining.

If we are wise enough to examine what really suits the student's inner soul, we can make intelligent use of these technological advances as tools to climb higher. We should be aware of the dangers and difficulties, but we must also believe in our youth and in our students, with their abilities, their goodness, and their great soul. From this perspective of love and with G-d's help we will succeed in the task.

Rav Rimon in the shmita park at the Botanical Gardens, Jerusalem

Dvar Torah

by Rabbi Adi Isaacs

There are a number of Torah laws that have been absent from the general Jewish curriculum for generations. This applies, for example, to the laws of *Shmita* (the sabbatical year, when the land lies fallow once every seven years). Because *Shmita* was not practiced for so long, it was more or less glossed over. It was only when Jews returned to live in the Land of Israel that we began once again to delve into this aspect of religious law. In contrast, such issues as monetary laws and *Yom Tov* were discussed and written about continuously.

When we rebuild the *Beit Hamikdash* (Holy Temple) in the near future, two further laws that have fallen into disuse with the destruction of the Holy Temple will once again become integral components of daily Jewish practice. These are the laws of *Tumah veTahara* (impurity and purity)[1].

The *Rambam* (Maimonides) at the end of Laws of the *Mikveh* (ritual bath), chapter 11 section 12, clarifies that the laws of purity are defined as a *Chok*, a Jewish practice too esoteric and profound for the human intellect to grasp. This might seem ironic, as the Rambam was at the forefront of the philosophy to delve into the rationale of the *Mitzvot*. In fact, he posits at the end of *Meila Halachot* (Fraud Laws)[2] that it is a Jewish obligation to strive to understand the nuances of each Jewish principle in order to fully integrate the *Mitzva* and its ideology into one's life. Therefore, although the laws of purity are intricate and humanly incomprehensible (even according to the Rambam), is there any way that we can use our power of human comprehension to appreciate purity and make it even more meaningful?

Rav Shimshon Raphael Hirsch, the intellectual founder of *Torah Im Derech Eretz* (the combination of learning Torah with earning a living), asked two fundamental questions at the beginning of the weekly Torah portion, *Tazria*: What is the rationale for a woman becoming impure after going through childbirth? Furthermore, why does a woman who gives birth to a female remain impure for twice the amount of time as that for a male?[3]

Rav Hirsch theorizes that the concept of impurity arises when there is a vacuum of *Kedusha* (holiness). The *Gemara* explains that the highest level of impurity is that of a dead body. Rav Hirsch continues that this body was full of potential Kedusha, the ability to do kindness, learn Torah, and be a role model. When the soul leaves a body full of potential, there is now a tremendous absence of holiness. *Tumah* (impurity) is what comes to occupy the place of the *Kedusha* in that vacuum. A *Yoledes* – a mother who bears a child – has inside her an extra entity full of potential before the birth. When the newborn child leaves the womb, it creates a vacuum of Kedusha, which is subsequently taken over by impurity. A female child creates double the amount of impurity, because a female has her own intrinsic *Kedusha* and the ability to create more *Kedusha* (children) in the future. Therefore, when a female child leaves the womb, a dual vacuum occurs, creating a *Tumah* that lasts for twice as long.

Once we understand the concept of *Tumah* – the vacuum that is created by the lack of *Kedusha* – we can attempt to suggest what *Tehara* (purity) represents. Ultimate *Tehara* is when one takes potential and actualizes it for good; it is when one takes his inner abilities, strengths, and qualities, and uses them to better himself and the world around him. The highest level of *Tehara* is when one can unite the physical and the spiritual realms. *Tehara* at its best represents a true appreciation and understanding of Torah values, united with one's ability to actualize his potential to create a better world.

Jews believe that Israel is the epicenter of the world. At JCT - Lev Academic Center, we are blessed with a unique opportunity to help *Bnei Yisrael* achieve this ultimate *Tehara* in helping mold *Bnei Torah* into individuals who look to the Torah as their rock, while standing at the forefront of Israel's technological innovation and security. May we continue to help create leaders who bring greater *Tehara* to Israel and to the entire world.

1 These laws are derived mainly from the Torah portions of *Tazria* and *Metzorah*

2 'It is good that a man examines the laws of the holy Torah and studies them thoroughly in accordance with his ability. And an issue that he cannot explain should not be viewed by him as insignificant' *Meila*, Chapter 8, Law 8

3 The beginning of Parashat *Tazria* (Leviticus, Chapter 12, Line 1)

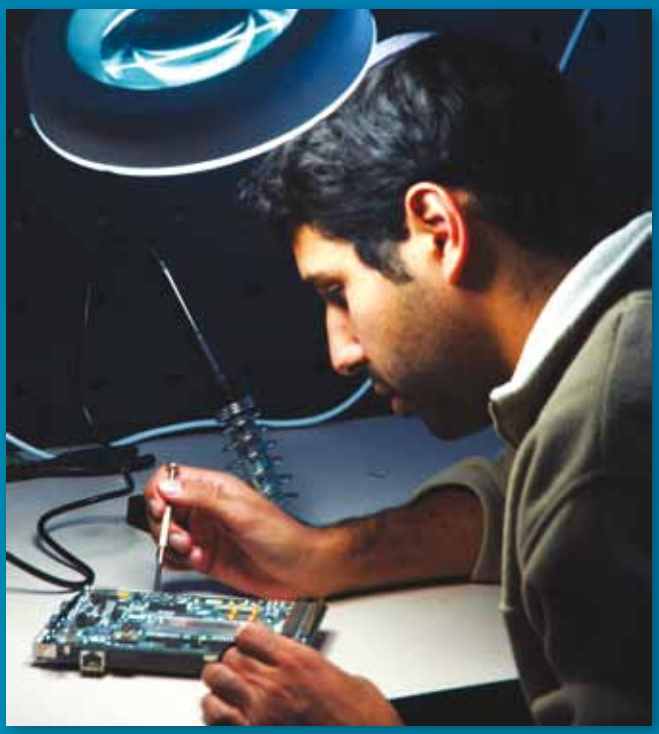
Rabbi Adi Isaacs made Aliyah with his family in 2008 after graduating from Yeshiva University. Rabbi Isaacs joined JCT as the Associate Director of the International program in 2013. Rabbi Isaacs and his wife live in Jerusalem and are proud parents to their four children.

JCT's Foundation of Excellence: All the Rest is Commentary

by Sandy Cash

When commercial companies from Israel and the European Union, and even as far away as China, turn to a small Jerusalem college to solve their technological puzzles, it's a sign that this college is something special. And indeed, the special relationship between JCT and Tabor Technologies – a private outsourcing company founded on the campus of the Jerusalem College of Technology in 2013 – has already demonstrated how an outstanding educational environment can serve as a springboard for success. According to Tabor founder and CEO, **Dr. Asher Peretz**, research outsourcing is just one way in which the College's core values of academic excellence, professional training and Jewish spiritual commitment come together for the benefit of all.

"We employ JCT students and alumni, putting them to work on projects we get from small and medium-sized companies who don't have their own R&D facilities," says Peretz, a physicist who for ten years was a member of the College's teaching faculty. Pointing out that one of Tabor's clients is Mishmeret HaShabbat, a designer of *"Shabbat-friendly"* electronic solutions, Peretz is proud of how Tabor funds student scholarships, and also aids in the commercialization of technologies emerging from JCT research. *"Partnering with the JCT community allows us to contribute to the College's unique educational goals, while taking advantage of its outstanding knowledge base."*



Diversity and Devotion

So what's so special about JCT? Founded in 1969 as an academic framework for students wishing to train as engineers while continuing their religious studies, JCT now offers study tracks in a range of disciplines, including nursing, telecommunications, bio-informatics and entrepreneurship.

As the years have gone by, JCT has also expanded its reach, becoming the go-to institution for women and men who for religious reasons would not feel comfortable in other learning environments. The very existence of these specialized programs changes lives for the better.

"Young people from the haredi sector are increasingly seeking out the training that will allow them to achieve their personal goals and contribute to society; and we support that," says **Prof. Kenneth Hochberg**, JCT's newly-appointed Rector. *"So, in addition to Tal and Lev – our flagship separate campuses for women and men – we launched Naveh, a program geared toward older men with strong yeshiva backgrounds. We also offer several tracks specifically for haredi women: Lustig, Da'at and Tvuna, where Yiddish speaking women study both computer science and business administration."*

To Learn, to Excel, to Contribute

Last year, JCT inaugurated a program designed to identify and nurture the talents of its very brightest students. Called *HaEytanim* – from a Hebrew word meaning "strength" – the initiative will grant 20 - 30 young scholars opportunities to enhance their skills and prepare themselves for the working world by participating in one additional, specialized course each semester.

"Operating simultaneously on our men's and women's campuses, the goal of HaEytanim is to train tomorrow's business and industrial leaders," says program head **Rabbi Dr. Avi Karsenty**, adding that entrance to the program is competitive, and once accepted, students must maintain a high grade-point average to continue. *"In the eight special courses that HaEytanim participants take, the students learn to focus on interdisciplinary issues such as creative thinking, entrepreneurship, and the place of Jewish values in the business world. In addition, they participate in special industry seminars and site-visits and receive practical training in a variety of job-related skills. This provides potential employers with skilled engineers who are prepared to integrate quickly into a new working environment and make a contribution."*

Like the new program, JCT's general curriculum is also built around providing a healthy balance between academics and practicality. As part of their studies, students must complete supervised final projects in which they develop original technologies in partnership with professional mentors. Such projects give JCT graduates a jump on future employment, with a high percentage of participating students establishing a working relationship with industrial firms even before they finish their degrees.

Students aren't the only ones who benefit from this arrangement. The IDF's Home Front Command recently turned to JCT, asking for a solution to a pressing military challenge. They got the answer they needed in the form of a project prepared jointly by fourth-year electrical engineering students **Uri Kobi** and **Yaakov Lankry**.

"We created a way to map the landings of missiles fired from Gaza into Israel, based on the automated analysis of acoustic signals," says Kobi, who is part of an IDF program in which students complete an academic degree before beginning their active army service. *"Rather than waiting for civilians to report where a projectile hit, our system alerts emergency teams immediately, something that can save lives."*

Kobi's partner Lankry explains how this project, which was supervised by JCT instructor **Dr. Shimon Mizrachi**, provided him with valuable experience of the working world. *"Engineering is all about tackling real-world problems, and this gave us an opportunity to make a contribution, even before graduation,"* he says, adding that he has already found employment with a Jerusalem technology firm.

In another outstanding project, **Tchiya Dayan**, a graduate of JCT's Lustig program for women from the haredi sector, created a verification solution for microchip design. Dayan's project, in which she partnered with another student from her program, was supervised by JCT faculty member **Dr. Dan Bouhnik.**

"Working with a satellite company, we created a quality assurance system designed to make sure that microchips, once produced, will perform as intended," says Dayan, who also completed a teacher's certificate while earning her degree and taught

Meet the Rector:
Prof. Kenneth Hochberg

As a mathematician who specializes in probability, **Professor Kenneth Hochberg** knows that achieving a specific outcome depends on how you roll the dice. But when it comes to increasing the probability of achieving academic excellence, Hochberg – who joined the Jerusalem College of Technology as Rector in 2014 – will tell you that the formula is fairly simple. First, he says, you have to define your goals. Then you need to pursue them, leaving nothing up to chance.

"There are sixty-six colleges and universities in the State of Israel today, and while every one of these institutions strives for excellence, they each have different target populations and different standards for success," says Hochberg, formerly Dean of the Faculty of Exact Sciences at Bar-Ilan University as well as the Academic Head of both the College in Ariel and the Jerusalem Haredi College. "One of the most exciting things

computer science at Talya, JCT's high school program for girls. *"Large-scale manufacture of computer chips can cost billions of dollars, so the more automatic the verification process, the fewer mistakes, and the more money is saved."*

Research Excellence – It's in the Blood

Students and alumni are not the only members of the JCT community who are having an impact. Many faculty members balance their teaching duties with high-level research conducted together with collaborators from academia and industry in Israel and around the world. Two recent achievements demonstrate how JCT innovations are creating the technologies of tomorrow.

Professor Meir Nitzan, emeritus member of the Department of Applied Physics, is an expert in medical optical engineering. In 2013, he introduced a novel technology for measuring blood pressure with unprecedented accuracy. Recently, he demonstrated how his system can contribute to human health by reducing the risk of cognitive impairment and dementia among elderly people.

"It is well known that hypertension increases the risk for stroke and heart disease," says Nitzan, former head of JCT's Medical Optics Research Center. *"But if blood pressure is brought down too far, the reduced blood flow to the brain can interfere with cognitive function. Our technique, which is based on an electro-optic sensor placed on the patient's finger downstream of a standard pressure cuff, allows doctors to make the proper diagnosis and monitor follow-up, while avoiding the overly-aggressive treatment that can lead to dementia."*

about JCT is its uniqueness: our goal is to offer academic and technical training on the highest level in an environment that supports students' religious standards and their spiritual growth. It's a challenge, it's also a win-win: our students get the outstanding education they want, and after they graduate Israeli society gets the highly-trained professionals it needs."

According to Hochberg, the success of JCT's educational model depends on attracting faculty members who have a special combination of skills. "Rather than the 'publish or perish' pressure experienced by scholars working at research universities, we put our greatest emphasis on teaching ability," he says. "At the same time, JCT faculty members head research labs, publish their findings in prestigious journals, and are involved in developing new ideas and technologies and bringing them to market. In fact, JCT has historically conducted more high-tech research than any other college in the country. This gives our students – who study in relatively small classes – the chance to absorb not just the facts, but valuable professional experience."

Trained at Yeshiva and New York Universities, Hochberg is married to a Stern College and NYU alumna, and is the proud father of four adult daughters who, between them, hold two medical degrees and two PhDs. But while he and his family received their education in pluralistic, open environments, Hochberg believes that small, religious colleges that cater to specific sectors of the population have an important mission.

"There is a revolution of inclusion that is driving the Israeli economy forward," he says. "By creating specialized frameworks in which religious men and women can attain top-flight training, JCT provides an avenue for more than just personal success. It prepares our students to take their place in society as leaders."

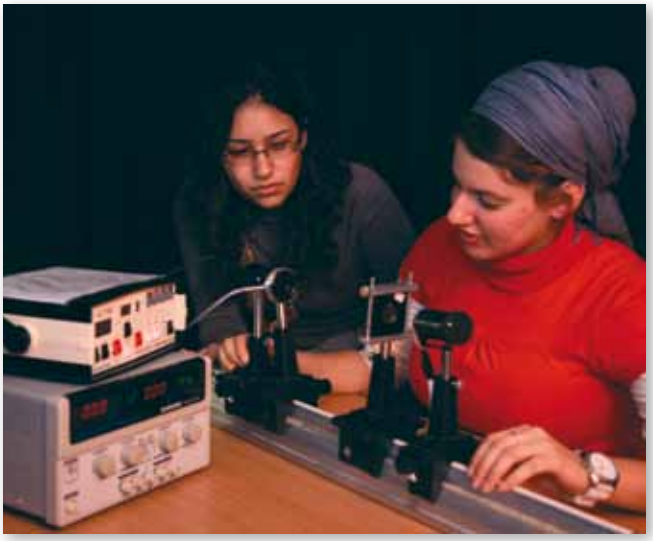
The technique is slated for clinical testing in hospitals in Israel and around the world, in collaboration with experts, including a specialist in geriatric psychology. The value of the method is in its ability to reduce the risk of cognitive impairment not only in the elderly, but in younger hypertensive patients as well.

"Using this tool, patients in their 40s or 50s can get a highly accurate measurement of their blood pressure," Nitzan says. *"This makes it possible to create a personalized treatment plan for hypertension – something that would bring blood pressure down without causing future cognitive damage."*

Cross-Discipline Collaboration

In another faculty project, **Dr. Avi Rosenfeld**, of the Department of Computer Science, is developing a technique for predicting the likelihood of the onset of cancer in individual patients.

"Together with our colleagues in the UK, we're creating an interdisciplinary approach for predicting esophageal and gastric cancers," says Rosenfeld. *"These types of cancer have a particularly dire prognosis, so our goal is to identify high-risk individuals who can be treated using minimally invasive endoscopic techniques before the cancer appears."*



The name of the game, Rosenfeld says, is complexity, and that is where data mining – a branch of computer science that concentrates on discovering patterns in large data sets – comes to the rescue.

"Cancer onset varies from patient to patient and is linked to so many factors that it represents a huge computational challenge," he says. *"Therefore, we're developing artificial intelligence (AI) techniques to analyze everything from RNA expression, to next-generation sequencing, to symptom data collected from patient questionnaires. Eventually, we hope to integrate these multiple data sources into a predictive system that can 'learn' from experience and form the basis for accurate population screening."*

The Winning Formula

The merit of an educational institution is measured not by the number of people who pass through its gates, but by its ability to formulate and stand by its unique mission. By bridging the gap between academia and the working world while maintaining the highest standards, and responding pro-actively to societal trends, JCT has established itself as a leading example of educational excellence for the religious population. As an institution that keeps Torah Judaism at the center of its campus culture, JCT sends its students out into the world with something else that's special: the knowledge not only of where they're going, but where they're coming from.

No High-School Student Left Behind

Recognizing the importance of nurturing academic excellence from an early age, JCT is continuing to expand the programs available in its boys' and girls' high schools. Already challenged by a rigorous curriculum in which they complete their undergraduate degrees in computer science by the end of grade thirteen, students at these institutions will soon be able to choose from a variety of disciplines, including physics and electrical engineering. At the same time, JCT is reaching out to talented youth who attend other schools, by offering a weekly program for those interested in learning computer science on a part-time basis.

How We've Grown!

Long recognized as one of Israel's premier schools of engineering and computer science – the disciplines upon which the school was founded in 1969 – JCT has judiciously expanded its course offerings. Today, the College also offers bachelor's, master's and certificate programs through the Schools of Management and the School of Life and Health Sciences.

That JCT's curriculum is on target is seen in the statistics: despite rigorous admissions standards – less than half of the students who apply are accepted – over the past five years, enrollment grew by 35%. There was also significant growth in the number of haredi students, indicating the important role JCT is playing in helping these students support their families by becoming trained professionals in a Torah-observant atmosphere.

JCT's nursing program – initially established for women only – recently absorbed the nursing school of Jerusalem's Shaare Zedek hospital. The JCT program is now over-enrolled in gender-separated tracks, with both men and women pursuing academic degrees and certificates in medical sub-specialties.

Another highlight is the Health Science division's newly-established pre-med program, which prepares students to join four-year medical schools either at Tel Aviv University or on the Safed campus of Bar-Ilan University.

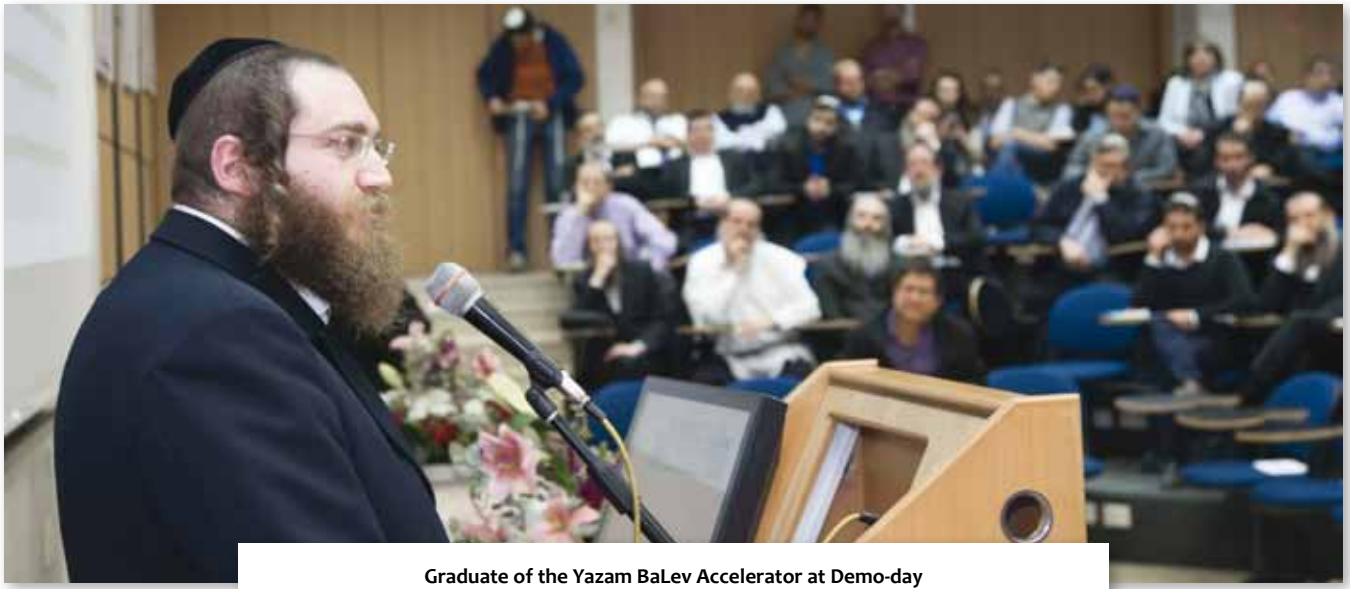
Entrepreneurship

JCT's Haredi Hi-tech Accelerator Completes First Cycle

In April, there was a Demo Day for the first class of Yazam BaLev, JCT's haredi hi-tech accelerator. Yazam BaLev is the first haredi-focused accelerator and provides support and training to help haredi would-be entrepreneurs realize their innovative ideas.

During the event, participants presented their concepts to managers and investors from the hi-tech world. **Nir Barkat**, Mayor of Jerusalem, who is himself a successful entrepreneur, praised the initiative and welcomed it as an important addition to Jerusalem's burgeoning start-up community. The participants included JCT graduates, a few former and current kollel students, a *Breslav hassid* holding a PhD in Physics, and a practicing Dayan (Rabbinical judge) in the Rabbinical court system.

The projects covered a wide range of software and hardware applications, including innovations for secure electronic invoicing, retrieving lost car keys, social discount/promotion-sharing, fast printing, as well as a new solar powered engine and an already operational start-up for dashboard creation. The next Accelerator cycle is due to open in the fall, once again under the directorship of Ben Wiener of Jumpspeed Ventures.



Graduate of the Yazam BaLev Accelerator at Demo-day

Canadian Friends of JCT Annual Gala Honors Finance Minister Joe Oliver

More than 400 guests attended the Canadian Friends of JCT annual gala event, held earlier this year, where Canadian Finance Minister, **Joe Oliver**, received an honorary degree.

Left to right: Simmy Zieleniec, CEO, Canadian Friends of JCT, JCT President, Chaim Sukenik, Finance Minister Joe Oliver, and former Foreign Affairs Minister John Baird. HUDSON TAYLOR PHOTO

In addition to honoring Oliver, Awards of Merit were presented to three Toronto philanthropists: **Toby Feldberg, Honey Sherman**, and **Judith Shamian**, President of the International Council of Nurses. **David Anisman**, a longtime supporter of the group, who celebrates his 100th birthday next month, was also honored.

Also in attendance were two Canadian dignitaries who have previously received honorary degrees from JCT: Defense Minister **Jason Kenney** and **John Baird**, who recently stepped down as Foreign Affairs Minister.

The President of the International Council of Nurses, **Dr. Judith Shamian**, who is an outstanding figurehead in the health services field, has recently been elected to the JCT Board of Trustees. Dr. Shamian has already "rolled up her sleeves" and is providing JCT with insightful guidance with our health services programs and research. She will be involved in forming the program for the Tal Campus, and especially the health and life sciences programs. We are deeply honored to have Dr. Shamian on board.

Award of Merit recipients: Judith Shamian ,Toby Feldberg, and Honey Sherman

US Ambassador to Israel Visits JCT

Left to right: US Ambassador Dan Shapiro, a JCT student, Director General Shay Gilboa and President Professor Chaim Sukenik

Earlier this year, **Mr. Dan Shapiro**, US Ambassador to Israel, visited JCT to advance JCT's collaboration with the American Embassy and US companies. During his visit, Mr. Shapiro was apprised of JCT's academic and research activities and innovations. Ambassador Shapiro expressed his admiration for JCT's ability to offer courses for diverse segments of the Israeli population, including religious Zionists, *haredi* women, new immigrants from France and Ethiopia, and *haredi* men, who combine academic studies with army service.

Visits & Events

The Reuven Surkis Program for Students from the Ethiopian Community Celebrates 18 Years of Success

A special evening celebrating 18 years since the establishment of the program for integrating Ethiopian Israelis into academia was held in June at the Lev Campus of the Jerusalem College of Technology. JCT was one of the first educational institutions to embark on such a program in Israel. It started with a handful of students and has since graduated 128 men and women, 55 of whom hold Master's degrees. The guests of honor at the event were **Reuven Surkis**, initiator of the program and former Vice President of JCT, **Kes Kasu Zimru**, the Chief Rabbi of the Ethiopian Community in Kfar Saba, and Member of Knesset **Dr. Avraham Negusie**. The son of the Kes, Shmuel, is currently in his second year of studies towards a degree in Electro-Optics Engineering at JCT.

The program boasts an employment rate of 98%, including 86% of graduates finding employment in their fields of study and two majors in the IDF. All graduates with Master's degrees are employed in their fields. There are currently 135 students in the program (including 66 women) who receive stipends for living expenses, tutorial support, professional guidance (a social worker and a psychologist), courses for empowerment, financial management and family life, as well as specialized heritage courses with **Rabbi Yosef Adane**, Chief Rabbi for Ethiopian Israelis.

During the event, MK Negusie and **Major Yoni Wotta**, a graduate of the program, addressed the students and spoke of the importance of advancing through academia. The event also provided the perfect opportunity to honor supporters of the program, including the **Gandel Foundation, Glencore Fund, Maurice and Vivienne Wohl Philanthropic Foundation, Mincha Lemochora, Moshal Scholarship Program, Orion Foundation, P.E.F., Perot Hallan Fund, Rochlin Foundation, Rozensweig-Coopersmith Foundation, Samis Foundation, Samuel and Bella Sebba Charitable Trust, Jewish Federations of North America**, and many others.

David Cassel, Reuven Surkis and Maj. Yoni Wotta

Dr.Avraham Negusie and students

Kes Kasu Zimru

Awards & Achievements

JCT Students Develop System for Israel's National Insurance Institute Division for Terror Victims

The system, developed by two students at JCT's Tal Campus, oversees management of information related to victims of terrorist attacks.

The Division for Terror Victims of the National Insurance Institute recently implemented an information management system developed by **Kinneret Bouhadana** and **Osnat Dreyfus**. Both students, who recently made aliya from France, developed the system as part of their studies towards an engineering degree at JCT.

During their Software Engineering studies, students chose projects and faced unusual challenges. *"Last year we selected a final project from a number of options, one of which was the BI project for the National Insurance Institute,"* said Bouhadana. *"I hadn't been introduced to the subject during my studies and I decided that it was worth studying, but I needed to fill in some gaps."*

As part of a joint initiative between Mia Computers, representative of SAS Israel, and Tal Campus, they met with **Michael Klein**, Manager of the National Insurance Information Center Unit, who explained the organization's needs. After Mia Computers provided the students with SAS software training, the project got underway.

It encompassed the design and implementation of a Business Intelligence (BI) system from the ground up. Bouhadana and Dreyfus followed a specification document and over the past year they developed four areas of BI used by the National Insurance Division. The system handles all the information managed by the Division for Terror Victims. This includes data regarding where the attacks took place, the place of residence of the victims, etc. The new system prevents duplication of information and minimizes the possibility of error.

Miri Folk-Rosenbaum, Head of the Division for General Implementations in the National Insurance Institute, stated, *"When Michael Klein presented me with the request from Tal Campus and Mia Computers to integrate students in projects, I saw a wonderful opportunity for the community to contribute to the National Insurance Institute, to encourage immigration and to benefit from it. The project was launched after receiving the blessing of CTO Yehuda Sarussi."*

Klein explained: *"We lacked management information regarding victims of terrorist attacks. Thanks to this project, we now have this vital information. We were able to discover our errors in handling the data and correct them. This subject is very important and we have recently begun using the system in our daily work. In the future it will be integrated into the overall BI system of the National Insurance Institute."*

Folk-Rosenbaum added: *"In light of this successful experience, other departments of the National Insurance Institute have expressed interest in expanding the project and bringing in more students from other fields, utilizing a variety of software tools."*

Eti Stern, Head of Campus Tal, emphasized that *"The integration of students in the National Insurance Institute has greatly contributed to their professional experience, and we hope that it will lead to further cooperation on other projects."*

(Translated from an article that appeared in: http://www.pc.co.il/it-news/183295/)

Job Placement Activities

At a recent JCT job fair, 25 leading high-tech companies, accounting firms and industry representatives met with over 300 JCT graduates and students. *"These are strong candidates with good grades who are highly motivated,"* noted Check Point's recruitment team. A representative of the **IAI (Israel Aerospace Industries)** added: *"We greatly appreciate JCT as an academic institution, and the graduates who come to work for us. Many of our projects are long-term, which requires us to train employees over a long period of time. JCT graduates have stability and are settled in their ways, so they are highly suitable for us. We already employ several dozen."* The representative also noted that one of the features that characterize JCT graduates is their practice of learning together (*Hevruta*). *"Contrary to the great competitiveness that I witness among employees in other companies, graduates of JCT are friendly, helpful and, first and foremost, happy to share information. Since the aerospace industry encourages camaraderie, this ethos is very pertinent for us ".*

JCT's job placement programs are funded by the Shirley and William Fleischer Family Foundation and the Jewish Federation of St. Louis.

Awards & Achievements

3D Camera Detects Violence against the Elderly and Calls for Help

Following a year during which severe cases of elderly abuse were reported in the press, a unique development by JCT students, in collaboration with GeronTech, seeks to combat the problem. The innovative devise features an advanced three-dimensional camera that sends real-time alerts when detecting that violence is in progress. The technique was developed by **Eliya Strasser** and **Aryeh Striech**, students of JCT's Electronic Engineering Department.

Unlike the surveillance cameras currently on the market, which document events of violence, the new three-dimensional camera was developed to provide real-time alerts by identifying indications of violence among people in a room utilizing the room's particular depth. By utilizing sophisticated algorithms, the camera identifies the movements of the room's occupants and analyzes them. As soon as the system suspects an act of violence is in progress, it sends an immediate alert to the supervisor.

For example, in the event that the camera detects the hand of one of the room's occupants moving abnormally and at a significantly rapid pace, or if the system detects a sound that is abnormally loud that may indicate verbal violence, the system will identify the event as potentially violent and send a notification in real-time. To prevent false alarms, the system will only send alerts of physical violence if it detects rapid movement in the vicinity of another body. In cases where the system detects signs of both physical and verbal abuse, the system classifies the event as high-risk and sends a more urgent immediate alert.

In order to avoid intrusion of privacy while still ensuring protection, the video recording cannot be viewed in real-time. Rather, the system operates solely via alerts. It archives recordings and deletes those without alerts. However, when it detects any signs of violence, it saves the footage of the time of the alert and several minutes prior. This means that video footage is viewed only when necessary and can be used subsequently as evidence of foul play.

"In recent years, many videos of abuse of the elderly by their caregivers have been publicized, and public awareness is increasing," says Aryeh Striech. He adds: *"When we were contacted by GeronTech, which works to improve the quality of life of elderly people through collaboration with educational institutions for developing technologies for the protection of the elderly, we sought to address their pressing needs and eventually decided to develop this product. We were looking for a solution that would not compromise the privacy of the elderly, as hidden cameras tend to do, but still provide them with the utmost security."* He also notes that the technology can be adapted for the protection of infants and for any situations involving caregivers.

Translated from an article that appeared in:
http://www.nrg.co.il/online/13/ART2/702/831.html?hp=13&cat=137&loc=30

Nursing Program for Haredi Men

Following eight successful years of training academic nurses at Tal, the JCT Nursing Department opened a nursing program for men at the Lev Campus. There are currently 70 men enrolled in the program, 35 of whom identify themselves as Ultra-Orthodox (haredi). During the program they study anatomy, genetics, statistics, biochemistry, and other subjects. By the end of the program they will become qualified nurses with BSN degrees (Bachelor of Science in Nursing).

Shaul, 35, a participant of the program said: *"I've wanted to do something in the medical field since I was a boy, but I didn't really have a way of accomplishing that, so I decided to volunteer for MDA. When I heard about [the program at JCT], I jumped [at the opportunity]."* With a smile, he adds, *"It gives me a chance to support my family with dignity and also engage in the medical field, which has always appealed to me. I think it's good for me and good for the public in general, and this is proof that you can spend your days doing charity and mitzvot and still earn a decent living."*

Matan Nutzki, 29, another participant in the program, states: *"I always wanted to study nursing or another career in the medical profession, but it was not accessible to me. When this track opened, it was perfect for me. I love it. Now things are hard, but it is preparing me for a better future."*

According to **Benyamin Tzair**, a senior nurse in the Intensive Care Unit at Shaare Zedek Medical Center and Head of the Nursing Track at JCT, once Shaul and Matan graduate, *"they will have no problem finding a job; there is a demand among the haredi community for male nurses."*

In order to enhance the employment options for future graduates of the program, JCT and Herzog Hospital are partnering to enable nurses to graduate with a specialization in Geriatric or Psychiatric Nursing. This special program is an enriched clinical experience, closely supervised by senior staff members from Herzog Hospital's Geriatric and Psychiatric departments. It includes lectures, bedside teaching and course work. The program is supported by **Editha Samson and the family of the late Heinz Samson** and provides generous scholarships to qualified participants. Students will be employed as auxiliary staff to gain extra practical experience and upon graduation will be offered full-time positions as nurses at Herzog Hospital. Similarly the **John N. Insall Orthopedic Track** will give nursing students the opportunity to gain specialised experience in this field.

According to Tzair, the real difficulty for haredi students in the program is catching up: *"Some of the students come with little or no familiarity with secular studies; it is not simple to take on such intensive studies, especially since they must combine it with religious studies in the morning."*

To help them reach the necessary level of studies, *"they participate in a pre-preparatory program (pre-*

Photo: Yossi Cohen

Matan Nutzki

Special programs

mechina), where they learn English and Math from the most basic level to that of an eighth grader. They then continue to the pre-academic preparatory one year program (mechina), at the end of which they must successfully complete a mathematics matriculation exam." says **Vardit Markowitz**, Director of the Pre-Academic Preparatory Programs (Mechina).

Regarding the potential issues that could arise when having to treat women, sometimes in highly intimate situations, JCT officials actually believe that this is not a major hurdle. **Professor Chaya Greenberger**, Dean of the Faculty of Health and Life Sciences at JCT, states: *"Everyone understands they must undergo clinical practicums and treat women, but this has the backing of rabbis and halachic authorities,"* she says. *"Some of our students have already helped women deliver babies as part of their volunteer work for MDA."*

Regarding treating women, **Dr. Shoshi Riba**, National Chief Nurse and Head of the Nursing Administration in the Ministry of Health, says that the system is flexible. *"The students receive no exemptions; eventually they all undergo the same licensing exams and receive the same diploma [as any other nursing students]. The only concession I agreed to was to enable the haredi students to learn obstetrics using sophisticated simulators."* This method is very close to life and allows the students to hone their skills without having to compromise their beliefs.

Nursing Simulation Laboratory at JCT

JCT Receives Approval to Open Pre-Medicine Program

JCT received approval from the Council of Higher Education to open a specialized program in Pre-Medicine in the Bioinformatics Department of the Health and Life Sciences Faculty. This program includes core medical courses in addition to social sciences and research courses. Upon completion of the degree, graduates will be prepared for employment in hi-tech, particularly in companies dealing with programming and computerized design of medications, as well as in the field of bioinformatics. Students will also be eligible to continue their studies towards a medical degree. *"In many ways this is the best track for studying medicine, as it provides students with a wide range of employment opportunities,"* explains **Dr. Sarah Ganot**, Academic Head of Tal Campus at JCT. *"The regular track towards a medical degree is a seven year program, and it is nearly impossible to discontinue studies before completing the degree, and a great deal of time is invested. In contrast, after three years in the Pre-Medicine program in the Bioinformatics department, students receive a Bachelor's degree and can take their time to consider whether they want to continue. Whoever wishes to continue towards a degree in medicine can do so, but those who do not wish to continue also have the option of immediately entering the workforce with a profession."*

Campus updates

New Dormitories for Married Couples and Renovated Bet Midrash

This summer, JCT opened its beautiful new dormitories for married students. This is the first time JCT is able to offer housing facilities to married couples. The dorms house 56 couples and their families. JCT is planning an additional new dormitory building, and construction will begin in the coming year, to help alleviate the dire shortage of affordable housing for young students in Jerusalem.

The Bet Midrash is currently undergoing extensive renovations and is to be named Hechal Victoria in memory of **Victoria Natan**, wife of **Rachamim Natan** and aunt of **Admon** and **Edward Cohen**.

Yehuda Leib Golomb Annual Lecture

The twelfth **Yehuda Leib Golomb** Annual Lecture on Applied Mathematics, in memory of **Rav Elchanan Tzvi ben Reb Yehuda Lev Ha-Cohen Golomb**, was held in June at JCT's Lev Campus.

This year's lecture was entitled *"The Coming Revolution in Synthetic Biology"* and was given by **Joseph Jacobson (PhD)**, who is an associate professor at the Massachusetts Institute of Technology (MIT) - where he leads the Molecular Machine Group which focuses on synthetic biology. He is also co-founder of E Ink and the Gen9 Corporation and founding director of One Laptop Per Child (OLPC).

During his lecture, Dr. Jacobson explained that *"similar to the way in which we use software to program microprocessors to create new apps, the new field of synthetic biology offers the prospect of re-programming biological organisms to enable a wide range of new applications from reprogrammed micro-organisms to make new chemicals, food and pharmaceuticals, to entirely new organisms running new genetic codes to reprogramming our own genomes."*

As an outstanding scholar in his field and a regular learner of Torah in the Kollel of Greater Boston and the ELC Kollel in Jerusalem, Dr. Jacobson exemplifies the combination of leading academic achievement and regular Torah learning, which JCT encourages. It is for that reason that JCT was proud to have Dr. Joseph Jacobson as the speaker of this event.

JCT Gives Back to Its Soldiers

Earlier this year, a ceremony at the Lev campus honored 150 of our students who served, mostly in combat units, during Operation Tzuk Eitan (Protective Edge). Each student received a certificate of appreciation and a gift of NIS 1,000.

Prof. Chaim Sukenik, President of JCT, spoke at the event and praised their bravery and selflessness. In addition, a young officer, speaking on behalf of the students, shared some of his thoughts and those of his fellow 500 soldiers. His inspiring words reflected a level of dedication, commitment and national pride which touched everyone who was present. JCT is deeply indebted to and extremely proud of all these exceptional young men.

Campus updates

New Prestigious Laboratories for JCT's Electro-Optics Faculty

The Department of Electro-Optics recently upgraded its laboratories, which will significantly improve the research and teaching capabilities at JCT. In July, the dedication of the Maurice and Vivienne Wohl Electro-Optics Centre, including the Electro-Optics Laboratories and the Wohl Auditorium, was held in the presence of the trustees of the **Maurice and Vivienne Wohl Philanthropic Foundation.** The trustees, **Sir Ian Gainsford, Martin Paisner, Prof. David Latchman** and **Daniel Dover** together with their Israel representative, **Michal Herzog**, were given a tour of the laboratories by the head of the department, **Rabbi Dr. Avi Karsenty** including a demonstration by electro-optics student, Yeshurun Levy. They also met the Wohl scholars from the Education for Ethiopians program and the Tvuna program for Chassidic women at JCT who have received generous scholarships from the foundation.

Michal Herzog, Sir Ian Gainsford, Martin Paisner, Yeshurun Levy, Prof. David Latchman and Daniel Dover

JCT Hosts Physics Olympics

The finals for the Physics Olympics for Religious High Schools were held earlier this year at JCT with the participation of students (45 boys and 18 girls) from across Israel.

As part of the competition, contestants attended lectures, visited JCT labs and enjoyed fascinating demos of physics experiments. First prizes went to **David Rimon** from Yeshivat Torah U'Mada, adjacent to JCT, and **Noa Winer** from Ulpanat Ofra, who received scholarships to study at JCT.

Jerusalem Science Contest Winners Visit JCT

The finals of the annual Jerusalem Science Contest were held in March, sponsored by the **Walder Science Center** in Chicago in partnership with JCT. Thirty high school juniors and seniors from across North America took part in the competition, which focused on Agriculture Science and Jewish agricultural law, in recognition of this year's *Shmita* (Sabbatical) year in Israel.

Dr. Joshua D. Klein, senior researcher, Department of Jewish Law in Agriculture, Ministry of Agriculture of the State of Israel, was guest speaker at the event. The top prize went to **Nechama Dembitzer**, who won $1,000 and a four-year tuition scholarship to Tal. **Aharon Goldblatt** took second place and won $700. The finalists received a week-long trip to Israel, during which they visited JCT's Lev and Tal Campuses.

Mathematics Education Conference at JCT

More than 150 scientists and educators participated in the Mathematics Education Researchers' Conference at the Jerusalem College of Technology. The two day conference dealt with issues related to educational methods in Israel and around the world which incorporate mathematics. **Professor Noah Dana-Picard**, President Emeritus of JCT, remarked: "This conference provided a place for researchers to present their research and developments, both in education and technology, and has strengthened their sense of belonging to the research community."

Professor Dana-Picard added, *"JCT has a unique take in the field of Mathematical Education, since it trains engineers for hi-tech, which requires unique mathematical insights and skills with regard to algorithms and technology."*

Tal Campus Academic Head Sarah Ganot, Electro-optics Department Head Rabbi Dr. Avi Karsenty and Rector Prof. Kenneth Hochberg with the Physics Olympics prize winners

Congratulations to Our New Graduates

"*Mazal Tov* to the 660 students – 296 men and 364 women – who received their bachelor's degrees and to the 75 students – 28 women and 47 men – who received their master's degrees this past academic year.

Among the graduates were eleven students from the Ethiopians for Education (EFE) program, 245 haredi students (49 men and 196 women) and new immigrants from all over the world. "

Left to Right: *Prof. Chaya Greenberger, Dean of JCT's Faculty of Health and Life Sciences, Rachel, a graduate of the Education for Ethiopians program, and Prof. Kenneth Hochberg, Rector of JCT.*

Major-General (res.) Uzi Dayan addressing the Lev graduation ceremony

Women Graduates - Making Waves

In an article recently published in Haaretz**, Stuart Hershkowitz,** Vice President of JCT, stated, *"We must instill a love for science in the hearts and minds of young women, so that they may grow into the next generation of female scientists. Today, many do not view science as an attainable profession. In order for that to happen, we must train educators and create a specialized educational program. It is paramount to provide workshops and seminars in order to instill a new attitude towards scientific professions."*

JCT takes great pains to make that dream a reality. Over the past year, 364 women, including 102 *haredi* women, received degrees from JCT in the fields of Computer Science, Accounting & Information Systems, Business Management and Science and Technology Education.

Prof. Shulamit Levenberg, laboratory head in the Technion's Bio-Medical Engineering Faculty and an internationally acclaimed researcher in the field of fetal stem cells and engineered tissues, was guest of honor at this year's Tal Graduation. She praised the college's unique role, which enables religious women to study engineering in an environment suitable for them. She also stated that graduates of Tal have an impressive reputation in the industry.

Lustig MBA graduates

Rami Sartani, CIO of the Israeli Aerospace Industries (IAI), chose to focus on the female haredi graduates of JCT, mentioning his profound appreciation of those in his employment. He stated, *"We employ 14 haredi students and graduates from Lustig. They quickly learned the necessary skills and integrated into the workforce. Some of them already serve as project managers and are advancing the company with new technologies. They are currently leading software development for the IAI, which is responsible for the computerized systems of satellites and ships, as well as for the development and launching of aircraft."*

Students and Graduates

Graduates - Across the Industry

As part of a photography competition initiated by our Job Placement Department, 168 graduates submitted photos from their places of employment, including **Glide, Intel, NCR, Phoenix, Umoove, Amdocs, Elta, Bank of Israel, Deloitte, Hadassah Medical Center, Lumus, and Menorah.**

Strengthening ties with industry

JCT has always viewed its close ties with industry as an important part of its activities. We have placed an added emphasis in this regard and have hired a person in a newly created position to coordinate our efforts. The purpose is that through this interaction we prepare our graduates for cutting edge opportunities in industry. This is of huge importance in student placement and offers opportunities for joint research and student projects as well.

In the last year, JCT senior executives toured several hi-tech companies, including **Check Point, Texas Instruments** and **SanDisk**, in order to expand cooperation and observe how JCT graduates are progressing in their places of employment. **Shahar Bar Or**, CEO of SanDisk Israel, stated: *"After employing two Lustig graduates for nearly a year, they have proved themselves both in their ability to integrate and with their important contributions to the company."* At Texas Instruments Research and Development Center in Ra'anana, Lustig students are currently carrying out their final project, developing interfaces for wireless communication systems. According to **Rabbi Dr. Zvi Ilani**, Head of Lustig, this is a unique collaboration which enables haredi women to undertake the most sought after roles in the marketplace.

We have recently had visits from senior staff members of **Elta, Hewlett Packard and Lockheed Martin**. These ties are promoting the outstanding reputation that JCT has earned in industry. This is an exciting area which we look forward to developing further in the coming months and years.

Jerusalem College of Technology

Announcing the Publication in the Fall of the 24th Volume of

B'OR HA'TORAH

SCIENCE, LIFE AND ART IN LIGHT OF THE TORAH

Photo by Zev Rothkoff

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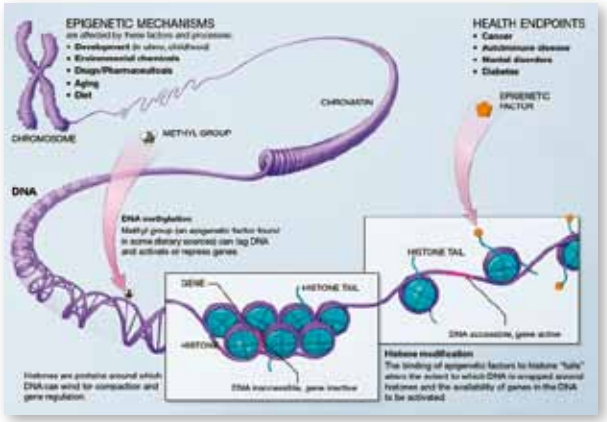
There is a registration fee only for the Shabbaton, not for the lecture sessions.

B'OR HA'TORAH

Volume 24 of B'Or Ha'Torah, Journal of Science, Life and Art in the Light of the Torah, is due to be published by the Jerusalem College of Technology this fall under the chief editorship of Professor Josef S.Bodenheimer, president emeritus of JCT, and the managing editorship of Ilana Attia, who has edited this prestigious journal for over 34 years. The upcoming volume will focus on the beginning and end of life: startling new technologies in need of timeless Torah values.

Below is an extract from Volume 23, written by Professor Marvin Gold, the discoverer of the enzymatic methylation of DNA in bacteria and bacterial viruses. Gold's discovery helped lead to our current understanding of epigenetics—how external factors can silence or activate certain segments of DNA without changing the genetic code but enabling far-reaching changes in personality, such as tshuvah (repentance).



The DNA in cells of most organisms is not all transcribed into messages. There are several reasons for this:

Not all DNA in a cell codes for genes; some genes (pseudogenes) cannot be expressed; some DNA sequences represent binding sites for other molecules; nearly all genes require start (promoter) and stop signals to which various molecules bind to allow for proper transcription.

There are also genes in certain stretches of DNA that are silenced. In paired chromosomes, one double helix is maternal and the other paternal and certain genes are normally transcribed from only one of these. If this situation changes, and genes are read from the other or both parents, serious biological consequences may arise, including some diseases.

This silencing is not a mutation in the DNA; rather it is because of something added onto the DNA, i.e., an *epigene*. This comes about via biochemical events, including DNA methylation in which an enzyme catalyzes the addition of methyl groups to the DNA cytosine bases in certain regions of the DNA. However, in addition, the chromosomal *histones* also play a role. DNA (acidic) in chromosomes is intimately entwined with basic proteins called histones, of which there are four. Some of the proteins are modified by enzymatic reactions which acetylate and methylate them, enabling them to bind to the methylated DNA region and to silence it. Now, since the DNA code stays the same after this, the process is called epigenetics (epi meaning "over" or "on top of").

It is unclear what triggers these reactions, but they must be controlled by the biochemical system called *signal transduction*. This is an extremely complex process consisting of hundreds of proteins, small molecules, metals, gases, hormones, and vitamins.

Very recent discoveries suggest that epigenetic modification might be hereditable, although most experts doubt that this can happen in mammals. Research into the effects of epigenetic changes during a mother's pregnancy is almost nonexistent. However, non-equivalent contributions of maternal and parental genomes during early plant embryogenesis have been observed.

The Talmud details the different contributions from each parent to a child, because this was the Creator's intent. Can human behavioral changes be ascribed to *epigenetics*? There is really no evidence for this. However, I refer you to Psalm 58:4 which states that evil people are evil from birth, even before in the womb. (See midrashim on Esau and Jacob.) Yet, the Creator has graciously enabled us to repent and improve.

Repentance and kindness do bring about true changes in behavior and possibly could be termed an "epigene" of sorts.

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The Jerusalem College of Technology was founded in 1969 and is today one of Israel's major academic institutions, with over 4500 students on three campuses. It is fully accredited by Israel's Council of Higher Education and specializes in hi-tech engineering, computers, business and health sciences. More than 100 hi-tech companies have been established by JCT alumni and faculty.

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