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TEAMS AND CONTRIBUTORS

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Jad Issa

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Paul Frangie

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Sana Bou Hamdan
Design Auditor

Anna-Maria Samaha
Team Member

Gaelle Maalouf
Team Member

Naheda Itani
Team Member

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Team Member

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EDITORS

Elie Tannoury
History

Dima Hijazi
Entrepreneurship

Malek Succar
Research & Innovation

Lyne Yamout
Initiatives & Events

Sandy Chehabeddine
Spotlight

Celine Dibo
Women in Engineering

Kelly Kenaan
Word from faculty

Michel Lamah
Into the future

STAFF WRITERS

Mohamad El Sheikh
History

Lara Al Hassanieh
History

Salam Tabet
History

Joseph Choefati
Entrepreneurship

Zeina Shatila
Entrepreneurship

Sabine El Baba
Entrepreneurship

Maroun Wakim
Research & Innovation

Anthony Torbey
Initiatives & Events

Mahmoud Mabsout
Initiatives & Events

**Adrien Khoury El
Aramouni**
Initiatives & Events

Jana Wehbe
Spotlight

Lynn Bazzi
Spotlight

Melanie Khalil
Women in Engineering

Pia Saade
Women in Engineering

Joseph Choefati
Word from faculty

Khalil Fayad
Word from faculty

Sarah Baalbaki
Into the future

As our time at AUB comes to an end, we cannot but look back with a sense of pride and a smile from ear to ear. Be it the learning experiences, the meaningful and lasting relationships with new people, the workshops and club activities organized, or the giving back to our community, we will fondly cherish our time and experiences at MSFEA. While prospects are grim and challenges demoralizing in light of the terrible time Lebanon is going through, saying that AUB and MSFEA have given up would be the furthest thing away from the truth.

Despite all catastrophes, students, faculty, and staff have gone above and beyond to make the faculty shine. MSFEA fostered innovation and endless lifelong learning whether it be through the Accelerator program, the entrepreneurship track, and cutting-edge facilities. Student-led initiatives took place in-person following the pandemic. Breakthroughs in research, inspirational faculty, staff, and women in engineering were all major milestones of this past year. During our four years here, we have witnessed countless dedicated individuals armed with an unwavering determination to make a difference shine with all their might. With such an abundance of talent tirelessly working for a better tomorrow, the need for a platform to share all these accomplishments presented itself. This is the true calling of Cogs and Caffeine.

This third issue is the fruit of dozens of dedicated students in the faculty, and we would like to thank, from the bottom of my heart, each one of them for their effort and contribution in making this vision come to life. They have built a bridge that joins the dreaming entrepreneur with the startup founder, the aspiring researcher with the patent holder, the old with the modern, but, most importantly, the impossible with the possible. Cogs & Caffeine is a testament to the beauty and splendor of MSFEA, a splendor that no ugly reality will ever tarnish.

We would also like to thank the MSFEA Communications Office led by Mrs. Mia Azar for their continuous guidance and help. Whether you're a writer, reader, or featured individual, we hope you will enjoy reading the stories in this magazine half as much as we enjoyed crafting them and make sure to keep the fire of MSFEA burning as bright as ever.

To many more issues to come!

Georges Haidar



Paul Frangie



Jad Issa



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SCHOOL OF DESIGN

GRAPHIC DESIGN AND ARCHITECTURE

FIRST YEAR

GRAPHIC DESIGN



AYA HAMDAN



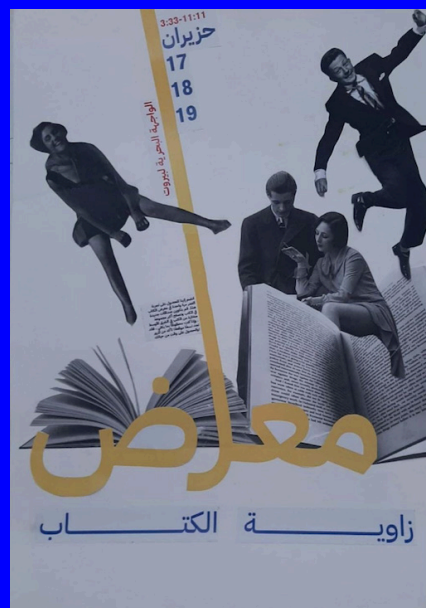
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EFFA ZANTOUT



NADIA FARES



ALAA AYAD



GAELE MALOUF



ZEINA HOUSSARI



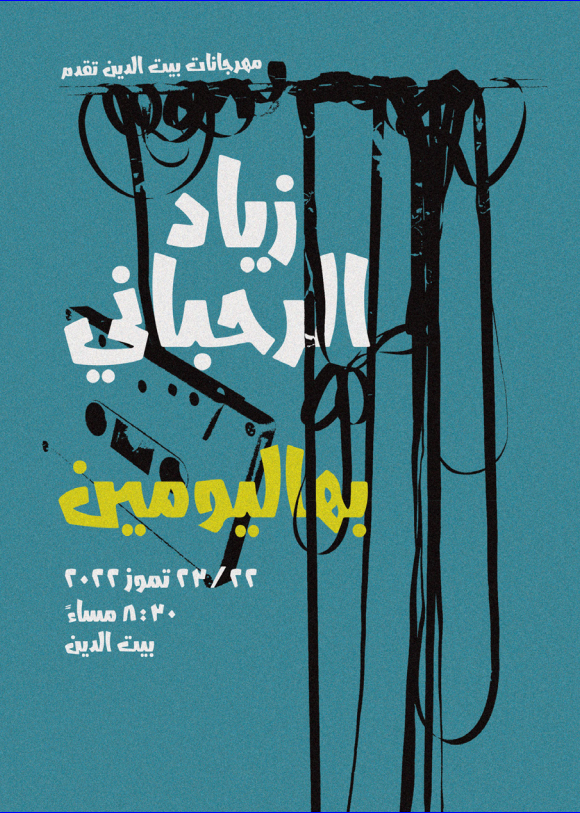
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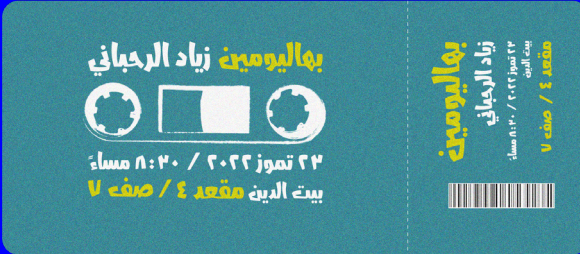
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LOULIA DAKER

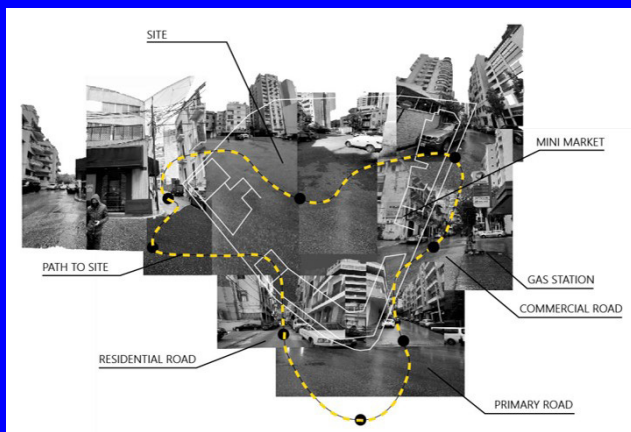
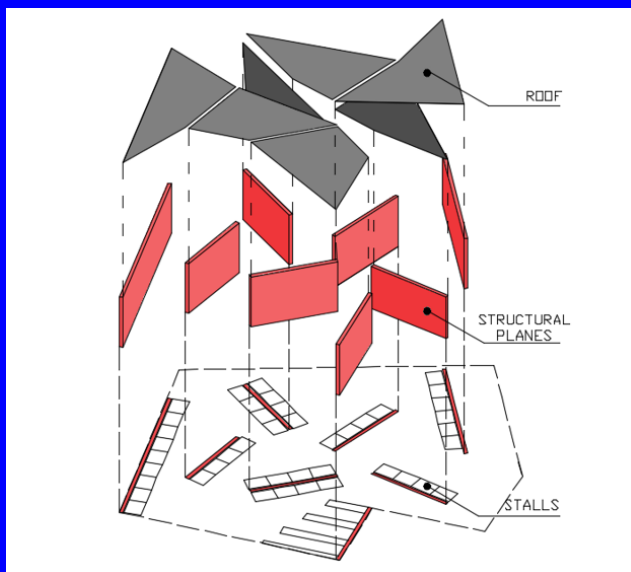
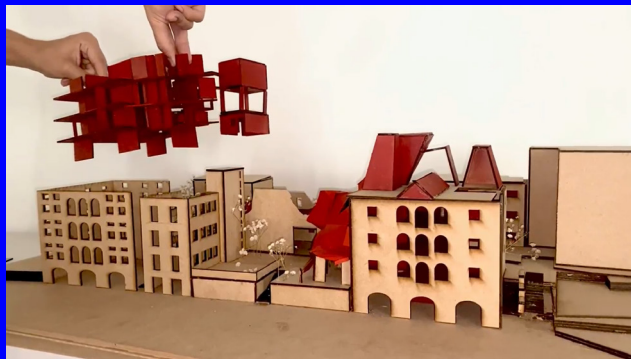


SANA BOU HAMDAN

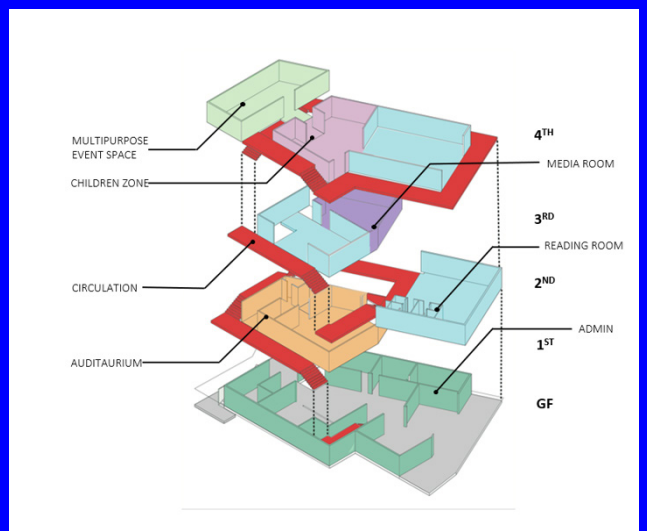
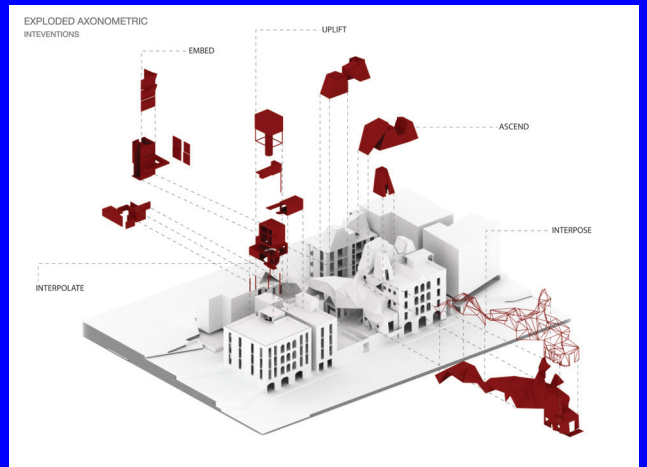


SECOND AND THIRD YEAR

ARCHITECTURE



RAMA ASSI, ZUHAIR EL HAK, DOUNIA EL KOJOK, FATIMA ABU AL NASR



ROWANA MAGED



HISTORY OF MSFEA

TIMELINE OF DEANS

WRITTEN BY SALAM TABET

C. Ken Weidner (1951-1963)

"The engineer has been, and is, a maker of history." — James Kip Finch, American engineer, and educator

That being said, one of the most noteworthy engineers in the history of AUB is C. Ken Weidner, a registered civil engineer, and the very first dean of The Faculty of Engineering and Architecture (FEA). Given his intimidating resume, circulating distinct positions from the Engineering Department of Boeing Aircraft Company, all the way to the U.S. Navy, it doesn't come as a surprise that so much was accomplished for FEA during his deanship.

As soon as the Arab World recognized the need for engineers in 1913, AUB, like always, was a pioneer in fulfilling the engineering educational needs, and a program leading to the degree of Bachelor of Arts in Engineering was established within the School of Arts and Sciences.

Initially, only Civil Engineering courses were offered and although it is hard to believe, the entire Department of Engineering back then was situated in a single room in Bliss Hall, room 108. By 1951, and under the Deanship of C. Ken Weidner, a separate School of Engineering was formed, and a new building funded by Stephen D. Bechtel was built to accommodate it. This building, which was named the Bechtel Engineering Building, after its donor, was inaugurated in a very special ceremony on April 1954, 16, under the auspices of his Excellency Mr. Camille N. Chamoun, President of the Lebanese Republic, and in the presence of Dr. Constantine Zurayk, Acting President of AUB, and Mr. Stephen Bechtel.

Generally, any building with weak foundations is prone to collapse at any moment. However, a building with sturdy foundations can develop and grow to become a skyscraper. In fact, the fundamental structure that Weidner designed for the faculty was so solidly built, that FEA went a long time without having to make substantial structural alterations. After extending the department to include civil engineering, mechanical engineering, electrical engineering, and architectural engineering, the established four-year curricula were thoroughly studied and completely transformed in 1954. The main aim of building intensive curricula was to produce top-notch professional engineers who can immediately commence their careers after graduation.

During Weidner's deanship, the dream of FEA became a reality, and engineering students surpassed all expectations with their outstanding academic performance. In appreciation of his services to education and the engineering profession in the Middle East, Dean Weidner was awarded by a Jordanian Royal decree the Jordanian Medal of Independence. It all started with an engineer who made history, then the legacy was passed on to many AUB engineering students who are still making history to this day.



"THE ENGINEER HAS BEEN, AND IS,
A MARKER OF HISTORY."

— JAMES KIP FINCH

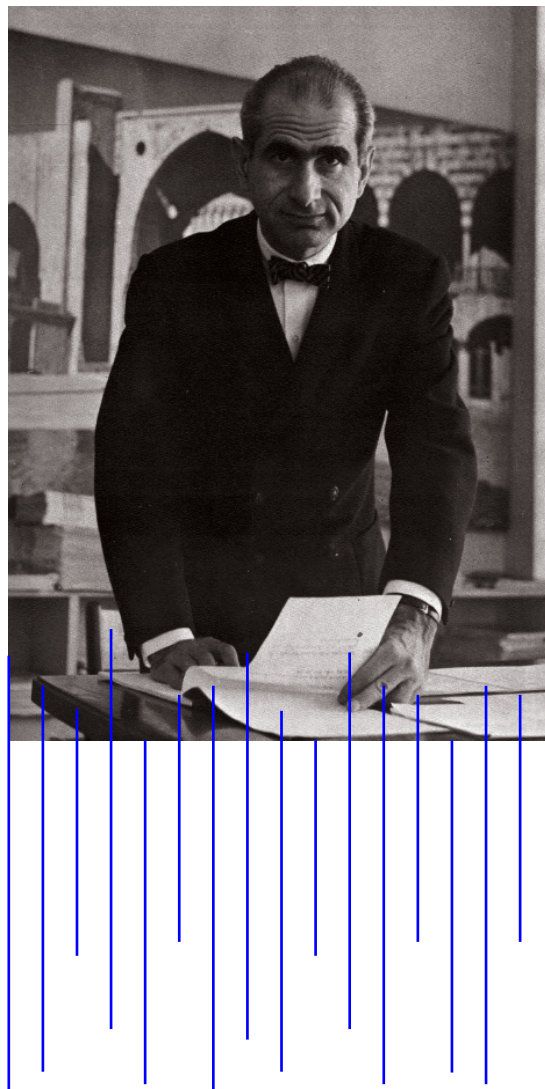


John B. Wilbur (Jan – May 1964)

With the beginning of the 1964 Spring semester, the School of Engineering welcomed its new dean, formerly professor of engineering and head of the Department of Civil and Sanitary Engineering at the Massachusetts Institute of Technology (MIT), Dr. John B. Wilbur. In the short time that he had served as Dean, he made a significant contribution to the School of Engineering and the University by providing leadership in both the routine functioning of the School and the creation of policy in the Ten Year Plan for that School. For he did not waste any time, and as soon as he was assigned as Dean, he began consulting with faculty members, meeting students, and inspecting the physical plant right away. In honor of his efforts, the Engineering Alumni of AUB held a dinner party to honor him on March 21, at the Bristol Hotel. The President accepted his resignation from the Dean position with great reluctance in May 1964.

Raymond S. Ghosn (1965 – 1976)

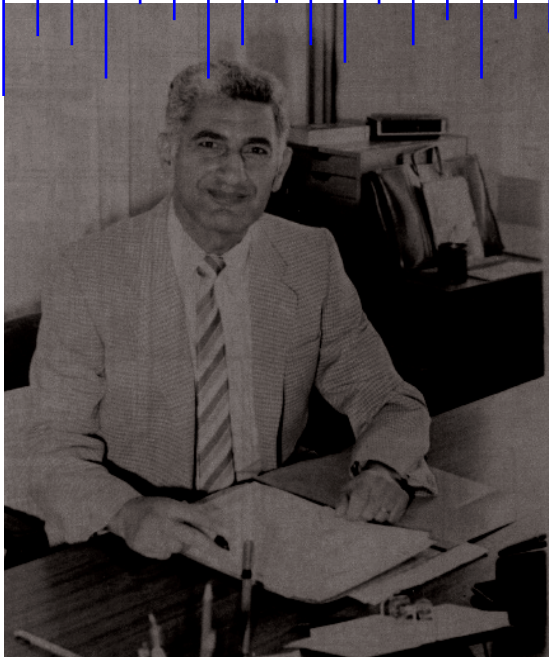
Have you ever stumbled across the Raymond Ghosn Building on AUB's lower campus? This engineering building, inaugurated in 2001, was dedicated to the late Raymond Ghosn, the Dean of MSFEA from 1965 to 1976. Dean Ghosn, who surprisingly was initially reluctant to accept his dean position, accomplished a lot for the faculty. The first milestone was a complete renovation of the Bachelor of Architectural Engineering program introducing a new program leading to the degree of Bachelor of Architecture. The new Architecture Program, with its 26 novel and redesigned courses, switched the emphasis from «how» to «why» inquiries, and for the first time, Lebanon was able to graduate engineering students who spoke the language of modern architecture. Maintaining the sturdy foundations of the faculty, Ghosn even renamed the Faculty of Engineering to the Faculty of Engineering and Architecture and further divided the faculty to comprise four departments: the Department of Architecture, and the Departments of Civil, Electrical, and Mechanical Engineering. Since then, constant revision and modifications of the curricula have been done on a regular basis. The milestones did not only include the faculty's organization and curricula aspects but also extended to include social aspects, where the Architecture Department admitted its first female student, Vassiliki Laios in 1967. For decades, the Department has pioneered unique, hybrid, and often controversial teaching methods that have made its program relevant to Lebanon and the region, as well as a model for others to study and replicate.





Kano Kanaan (1977 - 1982)

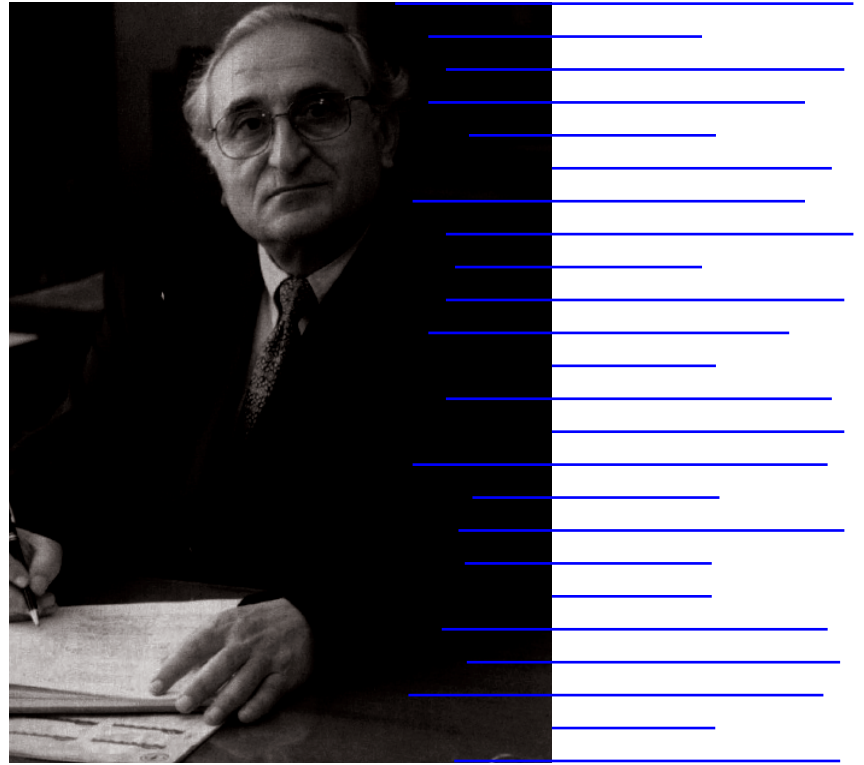
Dean Kano Kanaan, who succeeded Dean Ghosn, was reaped from AUB's existing reliable faculty, as he had a long history with AUB, starting as a teacher in 1954 and then being promoted all the way to a professor in 1969, after receiving his Ph.D. from Yale University. He was even the first chairman of the Electrical Engineering Department as soon as the Faculty of Engineering was reformed and split into Departments of Architecture, Civil, Electrical, and Mechanical Engineering. Dean Kanaan was a driving force behind the creation of the master's degree program as well as the faculty and student exchange program between AUB's Faculty of Engineering and Architecture and the University of Pittsburgh's School of Engineering in Pittsburgh, Pennsylvania. Gulf Oil Inc. provided a five-year commitment of \$500,000 to the program.



Henry Madany (1983 – 1985) - Acting Dean

"We make a living by what we get, but we make a life by what we give." – Winston Churchill
Henry Madany was appointed Acting Dean of the Faculty of Engineering in 1982. Not only did his dedication and effort greatly enhance the engineering programs at the university, but they further fostered AUB's professional ties with colleagues and institutions around the globe. Dean Madany paid visits to countless countries including the United States, England, and Bahrain, to either recruit top-notch reliable people for the Faculty, keep engineering programs up-to-date or modernize electrical laboratories' equipment and installations. He served the Faculty with unwavering commitment and allegiance until he became the Acting Chairman of the Electrical Engineering Department in 1985.

**"WE MAKE A LIVING BY WHAT WE GET,
BUT WE MAKE A LIFE BY WHAT WE GIVE."
– WINSTON CHURCHIL**



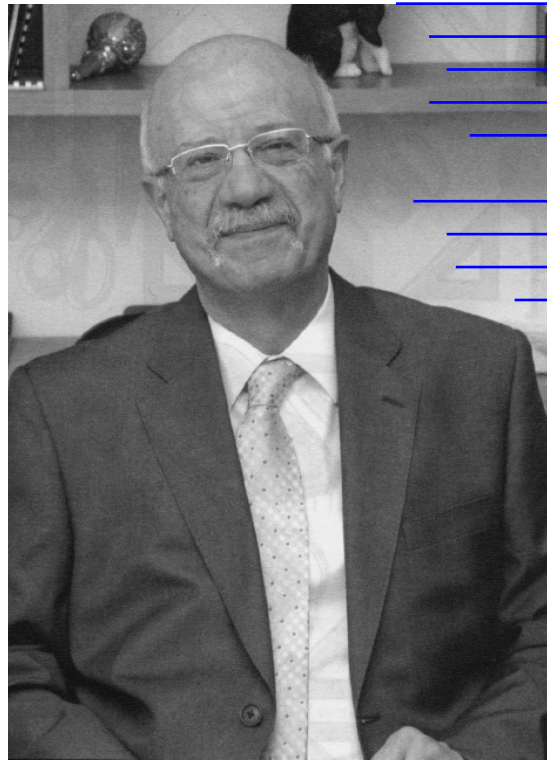
Nassir H. Sabah (1986 – 1999)

The chain of great MSFEA deans was continued by Dean Nassir H. Sabah, a professor of biomedical engineering, who succeeded Henry Madany in 1986. His brilliant mind, which produced over 100 technical publications, inflicted great improvement on the faculty's programs at the undergraduate and graduate levels. The Electrical Engineering Department introduced Computer and Communications Engineering in 1986, one of the most popular majors today. A novel four-year undergraduate Graphic Design program was launched in the Department of Architecture in 1992. A key milestone in the faculty was the introduction of a Master of Engineering degree program at the graduate level for each of the three engineering departments. In 1990, a new interdepartmental graduate program leading to the Master of Engineering Management degree was established. With his impressive history in research and innovation, he acknowledged every engineering researcher's dream and investigated the feasibility of launching an engineering Ph.D. program.

Ibrahim Hajj (2000 - 2010)

The rapid increase in the number of full-time faculty members (from 14 in 1952 to 49 in 2001) and the student numbers (from 100 undergraduate students in 1951 to about 1200 undergraduate and 150 graduate students in 2001) called for another powerful leader for the faculty. That leader was none other than Ibrahim Hajj, a Professor of Electrical and Computer Engineering and successor to Dean Sabah in 2000. Like any typical MSFEA dean, he did not disappoint, and his years of deanship imposed countless enhancements on the faculty. His contributions went beyond updating, renovating, and re-organizing the faculty's departments and curricula, to collecting valuable accreditations, funding, and grants, as well as forming research groups. Hajj strived to retain the faculty's national and regional leadership in teaching and research. That was evident in 2001 when all engineering curricula were redesigned to comply with the US Accreditation Board for Engineering and Technology (ABET). Furthermore, countless interdepartmental research groups that focused on various topics, like energy, information technology, and mechatronics were formed.

**“THE DEANSHIP OF HAJJ
WITNESSED A HECTIC
EXPLOSION OF ACTIVITIES
FOR THE ENGINEERING
FACULTY, WHICH GREW
TREMENDOUSLY AND
CLIMBED UP THE
INTERNATIONAL LADDER
OF RESEARCH AND
ACCREDITATION.”**



Makram Suidan (2011 - 2016)

Chosen for his vision, energy, and accomplishments, as well as his deeply embedded passion and conscience to make a difference for AUB students, professors, and staff, as well as the rest of the globe, Makram Suidan, succeeded Ibrahim Hajj as Dean for MSFEA in 2011. Under his five-year outstanding leadership, the Faculty of Engineering and Architecture has flourished and prospered. Several new initiatives in academic programs have been implemented, including the introduction of Industrial Engineering and Management, as well as Chemical and Petroleum Engineering, as distinct departments. Suidan is noted for upholding the highest academic standards and for creating, planning, and implementing ambitious plans to build cutting-edge educational and research facilities. His constructive vision was manifested through the renovation of the Bechtel Engineering Building and the construction of the Irani-Oxy Engineering Complex, which stands as a model of environmentally sustainable building. Dean Suidan and his exceptional team's efforts were not limited to concrete, steel, and glass. Expanded labs, teaching areas, conference and common rooms, lecture halls, and library facilities have been created to accommodate and support new undergraduate and graduate study opportunities. The Suidan years have been fruitful and thrilling ones in the history of FEA. His dedication, passion, scholarship, and ambitious vision have all had an ever-lasting positive influence on AUB.

Research funds, equating to hundreds of thousands of dollars, were raining in on the faculty from numerous institutions including LibanCell, Dar Al-Handassah, and ASHA. Faculty were further urged to make use of opportunities to attend international conferences, workshops, seminars, and short courses, as well as to spend the summer months rotating between universities in the United States and Europe. In 2001, a new facility dedicated to the late Dean Raymond Ghosn was built and inaugurated in the presence of AUB President John Waterbury and other dignitaries, under the auspices of Mr. Rafic Hariri, Prime Minister of Lebanon, represented by Mrs. Bahia Hariri, Member of Parliament. In short, the deanship of Hajj witnessed a hectic explosion of activities for the engineering faculty, which grew tremendously and climbed up the international ladder of research and accreditation.

Alan Shihadeh (2017-present)

Maintaining the highest standards for MSFEA deans, Dean Alan Shihadeh, an advisor to the FDA, a scientific expert to the WHO, and a Project Director and Executive Leadership Committee member of the Center for the Study of Tobacco Products at Virginia Commonwealth University, was appointed as Dean of MSFEA in 2017. As soon as he was appointed, Dean Shihadeh began making adjustments to make MSFEA a catalyst for revolutionary change that embraces innovation, entrepreneurship, pedagogy, and knowledge production. He consequently redesigned academic courses, put in place research agendas, and shifted objectives to reflect this new approach, a principle so elegantly mentioned in a FEA Graduate's Oath: "the obligation to use my special knowledge and expertise to serve humanity". Despite the pandemic and economic collapse of the country, MSFEA was able to pull through under Shihadeh's powerful leadership, who worked hard to secure large volumes of grants, funds, and opportunities for engineering students, including a partnership with Petrofac, who agreed to send 100 engineers to AUB's elite master's program.

**"TOWARDS A LIVABLE, VIABLE,
AND EQUITABLE WORLD."**

MSFEA wouldn't be the stellar faculty it is had it not been for the invaluable contributions of its successive Deans. While the future, in light of the uncertainty that the country is grappling with, does look grim, one must remember that night is darkest just before dawn and that we must keep moving towards a better world, an objective so elegantly put by Dean Shihadeh in his own words: "Towards a livable, viable, and equitable world."

MSFEA'S HISTORY

A DISCUSSION WITH
DR. NASSIR SABAH

WRITTEN BY LARA AL HASSANIEH



Anyone familiar with AUB or its Faculty of Engineering and Architecture has undoubtedly heard of Dr. Nassir Sabah, Professor in the Department of Electrical and Computer Engineering, which he joined in 1971, Dean of the Faculty from 1986 to 1999, author of four books and numerous research papers. Dr. Sabah built, and continues to build, an immense legacy. Over the last 50 years, he saw MSFEA go from a small faculty in war-torn Lebanon into one of the finest schools of engineering in the region. We had the pleasure to sit with Dr. Sabah to ask him questions about his journey, MSFEA, and what lies ahead:

1. After finishing your Ph.D. at the State University of New York at Buffalo, what made you come back to AUB, and why did you decide to start teaching here? How was your experience when you first started?

AUB has a special place in my heart. I joined International College (IC) in Beirut when I was 9 years old as a boarding student, so I have a very long association with the university. Since IC was a part of AUB, and it was just a high school at the time, it was automatic to go from IC into freshman. I spent my freshman and sophomore years at AUB as that was the necessary process to obtain a certificate that is equivalent to a baccalaureate degree at the time. After finishing my Master's degree from the University of Birmingham, I tried working in the industry for a couple of years, however, I didn't like it. And so, I decided to go into academia and pursue a Ph.D. I didn't want to live abroad, so I returned to AUB.

2. Since you were dean during the period that CCE was first introduced as an undergraduate major in 1986, can you tell us a little about what was envisioned for the program back then, and how it compares to where it is at today?

In the early 1980s, the university wanted to introduce computers into academia. So, they formed an interfaculty committee, and I was one of the representatives from MSFEA. The first major envisioned was computer studies, which integrated both software and hardware since their division appeared artificial from an academic view. An Institute for Computer Studies was established in 1984, and I was appointed Director. The Institute was under the jurisdiction of the Vice President for Academic Affairs, and the engineering Faculty housed it. In 1986, the Institute of Computer Studies was terminated as the program was unheard of in the United States. Instead, computer science was established in the Faculty of Arts and Sciences and Computer Engineering in the Faculty of Engineering, much like in American universities. In January of the same year, I was appointed Dean of the Faculty of Engineering and Architecture.

At the time, we envisioned integrating communications with computers. Hence, the vision of the Faculty changed. Instead of being eliminated, the original computer studies program was basically extended by a year into a five-year curriculum (as per engineering requirements) to include communications and renamed «Computer and Communications Engineering» (CCE). At the time, there was no Computer and Communications Engineering program anywhere else in the world. «I've always believed that we shouldn't try to imitate anyone else; instead, we should think about what's best for us.»

3. Since you have witnessed a very big part of MSFEA's history, how would you describe its evolution throughout the years?

Since its inception, AUB was always regarded as the American University of Beirut, not the American University in Beirut, meaning that AUB adapted the American model to local circumstances and culture. Since MSFEA was inaugurated in the 1950s, it has evolved continuously in terms of curricula and course content to keep up with technology. The evolution, however, did not mean more difficulty. In fact, many courses were made much less difficult. But the major reorientation happened around the year 2000. Within these two completely different eras, a gradual evolution was occurring.

4. What event, or number of events, do you consider essential for MSFEA to be where it is today?

From the 1950s till around the year 2000, undergraduate admissions were in the hands of the Faculty and strictly based on academic merit, striving to achieve the highest academic standards. There was a year-based block program instead of the current credit system and students were only allowed a choice of electives in their final year. Any student with an average of 50 or less in the first semester was dropped from the faculty, disallowing them from ever reapplying. Then, a university-wide change began in the year 2000. Undergraduate admissions were taken out of the hands of the Faculties and assigned to a central Admissions Office. The aim of the Admissions Office was not exclusively academic ability, but student diversity, as in the US. And once you adopt these kinds of admission criteria, this naturally affects academic standards.

5. Do you think that the experience that students have at AUB today is different from that of the students during your early years in the Faculty? If so, what do you think is something that is missing from student life today compared to back then?

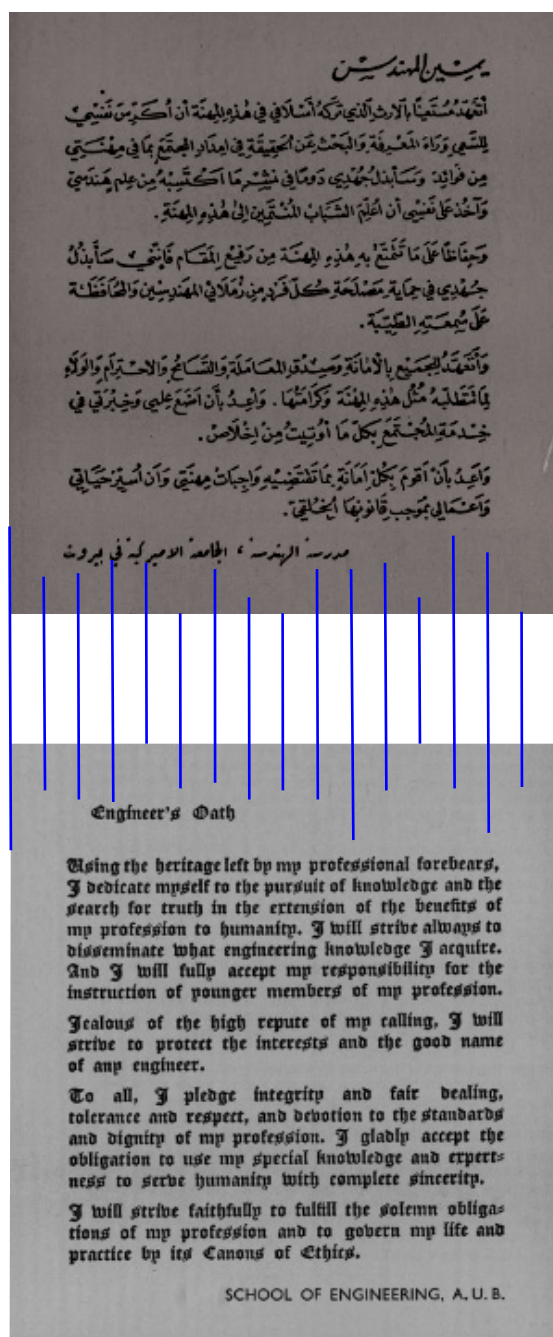
As AUB became more American-like, the whole atmosphere changed along with students' attitudes. Before, students were much more disciplined because of the tough academic regulations. Now that this has changed, there's a perceptible difference in most students' attitudes. Most students, I'm sorry to say, are here just to obtain a degree, not to learn. There are still some who are interested in learning as much as they can but they're a very small minority, unfortunately.

6. How did AUB adapt across all the different hard episodes Lebanon went through from the civil war to the different economic downturns?

I joined the university in 1971, so I was present during the troubles of the 70s and the 80s. It was felt very much by the university and reflected, first, in the student body. When there was a division between East and West Beirut, AUB had to establish a branch in East Beirut, so we didn't get students from there on campus. The students who came to West Beirut came from specific geographical areas. The whole country was divided, so the composition and character of the student body changed. The composition of the faculty was not the usual mix as well. Recruiting full-time faculty was very difficult, there was a substantial number of part-timers carrying out most of the program. **Strangely enough, economics was not felt very much at the time as it is now.** For one, the banks operated normally, it was only the value of the lira that kept deteriorating. There were economic hardships, it was felt by everybody like it is now. However, now we're also suffering from a substantial number of faculty on leave, very few have resigned from the Faculty so far. And unless the university comes up with a viable solution it will be a major problem. And of course, the solution will have to deal with the financial aspect, with pay. **The lira has devalued almost 15 times, that's a major factor.**

7. Do you have any stories or memories, from your time at the faculty, that you are very fond of and would like to share with us?

There used to be two events that generated a great deal of excitement. One was the annual football game between the Engineering and Arts and Sciences Faculties. Students would begin preparing at least a week before the event. The red tarboosh was the engineering symbol, and it was worn during the event. The game generated a great deal of excitement, especially on the day of the event. Another exciting event, although not long-lasting, is the administration of the Engineer's Oath at graduation. Before the students started to receive their degrees, everyone stood up, and the Oath was read to them, and **all 200 of them would say «I do» in one voice.**



8. What do you imagine MSFEA will look like in future years, especially with plans of developing twin campuses outside of Lebanon?

It is hard to answer this question, as it depends on many factors. First, it depends on the intention of going regional. I feel that the trend in AUB, especially since the year 2000, is that more emphasis will be on liberal arts education, consequently deemphasizing technologically-oriented education. AUB started as a liberal arts college with a School of Medicine. The Faculty of Engineering and Agriculture was added much later. As a result, **there has always been a strong tradition of liberal arts education.** This emphasis was a university policy from the Board of Trustees. Another factor to consider is that Lebanon is no longer booming industrially and construction-wise as it was before. There is not much industry to speak of in Lebanon and the region. It's always in countries that are heavily industrialized that you see a high demand for STEM graduates. For example, China and Russia, where their economies are still based on production. **Most AUB graduates eventually travel abroad.** Liberal education is more felt in the curriculum, which may be a good thing as far as the students are concerned. As far as the Faculty is concerned, however, it's hard to say because it depends on how the other Faculties are doing. **«There will always be a demand for good engineers, but where that is the question.»**

9. Finally, what is a piece of advice that you take by heart, that you would like to share with us?

Students should really think hard about what they want to do in life. This is a very basic question that every person has their own answer to. What is it that you are really after? Are you after money? Prestige? Success academically or professionally? Or Do you want to improve as a human being? **I always urge students to think wvery hard about this question and to act accordingly.**

THE EVOLUTION OF THE ECE CURRICULUM

AN INTERVIEW WITH
DR. AYMAN KAYSSI

WRITTEN BY MOHAMAD EL SHEIKH



From a small school enrolling tens of students to the renowned faculty from which hundreds of engineers, architects, and designers graduate each year, the Maroun Semaan Faculty of Engineering and Architecture has grown significantly over the past century. This growth required drastic changes at times, including an evolution of teaching methods and material, to accommodate for the advancements in technology and developments in the engineering disciplines. Perhaps the most affected major by these transformations was the Electrical and Computer Engineering major, or ECE for short, whose curriculum saw fundamental changes and restructuring over the past 40 years.

An electrical engineering curriculum has been present at the university ever since a separate school of engineering was first established in 1951. Later, when this school was transformed into the Faculty of Engineering and Architecture in 1966, the Department of Electrical Engineering, which is currently known as the Department of Electrical and Computer Engineering, was among its first and most prominent components. It offered a high-quality technical education in traditional electrical engineering that attracted the brightest minds from the region. But soon after, the field of electrical engineering, and the world as a whole, would be experiencing an unprecedented technological boom: **the digital revolution**.

Starting with the 1970s, a shift from mechanical and analog electrical systems to digital electronics was occurring. The 1980s were particularly fruitful, as digital computers began creeping their way into businesses, schools, and homes. Over the next years, these advancements took over and completely changed every aspect of human life and industry, culminating in the Information Age, and thus revamping the required knowledge to work in the field of electrical engineering. In the face of such significant transformation, the EE education at AUB had to adapt to remain leading and relevant.

We wanted to get a taste of what this exciting phase in the history of ECE education was like. And who would be better to ask than someone who experienced it first-hand, both as a student and as an educator. With that considered, we decided to talk to Dr. Ayman Kayssi, a professor at the ECE department. From 1983 to 1987, he was an undergraduate student of EE, the precursor of the modern ECE major. He then received a PhD from the University of Michigan before returning to AUB in 1993 as a professor. Since then, he has taken many notable roles including chairperson of the department, and currently teaches courses on a variety of subjects from electronics to networking and security. He is looked up to from students for providing valuable advice, so we knew that he would be the right person to ask for insight on this subject.

The 80s

Our first question was about the educational experience as a student at AUB during that time. Dr. Kayssi began by sharing how his experience was affected by the civil war and the challenges it posed. He noted that, while 1983 was relatively peaceful, the “intifada” of 1984 soon after led to a reduction in the diversity of students at AUB, as well as a decrease in the number of faculty members. “However, that doesn’t mean that the experience was negative. We learned a lot. It was a good experience overall, and the AUB experience in general is consistently good.” He continued by describing how the learning experience was like academically and comparing it to that of the current days. One difference he noted was in some of the material taught in the courses: for instance, they had three main electronics courses instead of the current two, covering mostly the same devices still taught today such as diodes, BJTs, and amplifiers, but not emphasizing MOSFETs unlike modern electronics courses. The other major difference he discussed was concerning digital courses. He stated that he did not learn most of what is being taught in digital courses nowadays, nor is what he learned in these courses still taught today.

“Digital changed a lot. Digital was what really caused the Information Revolution.”

More prominent than the changes in material were the changes in the structure of curriculum. “The overall curriculum was very different,” Dr. Kayssi explained. “The first two years in engineering were common to all engineering students. In the first two years, we didn’t have majors.” Apparently, students were divided between different sections, and in one, mechanical, electrical, and civil engineering students would take statics, dynamics, and circuits courses from each respective department together, in addition to the other common courses like mathematics. Students could only focus on their major starting from their third year. He remarked that while some of the courses he had to take did not end up being too useful for him, this style of curriculum allowed him to make friends and connections in different departments, something that has become harder these days. But what was more surprising was that there were no elective courses. “All the courses in the first three years were set.” Students were required to take specific courses not only from their field of study but also from the humanities and sciences during specific “terms” (what the semesters were known as back then) to

be able to progress further in their studies. He described this style of curriculum as a “block program” with very limited options for variation. Limited electives were available; for example, EE students had a single choice between a microwave engineering course and a renewable energy course in the fourth year.

A notable change did occur towards the end of Dr. Kayssi’s undergraduate journey, however. In 1986, the Computer and Communications Engineering major (CCE) was introduced. Before that, most computer-related courses were initially taught within the mathematics department of the Faculty of Arts and Sciences, with some hardware related ones taught in EE. Then FEA Dean Nassir Sabah decided to establish an Institute for Computer Studies (ICS) with the purpose of teaching these courses and pushing forward computer education. The ICS greatly interested Dr. Kayssi, but he was not the only person to fall in love with this novelty. Students interested in studying computers who used to be forced to study EE moved to ICS, and it quickly became the main computer program at AUB. With the newfound and massive popularity of this computer program, the university administration opted to split ICS into two: a computer science program within the FAS and a computer engineering program within the FEA. The latter was called Computer and Communications Engineering.

“That turned out to be a very, very important decision,” Dr. Kayssi said on the naming of the major. “There was nothing like that at the time.” He explained that such an innovative computer and communications engineering program did not exist even at the universities with top electrical engineering and computer engineering programs, and that it came to AUB at just the right time: the rise of digital computers and communications. The program was an instant success, attracting all those interested in computers or communications technology, and soon became FEA’s flagship program.

But this shining popularity did come with a drawback: it stole the lights from electrical engineering. CCE became the major sought after by computer and communications enthusiasts, so what was left for EE was only traditional electrical engineering subjects, such as electronics, power, and control. **Quickly, CCE became more popular, outgrowing the less attractive classical EE.**

The 90s

We then talked about Dr. Kayssi's return to AUB as a professor in 1993. Since he graduated, the first two years of engineering had become major specific. He told us that in 1994, the department made a proposal with the goal of making EE general again. To do that, a major overhaul of the curriculum was required: the block system was discontinued in favor of a very flexible curricular system, opening the curriculum in a non-traditional way. But he said that they might have overcorrected, going to the other extreme. Students were left to make all the decisions, with the choice of taking whatever courses they want in the last two years. Students could take elective courses in whichever areas interested them, and while some requirements like the Final Year Project and General Education courses remained, the curriculum became really open in regard to the major and technical courses.

Dr. Kayssi pointed out some of the unwanted effects of this change. "The side effect was that you could specialize in an area," by heavily focusing on particular courses, thus acquiring knowledge to "become almost equivalent to someone with a master's degree in the area before you even graduate." On the other hand, another interesting side effect was observed. "When the curriculum became too open, many students opted for the easy way out." Since students were allowed to take any courses they wanted, many selected the easiest ones they could take to graduate even if these courses did not provide them with the foundations the students needed.

The department did some more changes in the late 90s that allowed for somewhat of the return to some restrictions. There were certain required courses for each year, so students could not progress from E2 to E3 without passing some fundamental courses for instance. And while there was a struggle with teaching the new, rapidly emerging knowledge of digital courses in the 80s due to limitations caused by the Civil War, the department worked afterwards to ensure that students were aware of and prepared with the latest information about technological advancements, to allow them to pursue their plans and goals whether in graduate school or in industry.

The 2000s

Eventually, in the early 2000s, further modification occurred with the aim of rebalancing the style of curriculum somewhere between the two previous styles. Students had the option of taking whichever courses whenever they wanted to, but there was a recommended curriculum acting as a guideline for a smooth learning experience. Students could follow it exactly, reshuffle some courses around, or disregard it completely with no penalty as long as the program's requirements were fulfilled.

Additionally, in 2003, the department rebranded as the Electrical and Computer Engineering department to reflect the inclusion of both the CCE and EE program within it. The EE degree itself was renamed to ECE in 2006. The philosophy behind these changes was to reclassify ECE as the general BE program offered by the ECE department, while CCE became the "special case" of ECE.

However, confusion soon arose about the identity of ECE. CCE seemed to have a specific focus, and students knew what to expect from the program, while ECE lacked this sense of identity. To address this issue, focus areas were introduced. With that, there was no longer a general program and a special program but rather different areas for each, consequently making the choice of major depend on the choice of area. Students wanting to study power fundamentals or control systems would major in ECE, while those that prefer to focus on communication systems or software would choose CCE. Hardware, as well as the upcoming electromagnetics and radio-frequency area, remained common between the two majors. That, along with the establishment of the Computer Science Engineering major (CSE), still caused some misunderstanding, which is why Dr. Kayssi likes to explain the distinction as follows: "CSE is basically software, CCE is communications, hardware, and some software, and ECE is everything else."

A Peek into the Future

Recently, due to the lockdowns and restrictions caused by the Covid19- pandemic, innovative solutions were required to overcome the problems pertaining to the lack of physical contact, and online learning was adopted. While it posed its own unique challenges, online education appeared to have some advantages over traditional learning, including ease of access, lecture recordings available to be watched and rewatched at any time, and accommodation for a larger number of students. Moving forward, one can expect to see more online and “hybrid learning” courses, a change that will allow students and instructors to benefit from the convenience of online learning while maintaining the necessary hands-on experience on-campus. We might already be witnessing this transformation, with some ECE courses, such as EECE 230, having now implemented a full-fledged online experience. Our final question to Dr. Kayssi was concerning what else he hoped would change about the curriculum in the coming years.

He stated that the department tries to change things every few years, but that there are some basic foundations that should remain, and some constraints that are present due to the General Education, ABET accreditation, and governmental requirements. “All of these need to be taken into consideration. Then you should consider your objectives: what do you want out of this curriculum?”

“Maybe something we should do right now is to look at the state of affairs around us. Things have changed a lot. Our students: what do they want out of their education? Why are they coming here and how can we help them achieve their goals? Maybe students will say: ‘we want to study electrical and computer engineering but all of us want to do consulting.’ Or: ‘we are all interested in graduate school,’ and so we can prepare them for advanced courses and research. Or they might want to stay in Lebanon. It could also be a combination: some want to stay, some want graduate school, some want consulting, and some want to work for industry in Europe and North America. So, what is happening now requires us to maybe think about the curriculum again: is this the best curriculum that AUB can offer with what is happening around us in Lebanon and in the region, and given the students’ goals?”

“WE CAN ALWAYS TRY TO **IMPROVE**, WHETHER [WITH RESPECT TO] COURSES OR CURRICULUM. AND THE **CURRICULUM** IS ALWAYS, **CONTINUOUSLY UNDER REVIEW**. IT REALLY IS LIKE A LIVING THING. IT **EVOLVES ALL THE TIME**.”

MSFEA THROUGH THE HISTORY BOOKS

SNAPSHOTS

JOINT EFFORT



The place assigned for our « Summer Surveying Practice» Baalchemay, is a small village near Bhamdoun



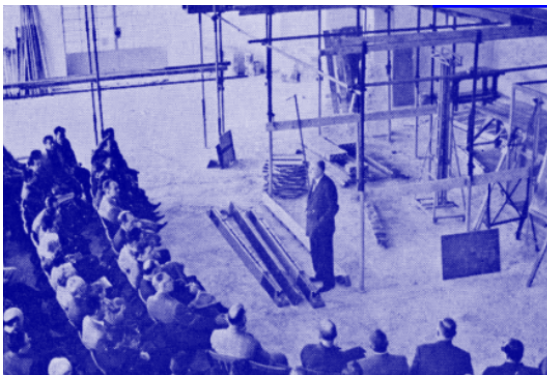
a meeting of the cabinet

(1952 yearbook)

« Apples, Surveying and Snakes »

«We were a group of sixteen students, some very tough, others not quite so tough, it seems, for they were camping for the first time in their lives. Our instructor, a teacher of Mathematics in the Prep School and a veteran of the Railway Engineers Corps, was surely the toughest for he shaved only twice during the whole month. The place assigned for our « Summer Surveying Practice» Baalchemay, is a small village near Bhamdoun. Shortly after our arrival, a rumor spread quickly all over the village that a group of engineers from the «Cadastre» was camping on the plot of land near the fountain. We soon began receiving guests many of whom came to inquire about the miserable fate of their property. Naturally, feeling a sense of authority for the first time, we did not tell them at first who we were. But as time went by their curiosity was satisfied, especially after the «gentlemanly» behavior of certain people. The fieldwork was done in the scorching heat of the day. Some

were lucky enough to be working in the thorny shrubbery on the rocky hilltops in the neighborhood of some hospitable villagers who offered them a cup of coffee or whatnot. Others were somewhat unfortunate to find a couple of snakes eager to join their group, possibly to help them out in their surveying work, poor little creatures! Their heads were soon chopped off by two «**professional snake hunters.**» Many of us, including someone who was constantly obsessed with the idea of snakes and such dangerous creatures, marched in the processional funeral arranged according to the traditional rites and under the direction of the Victorious Killers.»



Dr. V. O. Knudsen, renowned physicist, stopped for a few days in Beirut on his way to India last December - thanks to Beirut's International Airport. The A.U.B. seized this valuable opportunity and asked the world-famed scientist to lecture at West Hall.

(1953 yearbook)



The Engineering Society started a new type of activity this year, Sunday afternoon tea parties.

(1954 yearbook)



Saturday dances

« Lecture Series »

“Dr. V. O. Knudsen, a renowned physicist, stopped for a few days in Beirut on his way to India last December - thanks to Beirut's International Airport. The A.U.B. seized this valuable opportunity and asked the world-famed scientist to lecture at West Hall. On December 1st, Dr. Knudsen lectured, in West Hall's Societies Room, to an audience made up mostly of engineering students. The lecture was sponsored by the Physics Department, and Dr. Knudsen was introduced by the head of that Department, Dr. Salwa Nassar. The lecture was on acoustics and the application of acoustical design in various types of auditoriums, theaters, and classrooms. During the question period of the lecture, Dr. Knudsen was asked what should be done with West Hall to ameliorate its bad acoustics. Dr. Knudsen's answer was a classic.. **«Seat the audience under the drapes of the stage and give the performers the orchestra seats.»** Sunday, 18 January 1953, in the Engineering Laboratories, A CROW Ltd., of London presented to the Engineering School approximately £ 1000 worth of equipment. Present at this ceremony were members of the Engineers Union, faculty and staff members, representatives of the press, members of the Beirut Municipality, Lebanese Ministry of Public Works, Syrian Director General of Public Works, and Syrian faculty members - together with other interested engineers.

This was the first such ceremony to take place in the as yet undedicated Engineering Building. Acting A.U.B. President Constantine Zurayk opened the proceedings and Mr. Harry C. Stebbins, General Manager of the ACROW Export Division made the presentation to Dean C. Ken Weidner. Mr. Stebbins said that he had known and dealt with Dean Weidner before the Dean came to A.U.B. and that it was due to this association that the present gift materialized.

An on-the-spot demonstration of the practical use of the equipment followed. A model of metal forms for concrete slabs had been set up with props, shores, and adjustable steel floor centers. The whole operation was timed to demonstrate the overall efficiency of the system. This proved to be very interesting, inviting many questions and much discussion.

In the afternoons, while we were busy arguing with all sorts of figures and formulae in a desperate trial (at first) to draw up a plan of the district concerned, we were often surprised by the unexpected check-ups of our «Old Boss». Professor Osborn was a charitable person with a pleasing sense of humor and a rather strict sense of discipline. He brought us fruits and biscuits, cracked a lot of funny jokes while drinking a «cup of hot coffee» and administered a shower of stinging words and cold water upon those whom he found sleeping.

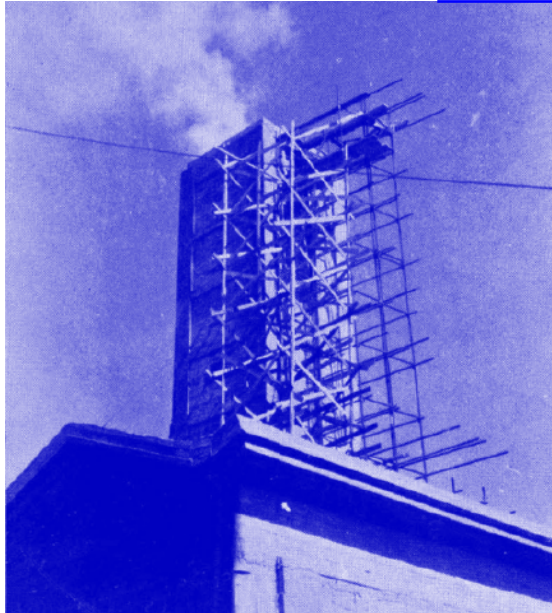
«The Greenhouse,» which was quite a long walk from the camp, was the hotel where we had our meals. It was renowned, it seems, for its «exquisite cuisine», but we were served quite often with the same course (squash to be precise). As to the dessert, it was not exquisite at all, nor was it very dependable. We had to find a way out, usually at the expense of the poor peasants' fruit trees in the neighborhood of the camp. Their grapes were still sour and their apples still green, but by comparison, they tasted as delicious as could be.

As a reward for our splendid achievement, for according to the faculty it was the best in years, we enjoyed an informal gathering provided by Prof. Manasseh who was responsible for the whole camp. With all that happened in Baalchemay our stay there was very pleasant and will always bring to us wherever we may be, **the sweet and pleasant memories of the good old days.** ”



(1955 yearbook)

Technical Trips



(1958 yearbook)

Engineering Power Plant



In the summer of 1958, the boys of the class of 59 (then fourth years) were trotting the globe from London to Kuwait, acquiring as the term goes 80 days (11 weeks) of practical experience before graduation.



Engineers Week

(1956 yearbook)

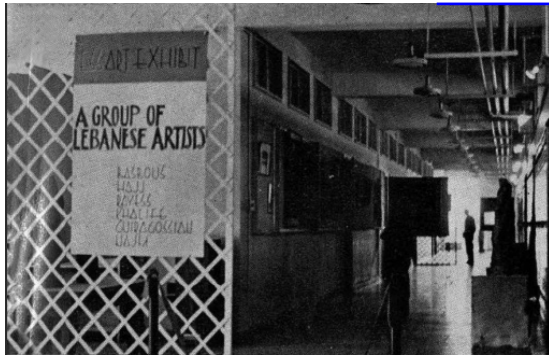


The Hunting Club



« Chess Tournament »

"If one missed his stool in the draughting room, which was often, all he had to do would be to take it from a group watching a chess game in progress somewhere. It would invariably be found there. This chess craze among engineering students is in evidence in the lounge where chess boards clutter up the tables. To organize the rivalry between the different students and classes Professor Abi Rached and Mr. Abadjian have announced a tournament between the four classes to take place during the month of May. "



(1955 yearbook)

The art sub-committee made it possible for art admirers of the Engineering community and their friends to meet the prominent Lebanese Artists : Michel Basbous, Halim Hajj, Aref Rayess, Mounir Nejim, Jean Khalife and Paul Guiragossian.



(1961 yearbook)

Art is being taught in the school. Professors Arthur Frick and John Carswell come from the upper campus to convey to the architectural students certain Art techniques.



(1962 yearbook)

« Driving Lessons »

A canoe where first-year engineering students have the privilege of teaching fifth-year engineering students is through the driving lessons program. This program is given to fifth-year students during their last term in School. Driving is taught within the A.U.B. campus and with the aid of the School jeep. The importance of knowing how to drive cannot be underestimated as it is too cumbersome and impractical for an engineer not to know it. Fifth-year students hence can easily pass the governmental test for acquiring a driving license but there is no guarantee that they will pass Mr. Nazarian's private test.



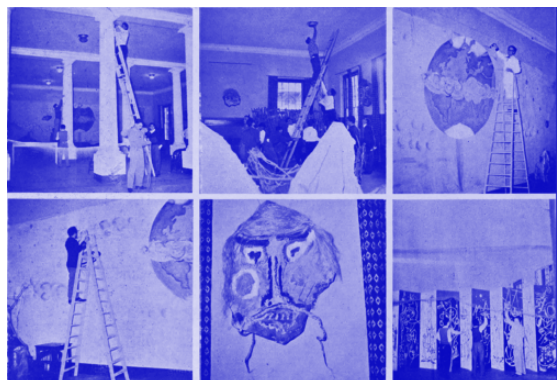
West Hall Common Room this year saw a record attendance enjoy the Engineering Christmas Target Ball.



For the first time in the history of the School of Engineering a Music General Knowledge Contest, sponsored by the Music Sub-Committee of the E.S.S. was held early in May this year for the four engineering school classes.

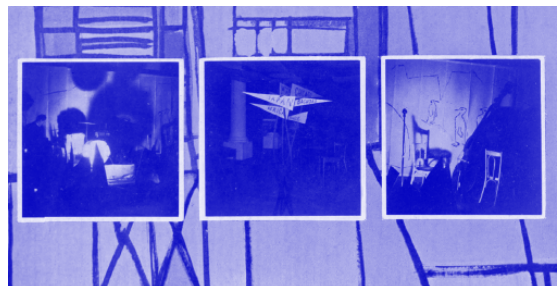
Subsection - Engineering Society Balls

1.



The Engineering Student Society at AUB has, over the years, produced many events that are to be fondly remembered in the history of the faculty. The years between 1956 and 1962, in particular, saw uniquely creative ideas for performances and balls. The Target Christmas Ball in 1956 for example was out of this Earth, literally. Themed around a rocket mission to the moon, and possibly influenced by the developments in satellite technology that year, the ball took attendees on a marvelous journey of the universe, as the West Hall walls stood decorated with cosmic spectacles of twinkly stars and distant planets, while the dance floor was cratered to model the feeling of a lunar voyage. The combination of vividly colored ornaments with bleak white and black left partygoers in awe, and the atmosphere must have been otherworldly. After that performance from the heavens, the Engineering Student

2.



Society (ESS) decided to opt for a more homely skit the following year. The engineers decided to divide West Halls into different "quarters," each representing a part of the world with a unique culture and traditions. On one end stood the Arab Homeland quarters with some classic hookah pipes, then was Japan, Africa, and so on, reaching till the American quarters on the other end, in which a "bar" was serving popcorn instead of drinks. The exhibits were complemented with art pieces and paintings that further displayed the characteristics of the different societies, as well as music that set a jolly, festive mood. Attendees had the opportunity to sit in any area and experience a bite from life in another civilization.

3.



You would be mistaken to think that the AUB Engineering Student Society was out of the Space Race quite yet. Just the next year, in 1958, the ESS held a target show, with the main skit portraying AUB's pioneer propulsion of humans towards the moon. Over 40 students of engineering took on a colorful assortment of roles from "Dr. Equation," the brain behind the flight mechanics of the mission, who seemed convinced to be a bird, to "Sir Archibald Flop," the over-excited overseer, who joined the mission himself. An "electronic brain," capable of providing assistance that a human could not also made a cameo. The three-act skit proved very entertaining, with the first two taking on an unusual, relatively unorthodox assembly of the rocket, and the subsequent takeoff of the spaceship, often interrupted by small gags here and there. The final act, supposed to be a culmination of the play with spaceman Fiasco DaGama and his crew reaching their destination, was somewhat lackluster compared to the previous parts, perhaps because it was written on the afternoon of the performance. At least that confirms that engineers have always had an affinity for procrastination.

4.



That was not the only skit of the target show, however. As a matter of fact, the audience was initially greeted with a unique performance by seven members of the Engineering Student Society. The dance, featuring “Samira,” “Stephanie,” and co. was quite enchanting, so much so that some might not have noticed that Samira was, in fact, Samir, Stephanie was Mustafa, and so on. The engineers managed to put on display their elegant dancing skills, natural acting talent, and great sense of humor. Their performance is even said to have attracted some unexpected admiration and love letters.

5.



A few years later, in 1961, engineering students took another trip; only this time, it was not towards the frontiers of the cosmos but into the vast depths of the Mediterranean Sea. Visitors were greeted with fish, whales, sharks, octopi, and other marvelous (and hideous) creatures of the depths. The aquatic trip was accompanied by a talented orchestra that kept the room rocking and listeners on edge. The dreamy ambiance from the dance of shadows and lights dragged attendees into a serene yet exciting journey through the waters and rocks.

Yet the treacherous seafloor was not deep or perilous enough for some, apparently, for another performance was portrayed in a place far deeper: hell. The play tells the story of Ali Boo Boo, a student who failed to get into the faculty of engineering at AUB and, in a moment of unwise desperation, struck a deal with the devil. Ali got to study engineering at H.I.T. (Hell Institute of Technology) in exchange for his soul, but after failing there too, he got the worst punishment of all: banishment to study engineering at AUB. This particular comedic display was enjoyed by some more than others.

«THE ENGINEERING STUDENT SOCIETY AT AUB HAS, OVER THE YEARS, PRODUCED MANY EVENTS THAT ARE TO BE FONDLY REMEMBERED IN THE HISTORY OF THE FACULTY. THE YEARS BETWEEN 1956 AND 1962, IN PARTICULAR, SAW UNIQUELY CREATIVE IDEAS FOR PERFORMANCES AND BALLS.»

End of subsection

ENTREPRENEURSHIP

AGRIDOC: WHERE FARMING MEETS AI

WRITTEN BY JOSEPH CHOEFAI

AgriDoc is a startup founded by three students from the Electrical and Computer Engineering Department: **Carl-Etienne Chaaya, Elie El Khawand, and Paul Frangie**. AgriDoc is designing an AI-powered solution for farmers and farming enthusiasts. Their solution aims to help farmers and agriculturists effortlessly diagnose their plants and identify pests that would affect their plants and crops. Additionally, AgriDoc's solution provides its customers with a smart mobile alert system as well as community and market functionalities that aim to build a community-based comprehensive Agriculture platform.

Most students at MSFEA feel like they don't have the time to grow an innovative idea of theirs into a startup. Carl-Etienne, Elie, and Paul probably felt the same way, but they had a very original idea for their final-year project (FYP), and they decided to turn it into a startup. MSFEA has always inspired and encouraged entrepreneurship and innovation. Part of the MSFEA's Entrepreneurship Initiative is the **FYP Accelerator Program**. The FYP Accelerator Program aspires to mature MSFEA students' entrepreneurial potential by helping them develop their FYPs into startups. The program provides them with mentoring and support of subject-matter-experts that will eventually help scale their project so that it reaches market-level readiness. Paul, Carl-Etienne, and Elie, with the guidance of their FYP advisor, Dr. Mariette Awad, decided to join the FYP Accelerator.

Paul Frangie, one of the founders of AgriDoc, mentioned that "the FYP Accelerator provided us with significant coaching and support. From identifying our target customer segments to setting up our value proposition, business model, and building an investor-ready pitch, the program taught us valuable insights and linked us to key resources that proved to be extremely valuable to our startup."

Currently, **AgriDoc is in the process of finalizing its initial version of the product**. Simultaneously, the team is working on their business model in order to scale the capabilities and reach of their project and vision.



Aside from the FYP Accelerator, MSFEA as a faculty continuously plays a fundamental role in the development and launching of numerous startups. According to Carl-Etienne, "MSFEA provided us with immense knowledge that enabled us to build our startup from the ground up. Let's not also forget the skills that MSFEA fosters in every student from integrating hands-on projects to complementing the theoretical in almost all courses." Like many MSFEA startups, AgriDoc was significantly influenced and supported by the knowledge and resources provided by the faculty of engineering. All students that believe their FYP is an impactful one, should consider joining the FYP Accelerator Program. The benefits of this program are many, but along the journey of being part of the Accelerator Program is gaining valuable insight and mentoring on how to build a start-up from scratch, thus fostering the entrepreneurial spirit in more MSFEA students.

STOVE: A SOLUTION TO THE HEATING CRISIS IN LEBANON?

WRITTEN BY SABINE EL BABA

In a world where power defeats justice, money defeats humanity, and cruelty prevails, the poor are left unheard and stranded longing for a chance of survival. Over the past years, Lebanon, which was previously known as “The Paris of The Middle East,” has experienced and is still experiencing some of its darkest days. With Lebanon going through its worst economic crisis since the civil war, a recent report by UNICEF recorded that more than 75% of the Lebanese population now lives in poverty.

That being mentioned, two bright Mechanical Engineering students, **Joseph Bejjani** and **Peter Jabbour**, adopted the issue of discovering a passive heating system as their final year project. **The aim of their project is to help the Lebanese population heat their homes and offices in an affordable way while eliminating the reliance on electricity or any other traditional fuel source and limiting the environmental effects.** Their project's purpose can be resumed in a quote by Jason Fried, CEO, and co-founder of software company 37signals: “Limited resources force you to make do with what you've got. There's no room for waste.”

The aim of the project is to provide a method similar to the traditional “Sobya” (صويا), but that is cleaner, has a longer lifespan, and cuts peoples' heating bills. The striking news that some families in Lebanon are using charcoal and other dangerous methods to heat their homes, especially after the fuel crisis resulting in a surge in prices by more than 1100%, inspired the two young engineers to invest in such a project.

During that ongoing journey of finding the perfect solution, several virtual and actual prototypes were made. The prototype did not only run on waste oil, but was also developed to heat water, cook, and most significantly heat space. What also distinguishes their 100% locally produced model is an innovative filtering technique that they invented which captures 75% of flue emissions. Currently, the team is running simulations on the fourth and final virtual prototype of their model to enhance its functionality.

Under the supervision of Dr. Ramsey Hamade, a mechanical engineering professor and the team's technical advisor, the team was able

to discuss the viability, possibility, and usability of using waste oil as a heat source with a professional. Moreover, they were able to take their work to the next level through the FYP Accelerator Program.



Aiming to transform their FYP into a commercial product that benefits the Lebanese community, the team decided to join the Accelerator Program to increase their chances of making a difference with the guidance of Dr. Elie Chammas. Through the program, the team aims to gain funding to take their prototype to the lab to validate all the tests and enhance their product's efficiency to finally take off with their startup and start manufacturing their product. In addition to the above, **Mr. Mohamad Fanous**, the FYP Accelerator Program instructor, guided the team through their business journey by providing them with business classes and insight on how to elevate their startup to the next level.

Joining the Accelerator Program turned out to be a fruitful experience for the stOve team which ended up taking second place in the MSFEA Entrepreneurship Competition in May 2022 and being granted funding of \$10,000 to pursue their idea! Naturally, the team was very grateful for the support as Peter Jabbour, one of the co-founders, mentioned: “We are grateful to MSFEA for providing the necessary funds to move forward with our project.”

With the rise of a great amount of concerning issues, the future seems puzzling. However, looking at the bright students at MSFEA that are striving to use their knowledge and experience to create a social impact and implement change, one gets a sense of hope for the future.

SKANMD & CANCER: THE STORY OF NADER SHAFI

WRITTEN BY DIMA HIJAZI

Every year, MIT Technology Review Arabia honors and celebrates Arab innovators under 35 to highlight their impactful innovations. Nader Shafi, a research associate, and entrepreneur at MSFEA was listed as one of the winners of the fourth edition of the Innovators Under 35 award for co-founding SKanMD, a smart skin cancer detection device.

Shafi is a 26-year-old Lebanese who obtained his Bachelor's Degree and Master's Degree in Electrical and Computer Engineering (ECE) in 2018 and 2020 respectively from the American University of Beirut. Currently, he is working as a research associate on innovative projects in AUB's Electromagnetics, Radio-Frequency (RF), and Antennas Lab. During his undergraduate degree, he had the opportunity to take RF and electromagnetics courses which cultivated his interest in the field and allowed him to discover untapped potential. More specifically, he mentions **Dr. Joseph Costantine**, professor of electromagnetics at AUB, whose passion for the subject has significantly impacted his interest and involvement in the field.

SKanMD started as an idea for his final year project in 2018. His team wanted to solve a prominent medical issue for their project. Fortunately, the MSFEA Startup Accelerator had just been announced by Professor Ayman Kayssi in the same year. He joined the first cohort of the accelerator, where **SKanMD** ended up winning second place and receiving their first funding prize of \$5,000.

Shafi believes the accelerator program remarkably contributed to his success. During the program, he learned about the essentials of starting a business, received training on pitching, and enhanced his presenting skills. He adds that, had it not been for the high-end entrepreneurship and research resources provided at MSFEA, it would have been extremely difficult for him to make it this far with his project.

According to Shafi, the same waves traveling through thin air between our phones and wifi routers can be used to detect **skin cancer**. Through his expertise in radio-frequency and electromagnetics, he aims to develop advanced technologies that enhance the medical personnel's tools and techniques for the diagnosis and monitoring of diseases.

SKanMD is a handheld pen-like device that rapidly determines if skin tissue is malignant or benign through the emission of electromagnetic waves. This device is implemented using optimally designed RF sensors and programmed using smart algorithms. It is used in the following manner: the dermatologist positions the device on the skin lesion and starts recording measurements. This device relies on a built-in machine learning algorithm that compares the results to certain thresholds to detect if the skin is cancerous or not.

Each skin type has exclusive dielectric properties specific to it. Upon positioning the device on the skin, the sensor builds a focused electromagnetic field around its sensing tip resulting in increased sensitivity to dielectric characteristics. This generated electromagnetic field reacts differently according to the nature of the skin beneath it. After thoroughly analyzing this response, the nature of the skin lesion can be detected.

SKanMD is envisioned to become a commercialized device for medical and personal use.

By detecting diseases and monitoring skin conditions, **SKanMD** is transforming dermatology diagnostics. Shafi's advice for aspiring student entrepreneurs is to get out of their comfort zone and learn how to present their ideas very well as this boosts their chances of success.



REVOTONIX & ROBOTICS

THE STORY OF
ABBAS SIDAOU

WRITTEN BY JOSEPH CHOEFAI

The Forbes 30 Under 30 list is a prestigious list that aims to acknowledge and appreciate individuals under the age of 30 years old for demonstrating substantial achievements and potential. Similarly, the MIT Innovators Under 35 list is also another reputable list that aims to promote entrepreneurship and innovation. Abbas Sidaoui was placed on both the 2019 MIT Innovators Under 35 list for the MENA Region and the 2020 Forbes Middle East 30 Under 30 list for his achievements in the robotics space through **the company he co-founded: Revotonix.**

Sidaoui obtained his Ph.D. in Electrical and Computer Engineering from MSFEA, with research interests in human-robot interaction, which drove him to co-found Revotonix, the first robotics startup in the region, and serve as its chief technology officer (CTO). **Revotonix aspires to bridge the gap between research and industry, as well as provide services in the region through the use of robots and artificial intelligence.**

Abbas and his partner's idea to create a robotics startup stemmed from the fact that they were not able to find any robotics jobs in Lebanon or the MENA region. When Abbas and his partner decided it was the right time to launch Revotonix, they were concerned about having a strong market entry, since back in 2018-19, according to Sidaoui, there was very minimal awareness and knowledge about robotics in the MENA region. Moreover, the advertisement industry in the GCC countries was one of the highest revenue markets in the region. So, with these ideas in mind, Sidaoui decided that the first product of Revotonix would be an advertising and customer support robot called **"Felix."** **Felix is a human-sized robot with two large screens that can navigate autonomously in indoor venues.** Felix was capable of roaming around venues, approaching humans, and stopping at interaction distance.

After Felix has approached a person or a group of people, using artificial intelligence, it would analyze the age, gender, and accessories of the humans and then display targeted ads that might interest them. These ads are provided by the advertisers to Revotonix. When the advertisers upload their ad on Felix, they can select certain attributes for their target audience. The main idea is to display targeted



ads instead of randomized ads in order to increase engagement and conversion to real customers. Revotonix's goal was to shift into the development of other robots that provide other services after they help in creating awareness about robotics in the region.

Sidaoui later developed two new robots at Revotonix during the coronavirus pandemic. The first one is named **"SASHA,"** which is an acronym for **"smart autonomous system for hospital assistance"**. SASHA is a meal-delivering robot, which can deliver meals from the kitchen to patients in hospitals. SASHA was tested and validated in a hospital in Qatar. However, they were not able to integrate it into hospitals because of the very strict regulations

in the region. Sidaoui claims that these strict regulations are one of the challenges faced by Revotonix and other robotics companies in the Middle East. SASHA was then pivoted to suit more industrial settings instead of hospitals. The second robot called **“ZenZoe”** was developed in collaboration with a Spanish robotics company. **ZenZoe is a robot that roams venues autonomously and kills pathogens by disinfecting surfaces using UV light.** Revotonix provided the software for ZenZoe, while the Spanish company provided and designed the hardware. During the age of coronavirus, you can imagine why a robot-like ZenZoe is more impactful than ever.

When Sidaoui was asked about how his studies at MSFEA played a role in the launching of Revotonix, he states that he applied 100% of the knowledge he learned during his Ph.D. to launch his startup. “Autonomous Mobile Robots” was a course that he took at AUB which he claims played the biggest role in shaping the technical skills that he needed for the launching of a robotics startup. Of course, these weren’t the only courses that helped him in launching his startup. This course helped build the foundations for the knowledge he was going to acquire at a later stage. AUB and its professors also provided him with the right guidance to publish 5 research papers in two of the best conferences/journals in the world. **MSFEA played a key role in helping Sidaoui reach these prestigious lists.** For the MIT Innovators Under 35 award, he was nominated by Dr. Elie Shammas, an Associate Professor of Mechanical Engineering at MSFEA. He was then placed on the MIT list for both his research at AUB and work at Revotonix. For the Forbes Middle East 30 Under 30 list, an official from Forbes reached out to him stating that they would like to nominate him for the award in recognition of his work at Revotonix.

Sidaoui says that, on a personal level, the Forbes 30 Under 30, and MIT Innovators Under 35 lists both made him feel like his hard work is indeed paying off and being recognized. On a professional level, he claims that being on these two lists gave him a certain type of credibility when pitching his ideas. Being placed on these two lists have positively pressured him to keep on improving in his work and career.

Sidaoui has three pieces of advice for students aiming to launch a successful startup themselves.

- First, it is to be motivated about the purpose of their business because, when developing a startup, there will be a lot of obstacles that they need to be ready to overcome.
- Second, they must have the right market fit, meaning a business should provide value in the context of a certain setting.

- Finally, they should be open to the idea of criticizing and pivoting the product when necessary. Sidaoui also advises students to gain some experience in the industry before launching their startup, that is to learn more about the culture of startups, their strengths, challenges that are faced, and how to solve problems overall.

Going back to his own outlook for the future, Sidaoui announced that, after two years in the market, Revotonix, which used to develop both the hardware and software for robots, has decided to pivot into a pure software company that develops software for robots. In brief, by the end of this pivot, **Revotonix will still serve the same purpose as it did at the start, albeit by concentrating solely on the software aspect of robots which will help them gain a better competitive advantage in the region’s market.**

«**FELIX IS A HUMAN-SIZED ROBOT WITH TWO LARGE SCREENS THAT CAN NAVIGATE AUTONOMOUSLY IN INDOOR VENUES. FELIX WAS CAPABLE OF ROAMING AROUND VENUES, APPROACHING HUMANS, AND STOPPING AT INTERACTION DISTANCE.**»

CLOUD PADS

REDESIGNING THE
PERIOD EXPERIENCE

WRITTEN BY ZEINA SHATILA



Despite the fact that around a quarter of the population menstruates, menstruation is still a stigmatized issue. Not only are a couple of innovators at MSFEA destigmatizing periods, but they are also making them eco-friendly. **Cloud Pads is a novel idea that aspires to redefine the period experience.** They leverage the natural benefits of banana fibers to make pads come from and go back to nature.

You surely have heard about **banana fabric** somewhere, especially if you're into fashion. In case you haven't, as you would expect, the banana fabric is just remodeled banana peels. It is used because it makes the textile smoother and more delicate. Sustainable textile innovators are slowly acknowledging the potential of banana fibers in the production of organic clothing. Furthermore, banana fibers are naturally super absorptive, plastic-free, and chemical-free, hence gentle to the skin. For these reasons, **Cloud Pads is making menstrual cycles banana fiber reinforced by creating healthy plant-based, biodegradable, and compostable sanitary pads.**

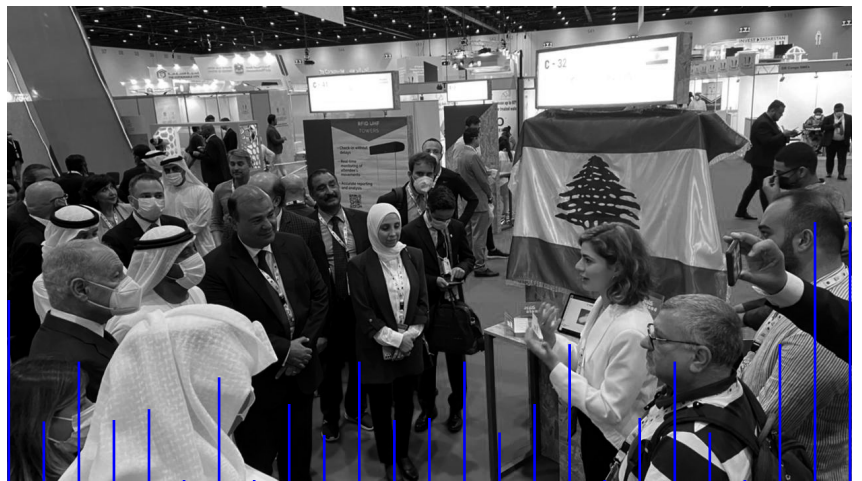
Conventional pads consist of toxic fragrance chemicals and plastics. These toxins often cause rashes, allergies, and infections when rubbed on sensitive areas for long durations. Accordingly, **Cloud Pads intends to protect women from more than just leaks.** Manufacturing conventional pads releases tons of carbon dioxide. After one-time use, sanitary napkins are disposed of in acres of landfills. These non-biodegradable pads require a minimum of 500 years to decompose, which can cause environmental and health hazards. In short, microscopic plastic particles pollute lands and water through their movement across the food chain, harming living organisms simultaneously. Unlike conventional sanitary pads, Cloud's banana fiber-based pads reduce agro-waste by using banana waste as sustainable raw materials. Cloud Pads require a maximum of 6 months to degrade and eventually decompose into compost. Therefore, **Cloud Pads promote a circular economy and positively impacts the environment.**

Cloud Pads began as a project that tackles global societal issues in an architectural entrepreneurship class. It saw the light at the hands of a collaboration of 5 Architecture students: **Sarah El Harouny** (Archi '21) who handles the business strategy, **Lina Hammoud** (Archi '21), who's in charge of product design, **Yara Haydar** (Archi '22), who is the marketing manager, **Myriam Abou Adal** (Archi '22), the team's brand developer, and **Amir Moujaes** (Archi '22), in charge of operations.

With the support of the course's instructor, Ms. Aya El-Jazaeri, the students participated in the 2021 MSFEA Student Startup Competition, where they received their first funding. This motivated the team to keep going and thus they applied to the iPark accelerator program and the President's Innovation Challenge, in which they won second place. **The team furthermore won 2,000\$ in funding and placed third at the Arab Entrepreneurship and Innovation Rally as part of the World Entrepreneurs Investment Forum 2022 in the long-awaited Expo 2020 Dubai.**

So far, because of the brilliancy behind Cloud Pads, the startup has received multiple seed-level funding to develop its business plan and implement it. Cloud Pads is currently working on community building through hosting sexual and reproductive health educational events. Cloud Pads' team intends to begin producing and commercializing pads in the market by at most six months from now. Unlike the mass-produced conventional sanitary pads, Cloud Pads will follow a unique launching approach. The business will be based on subscription models instead of retail mass distribution.

From rebranding periods to shifting global cultures and integrating sustainability into business, **Cloud Pads is changing the period narrative with a holistic approach.**



UNLIKE THE MASS-PRODUCED CONVENTIONAL SANITARY PADS, CLOUD PADS WILL FOLLOW A UNIQUE LAUNCHING APPROACH. THE BUSINESS WILL BE BASED ON SUBSCRIPTION MODELS INSTEAD OF RETAIL MASS DISTRIBUTION.

**RESEARCH
AND INNOVATION**

SLEEP APNEA AND THE FIGHT FOR BETTER SLEEP

DR. JASON
AMATOURY

WRITTEN BY MAROUN WAKIM

Sleep Apnea is a critical health condition where the upper airway in the throat repeatedly closes during sleep. This is due to muscle relaxation in the throat resulting in a negative pressure sucking all the air and blocking the airway completely. It will continuously happen throughout the night, where mild cases are about 5 to 10 events per hour, and severe cases could reach more than 110 times per hour. The amount of oxygen and carbon dioxide in the body becomes unbalanced due to interrupted breathing, where carbon dioxide may build to a toxic level causing cortical arousal. The latter is a phenomenon in which sensory receptors wake up the individual by stimulating the muscle in the upper airway and activating the essential muscular activity for breathing.

PEOPLE WHO SUFFER FROM SLEEP APNEA COMMONLY EXPERIENCE SLEEP DEPRIVATION, DEPRESSION, COGNITIVE ISSUES, CARDIOVASCULAR DISEASES LIKE HIGH BLOOD PRESSURE, HEART ATTACKS, STOKES, HYPOXIA, STRESS, ANXIETY, AND TYPE 2 DIABETES.

The causes behind sleep apnea are multifactorial and could depend on the anatomy, jaw structure, hyoid bone, muscle response, and gravity. The hyoid bone is the only bone in the body that can move, it is involved in speech, swallowing, and breathing. Current studies show a correlation between sleep apnea and the position of the hyoid bone where the more severe sleep apnea is, the lower the hyoid bone. Therefore, figuring out the role of the hyoid bone is essential to understanding its impact on medical therapy by conducting experimental studies and computational modeling.

Dr. Jason Amatoury, assistant professor at the Biomedical Engineering Program, along with his Sleep and Upper Airway Research Group (SUARG) is conducting essential studies to further analyze sleep apnea. The research is divided into several parts aiming to narrow down the causes, develop new treatments and improve diagnosis.



Dr. Amatoury states that sleep apnea is under-diagnosed with 15% of the population suffering from it, but only 10% of those are aware of their condition. Furthermore, the primary treatment of sleep apnea is the CPAP masks which is a device that provides positive pressure on the airways and keeps it open. The device is uncomfortable to wear resulting in about 50% of the individuals not using it. So further studies are needed to improve current treatment mechanisms and improve their efficacy.

In short, this research is a necessity for all undiagnosed individuals to get the proper treatment and the right medication aiming to lower the risks of side effects and get better sleep.

E-CIGARETTES REGULATION VIA 'NICOTINE FLUX'

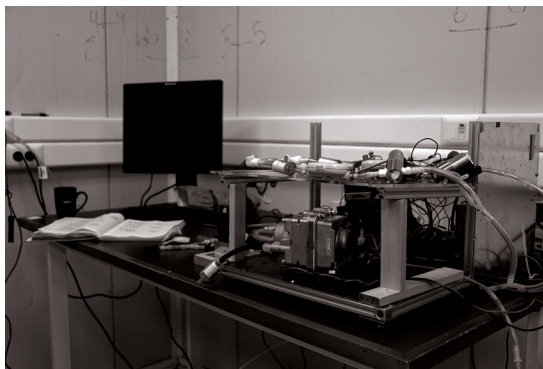
DR. SOHA TALIH

WRITTEN BY MAROUN WAKIM



Electronic cigarettes are part of a large group of devices known as electronic nicotine delivery systems. These systems contain nicotine concentrated liquid that gets heated, vaporized, and absorbed into the blood via inhalation. The usage of those systems has escalated throughout the last decade without any regulations or prior knowledge on how to limit nicotine emissions.

In an attempt to regulate nicotine delivery of electronic cigarettes, a team at MSFEA in collaboration with researchers at Yale University have proposed to study "nicotine flux", a concept which represents the potential speed at which nicotine reaches the brain and a key factor for drug addiction. The project team is composed mainly of: Dr. Soha Talih (PhD, Mechanical Engineering), Dr. Ahmad El-Hellani (PhD, Chemistry), Dr. Farid Talih (MD, Psychiatry), Dr. Martine El-Bejjani (PhD, Neuro-epidemiology), and Dr. Stephen Baldassarri (MD, Pulmonary/Critical Care at Yale University). The team is also advised by experts in the field of tobacco research including Profs. Alan Shihadeh, Najat Saliba, and Thomas Eissenberg, and was recently awarded \$1.4 million by the US NIH to complete the study.



This 3-year long project focuses on developing an interdisciplinary framework that aims to answer the following question: Does nicotine flux predict the speed at which nicotine reaches the brain and does it predict user addiction?

Dr. Talih (PI) explains that e-cigarettes are unique compared to other tobacco products. Unlike regular combustible cigarettes which generally last for a few minutes before burn-off and where the tobacco is pre-packed, e-cigarettes can be controlled by its users: They can replace or modify the liquid, electrical battery, etc. which affects how much nicotine is emitted from the device and the overall sensory experience and addiction. Thus, regulating e-cigarettes is relatively challenging. However, Nicotine flux covers all these features and combines them into one single metric that can be predicted using physical tools. Ultimately, proving that nicotine flux is related to addiction will make e-cigarettes regulation an easier task.

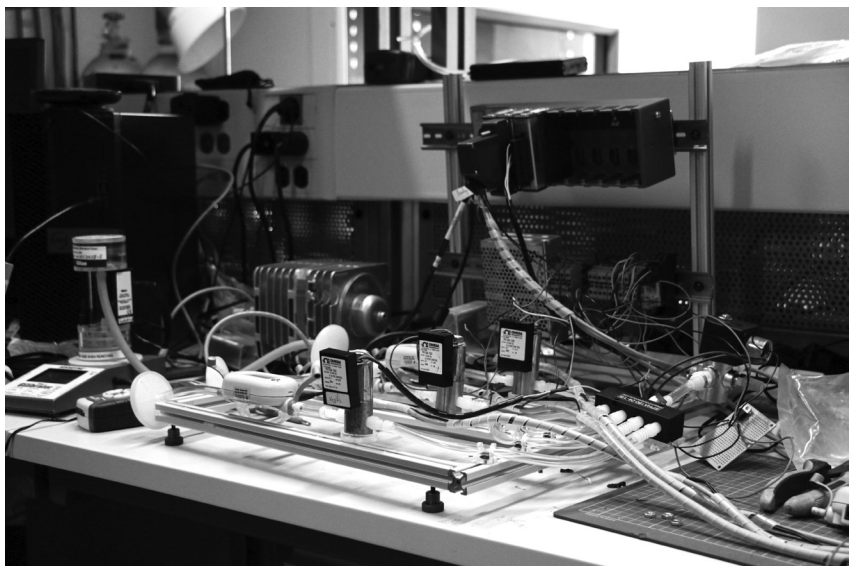
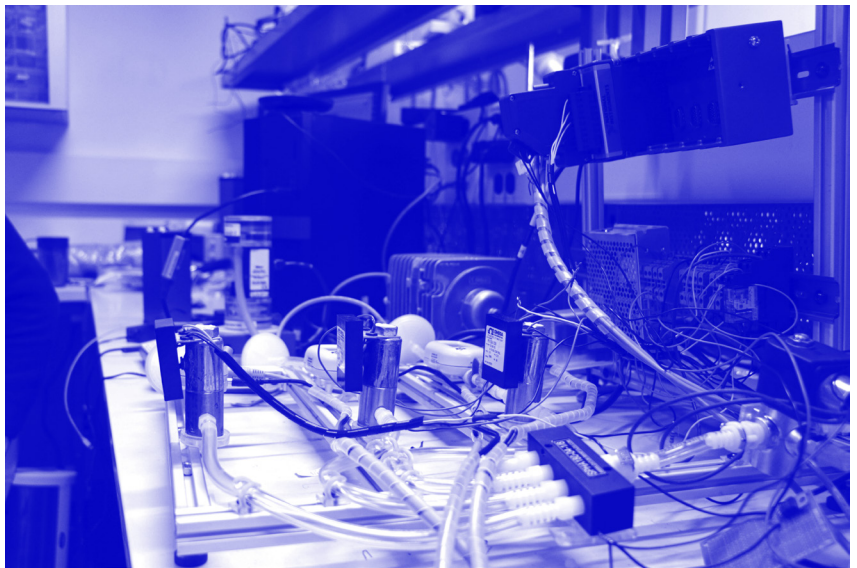
To test this hypothesis, the project was divided into two parts. One part will be completed at AUB and another part at Yale University. At AUB, the team will recruit more than a hundred participants to test several nicotine fluxes and will collect surveys to assess addiction and measure the levels of toxicants (including carcinogens) being inhaled. At Yale, nicotine in the blood will be measured right before it reaches the brain, and link nicotine flux to the speed and dose of nicotine delivery.

An interesting device at the AUB Aerosol Research Lab is crucial in making the research feasible:

THE “PLAYBACK” PUFFING MACHINE

First developed by Dean Shihadeh in 2006, the machine can reproduce previously recorded individual human puffing behavior in detail. It generates aerosol from e-cigarettes (and other tobacco products) and is trapped on filters, which then get analyzed for toxicant content.

Although the project is still at its early stages, the team's outstanding research proves to be highly promising for completing the project.



BIOREMEDIATION OF CRUDE OIL USING MICROBIAL POPULATIONS

DR. DARINE
SALAM

WRITTEN BY MALEK SUCCAR

Oil and gas exploration activities in the Mediterranean from drilling and extraction to transportation pose a high risk of oil spills and leakages, which can have a detrimental effect on aquatic life. Specifically, Lebanon's envisaged petroleum activities can further cause a devastating impact on the Mediterranean marine environment. **Cleanup of oil spills usually takes a lot of effort and consists of multiple stages where oil contamination cannot be ultimately 100% removed.** However, the presence of hydrocarbon-degrading microbes helps significantly in the treatment process via bioremediation, a naturally occurring process where microbes consume and break down environmental pollutants. Researchers at the MSFEA Department of Civil and Environmental engineering spearheaded by Dr. Darine Salam have determined the presence of such bacteria on our coastline.

A work first of its kind, Dr. Salam's team has conducted a study to characterize these microbial populations along the entire Lebanese shoreline. The study began with sediments collected from the shoreline and tested via physicochemical analysis in the MSFEA labs. The quantity of nitrogen and phosphorus, essential nutrients for hydrocarbon biodegrading bacteria growth, was checked followed by DNA extraction done in the lab. To be able to determine exactly what species was present, the sediments were sent to the United State where 16S rRNA gene sequencing was performed. Moreover, data analysis was done in our labs to compare the microbial population with official databases, as well as their distribution and diversity using specific statistical tools. In order to determine these bacteria's effect on degrading hydrocarbons, Dr. Salam's group collected in another study sediment samples from Ramlet El Bayda and polluted them with crude oil.

The experiment lasted 42 days where 11 sampling events occurred to check if crude oil quantities were decreasing and the kinetics of bioremediation. **It turned out that such sediments contain the needed bacteria for the biodegradation of crude oil into CO₂ and H₂O which are harmless, natural, and organic compounds.**

THE PRESENCE OF BIODEGRADING BACTERIA FOR HYDROCARBONS WAS ASSOCIATED WITH THE HIGH POLLUTION LEVELS ALONG OUR COAST.

A combination of raw sewage being discharged into the sea and open dumpsites contribute to the rise of BOD (Biochemical Oxygen Demand) levels, which in turn increases quantities of nitrogen and phosphorus. Previous research shows that such bacteria are good degraders of alkanes and PAHs (Polycyclic Aromatic Hydrocarbon) and their presence on our Lebanese coast is a very good indicator of oil cleanup capability.

Additionally, **it was found that no biostimulation (active addition of nutrients) was required since existing pollution had created a nurturing environment for the bacteria's growth.** The bacteria also prove to work better in the summer, where the kinetics of biodegradation double for every 10 degrees increase in temperature. Therefore, if the right factors were provided, the bacteria can thrive and thus have a faster cleanup.

With our ever-increasing pollution on our Lebanese coastline, Dr. Salam's study shows that our sea microbial ecosystem is capable of the bioremediation of hydrocarbons.

NANOPARTICLES: A POTENTIAL CURE FOR CANCER?

DR. WALID SAAD

WRITTEN BY MALEK SUCCAR

Nowadays, many molecules discovered are capable of curing certain chronic diseases, but they are oftentimes too toxic or hard to formulate into a form that could be administered to the body. For example, people undergoing chemotherapy suffer from fatigue, hair loss, infections, etc. which makes this therapeutic approach very limited. Such side effects occur because the drugs accumulate in undesired areas in the body away from the tumor, which prevents the patient from taking the necessary doses to kill the tumor.

Dr. Walid Saad, an Associate Professor in the Chemical Engineering Department at MSFEA, has been working on a new approach using nanotechnology to make drugs more targeted and specific to the ailment rather than flowing through the entire body.

Dr. Saad uses nanoparticles to make drugs less toxic and more efficient at killing cancer cells. He worked with Dr. Nadine Darwish from the Faculty of Medicine on a molecule called ST1926, which was discovered to have very good anticancer activity in vitro, specifically for acute myeloid leukemia. After doing the preclinical tests, it was tried on humans as a phase one study and it turned out that the molecule is not doing its job since it was undergoing glucuronidation, a process where the molecule is detected in the patient's body and then gets cleared immediately. This is because there are proteins and T cells in the bloodstream that would absorb it and take it out of circulation.

Since the body is recognizing the ST1926 molecule, Dr. Saad and his team thought of a way to mask it from the immune system: They "decorate" it with polymers, which are long chains of repetitive biocompatible molecules covalently attached, making the molecule go by incognito for several hours in the body which is enough for it to go to the tumor. It was tested on mice, and they noticed that there is a similar effect of using the nanoparticle as the naked drug as using it with only a quarter of its concentration.

Achieving the same therapeutic outcome with much less concentration is a very good indication of the drug's efficacy.

For such a particle that is around 100nm in size, it necessitates a unique technology for it to be formulated into drugs and covered with these polymers. To achieve this, a specific mixing technique called flash nanoprecipitation is used, which Dr. Saad worked on during his PhD and brought it along to the nanoparticle processing lab. The drug is dissolved in an organic solvent with the polymers, then using two 100ml syringes, one with the drug and polymers, and one with water, they apply high intensity mixing at a confined volume. Since part of the polymer is hydrophobic, the molecule is going to nucleate and form small nuclei of a few molecules, which are thus used to target the specific tumor cells. These nanoparticles still await to be tested in clinical trials.

The world is heading towards more personalized and targeted medicine and designing specific drugs by studying the genetic makeup of the ailment is the new challenge many companies are trying to tackle. **Using engineered nanoparticles has great potential in achieving the desired therapeutic outcome and this technology can be used as a platform for several areas such as Covid vaccines.** But even though there is very little infrastructure and limited funding opportunities to support such work in Lebanon, with the help of MSFEA's state of the art labs and the excellence of AUBMC, Dr. Saad's research, if proven to be successful, is likely to have a very wide impact.

ECOWHEELS: SOLAR POWERED GOLF CARTS

MECH FYP

WRITTEN BY MALEK SUCCAR



FOR MORE THAN TWO YEARS, LEBANON HAS BEEN BATTLING A DEEPENING ECONOMIC DEPRESSION FORCING THE COUNTRY INTO A MAJOR SHUTDOWN ACROSS ALL SECTORS.

On top of the long list of never-ending crises, fuel shortages and record-breaking fuel prices have become a serious concern which have caused significant disruptions to almost every aspect of our everyday lives. Like all Lebanese, MSFEA seniors Nasr Daou, Victor Fayad, Ali Farhat, Elie Bouzerdan and Hussein Diab were forced to sit in the long queues this past summer, waiting an entire day to fill up their cars before heading for their internships. Disturbed by this situation, they decided to come up with a solution to the problem as their Final Year mechanical engineering Project (FYP): A solar powered vehicle.

AND THIS IS HOW ECOWHEELS WAS BORN.

Designing a solar powered car was not an easy challenge, but the team knew that it was worth the effort: A car that runs completely on solar power would not only reduce the need of relying on gasoline but also helps save the environment in a country like Lebanon where 25.5% of CO2 emissions result from transportation. To make the most out of their funding and budget, the team decided to bring a broken-down electric golf cart back to life by running it on solar panels. The cart used to be operated by the AUB Protection Office. Despite the many engineering hurdles they faced throughout, the team was committed to making it work and did not give up easily.

Before the solar implementation, the cart had 6 batteries weighing around 180 Kg, which they replaced with 2 lithium-ion batteries that weighed around 90 Kg, half the original weight. The studied design was simulated on ANSYS where heat and thermal analysis were performed. The design successfully passed the necessary safety factor and was ready to be implemented physically. The entire structure of the cart had to be changed to account for the additional weight of the panels: Three 1.7mx1m solar panels had to be made fit and installed on top of the cart. The team also needed to take care of multiple engineering constraints such as the aerodynamics and the weight distribution of the car, the axes of the shaft, the material types, etc. The design also had to take into consideration human comfort and the center of gravity to avoid the car from flipping due to the heavy weight of the panels. Aside from changing the structure, there were a lot of electrical configurations that needed to be taken into account, which was another major challenge as these were custom made for the cart.

The cart needs about 9 hours of sunlight exposure to get fully charged from 0 to 100% compared to 24 hours via electrical charging. It can run for 4 to 5 hours on a single charge and if it were to be used while being charged, it can potentially run for much longer time. Charging time can be further enhanced by following the optimal monthly tilt angle of the cart, where the average tilt angle over the entire year is 34 degrees.

USING THE SOLAR POWERED CART IS ESTIMATED TO SAVE \$2,700 IN NET PRESENT VALUE OF MONEY FOR 10 YEARS WHICH IS THE LIFETIME OF THE CART.

The team recognizes that the work would not have been possible without the immense support of their advisor Dr. Samir Mustapha who offered amazing help and guidance in every step throughout the process. They are also grateful for the advice they received from previous MSFEA alumni who worked on similar FYPs, and for the support of their sponsors who made the project realizable. Most importantly, the team prides itself on having implemented their engineering knowledge and skills learned throughout their 4 years at MSFEA and come up with a solution to a problem, making a direct impact on campus and university life.



**INITIATIVES
AND EVENTS**

COMBATTING COVID-19 MISINFORMATION IN REFUGEE COMMUNITIES: WIKAYTEK

A HUMANITARIAN
PROJECT

WRITTEN BY LYNE YAMOUT



“TOO MUCH INFORMATION INCLUDING **FALSE OR MISLEADING INFORMATION** IN DIGITAL AND PHYSICAL ENVIRONMENTS.”

The World Health Organization's definition of infodemic is one that the global society has become all too familiar with since the very beginning of the COVID-19 pandemic.

Wikaytek is the Humanitarian Engineering Initiative's approach to combating pandemic-related misinformation in the local community. This platform emerged from the evident need for accurate, reliable, and consistent information among underprivileged communities in Lebanon, at a time where the discourse surrounding coronavirus and vaccination was riddled with conspiracy theories, scaremongering, and lack of awareness.

Humanitarian Engineering Initiative: Innovate For Change

The Humanitarian Engineering Initiative, or HEI, was formed in 2017 by the joint efforts of AUB's Faculty of Health Sciences (FHS) and Maroun Semaan Faculty of Engineering (MSFEA) in the face of increasing humanitarian crises at both the local and global scales. The HEI's mission is to address health vulnerabilities in underprivileged communities through innovative, interdisciplinary, and context-sensitive interventions, as well as to empower students, faculty and professionals who share the Initiative's drive for health and well-being.

In addition to HEI's flagship course, Designing Solutions for Health Challenges in Crises, which is offered yearly to students and professionals from various disciplines, the team also implements service and research projects.

With the onset of the COVID-19 pandemic in 2020, the Initiative's role became even more essential. Most notable is their design and development of Ma3an, the official coronavirus contact tracing app in the country, in tandem with the Lebanese Ministry of Public Health and TedMob's digital transformation services.

As the pandemic progressed in time and the focus shifted from understanding the virus to combating it, and with the approval of various vaccines around the globe, the need for proper information in the community became dire, which urged HEI to launch their next COVID-19 response project: Wikaytek.

Wikaytek: Sohtek B Maaloumatek

From the Arabic noun وقاية (wikaya), meaning protection, the project's name is feminized in second person as a reference to its primary target population: the Syrian refugee women community in Sin El Fil. By research and design, the HEI student team – lead by HEI coordinators Aline Germani and Dr. Imad Elhajj, from FHS and MSFEA respectively, in addition to Dr. Marco Bardus from FHS – successfully fulfilled the slogan of the project: “your health is in your information.”

The design process started with the necessary first step of any humanitarian project: needs assessment among the target population. The lack of proper information surrounding COVID-19 first became evident during a project lead by FHS in the Sin El Fil refugee community; HEI embraced this challenge and launched a qualitative data collection process aimed specifically at the issue of misinformation.

The field research consisted of thorough interviews with women from the target community and lead to the identification of multiple limitations, such as:

- Language: the prevalent language in the Sin El Fil refugee community is Arabic.
- Literacy: many of the target users are unable to read.
- Mobile phone use: WhatsApp is the dominant social communication platform
- Internet access: many members of the community subscribe to WhatsApp-only mobile data plans with limited usage quota.

Once these design constraints were identified, the next step was to bring them together into a feasible, desirable, and viable design. This means that the solution must not only be technically achievable, but must also be acceptable to the target population, and reasonable to sustain

on HEI's end. The outcome of the brainstorm phase was the following: a process through which Twitter posts from reliable sources of COVID-19 information, such as the World Health Organization and the Ministry of Public Health, are translated to Arabic (if needed) and converted to audio messages, which are then forwarded to a WhatsApp group chat comprising women from the target population. The platform combines automated features and human administration, which is needed to ensure the relevance of the selected posts and the quality of their translations.

An important aspect of any humanitarian project is post-assessment, during which the target population's engagement with, and perceptions of, the provided intervention are monitored. To achieve this, the HEI students working on Wikaytek implemented a feature that allowed them to view the number of participants that listened to each audio message and use that to track engagement with the service.

The team also collected feedback directly from the Sin El Fil refugee community through interviews with women participating in the group chat; their responses vouched for the success of the intervention. The women found the messaging useful and considered it credible – so much that many of them went ahead to forward the messages to relatives in Syria and other locations. The audio format was also well-received, as it made the information more widely accessible.

Wikaytek's success shows that not all solutions must be groundbreaking and technologically innovative; what's more important is to respond to the target audience's needs, understand their limitations, and cater to their well-being in the most concise and efficient way. Often, intervention seems obvious in retrospect, but in reality, it might never have been uncovered were it not for a thorough understanding of the community's behaviors. That, to me, is the beauty of design.



Wikaytek
SOHTEK B MAALOUIMATEK



IEEE AUB X INVESTMENT CLUB

WRITTEN BY ANTHONY TORBEY

PAVING THE WAY FOR
FINTECH LITERACY



With this phrase, Chris Skinner highlights the importance of acknowledging, understanding, and learning about the fintech revolution we are witnessing to be able to adjust to the new norm regarding financial investments. The two student clubs that are fittest to provide this knowledge to their members are the Institute of Electrical and Electronics Engineers (IEEE) AUB Student Branch and the AUB Investment Club. The IEEE AUB Student Branch and AUB Investment Club, two of the most active clubs on campus, have been collaborating to provide their members and AUB students with exciting and interesting events since 2020.

IEEE AUB was founded in 1997 as the first IEEE student branch in Lebanon and has been the biggest branch in the country ever since. What started off as a small community gradually grew to become a huge network of members and alumni. Their goal is to advance the IEEE mission and to create a community of people interested in different fields of technology and engineering, eager to learn, and willing to share their knowledge with others through workshops and competitions that allow them to develop their technical and soft skills. They are one of the most active clubs on campus and they currently have over 200 members registered in the club.

“IGNORING TECHNO-
LOGICAL CHANGE IN
A FINANCIAL SYSTEM
BASED UPON TECHNOLOGY
IS LIKE A MOUSE
STARVING TO DEATH
BECAUSE SOMEONE
MOVED THEIR CHEESE”⁹⁹

The AUB Investment Club was founded in 2013. It focuses on providing financial education for people who are looking to join the business world discussing topics including private equity, venture capital, and the economic situation in Lebanon. The club aims to equip its members with the knowledge and tools required to be able to better understand financial markets and investment strategies. This mission is carried through various workshops and competitions like the Virtual Stock Exchange Competition and the Forex Exchange Competition. What started as a small club with an average of 40 to 70 members per semester witnessed immense growth over the past few years, reaching a peak of 400 registered members last year.

The two clubs have worked together to organize many workshops, webinars, and events over the past 2 years. When asked why they decided to collaborate, Celine Dibo, the president of the AUB Investment Club and an industrial engineering student, says it felt “natural” to collaborate as both are active clubs with common members between the two. Furthermore, Georges Haidar, the president of the IEEE AUB Student Branch and a computer and communications engineering student, wanted to “create a dynamic student life especially since we were online” and “find a way to help people connect and learn about something new” while “helping students stay engaged in student life at AUB” through hosting the different events, in collaboration with the Investment Club, since 2020. Dibo also adds that interrelated topics of interest, mainly relating to the fintech world, between the two clubs encouraged them to host events

related to these topics. Everyone is witnessing the fintech revolution with the current boom in cryptocurrencies, blockchain, and the Non-Fungible Tokens (NFTs). The high attendance and demand for workshops discussing these topics are reflective of the fact that MSFEA students are interested in these topics. The main event of the Spring 2022 semester, delivered by AUB Investment Club cabinet member and civil engineering student Marwan Kazan, has been the series of 5 Cryptocurrency Trading workshops in collaboration with Alpha Trading. By offering Cryptocurrency Trading workshops the aim was to have something that “interests both sides of the coin”, says Dibo, as this is an area where topics related to both IEEE AUB and Investment Club overlap. The clubs originally hosted one workshop about Cryptocurrency in Fall, and after receiving great feedback they decided to expand and create a series of workshops to offer in the following semester as a complement to the ones previously held. The workshops come at a time when Cryptocurrency is booming with different currencies and platforms constantly emerging, thus, educating its attendees with knowledge on how to trade effectively with crypto was the main objective behind the workshops. People have also begun to invest in crypto in an attempt to diversify their portfolios from original securities and stocks and not place all their eggs in the same basket.

Therefore, acquiring financial literacy is essential to be able to understand the market and that is what the main goal behind the workshops is. In line with the clubs’ visions and motivators, they even made the workshops available to





everyone on YouTube for everyone to benefit and learn about the market in order to make more intelligent investments. Dibo believes that the workshops are

“CONTRIBUTING TO A NEED THAT IS PRESENT IN LEBANON AS PEOPLE DO NOT TRUST THE LEBANESE BANKS ANYMORE”

as the current different crises in Lebanon have pushed people to explore crypto.

This is a topic the Investment Club and IEEE AUB also collaborated on, and they have hosted many webinars with notable guests discussing the current unprecedented different crises Lebanon is facing. The first event they hosted regarding the crisis was in early 2020, before the pandemic hit, where they hosted Dan Azzi, AUB Alumnus and economic expert with a long career in banking all over the globe, to talk about the economic situation in Lebanon. Despite all club events being halted due to the pandemic, the clubs persevered to continue to host other notable guests such as Dr. Alain Bifani, the previous Director-General of the Ministry of Finance, to also provide his thoughts on the crisis in late 2020 and Dr. Charbel Nahhas, former Minister of Labor, to talk about the economic crisis in early 2021.

In addition to the technical workshops the clubs

provided throughout the semester, they also organized a two-series “Plan Your Road Ahead” workshop hosted by Dr. Rima Shaar, ex-Regional HR Manager for Deloitte, career advisor at the OSB Management Services, and Certified HR Consultant for the United Nations. The two workshops covered soft skills by explaining the art of CV and Cover Letter Writing and tips on how to ace a behavioral interview. When asked about why the clubs decided to deliver workshops that are not only related to the fintech world, Dibo says they wanted to “maximize reach by also offering soft skills workshops” and Haidar says they wanted to organize “workshops and events to help engage everyone and not only people who have interests in coding languages, programming,...”

Evidently, IEEE AUB and the Investment Club have collaborated in delivering various events in a multitude of disciplines which have been successful and popular amongst their members. Haidar hypothesizes that this may be due to the fact that the events “help them stay updated about what is happening in the world especially given the fact that they are covering topics that expand on the knowledge taught in the classroom” and the events offer them a way to learn more about these topics. When asked if they think the collaborations will continue between the two clubs, both Haidar and Dibo reiterated that they have received great feedback on the workshops and they both hope and believe that the collaborations will continue.



THE AUB CONSULTING CLUB

AND THE GOLD RUSH
FOR CONSULTING

WRITTEN BY ADRIEN KHOURY EL ARAMOUNI

When people think of an engineering fresh graduate, they might imagine a civil engineer building a shining glass skyscraper in the desert or a mechanical engineer designing the latest spoiler of a Formula 1 car, or a computer engineer writing the code for the next state-of-the-art algorithm that will power Netflix's recommender system. The last thing they'd expect is a business consultant in a suit giving them insight on how to streamline processes or increase sales or doing the due diligence on a potential merger. However, over the last couple of decades, a noticeable share of MSFEA's brightest students have been abandoning their drills, oscilloscopes, and drawing boards in favor of suits to start their careers in management consulting. Naturally, this has translated into an increased interest in the field on campus, making **the AUB Consulting Club not only one of the largest clubs on campus but also one that influences and is influenced by a large share of engineering students.** But why is such an apparently irrational move so popular and what is the AUB Consulting Club doing that is making it so popular?

Management consulting is the practice of helping organizations to improve their performance. It is a longstanding industry that started in the United States but gradually expanded throughout the world, including the Middle East. What started as a small practice with one firm gradually grew into a behemoth-like arena in which the world's most prestigious firms intensely compete for projects. **Firms like McKinsey & Company, Boston Consulting Group (BCG), Bain & Company, Strategy&, Kearney, Oliver Wyman and Roland Berger dramatically grew in size and recruited - and continue to recruit - heavily from AUB, with a large share of their fresh graduates coming from an engineering background.** These firms like engineers because their strong problem-solving skills and versatility allow them to think critically and come up with the optimal solutions to the complex problems business faces. For example, BCG's Global Chair Rich Lesser and Bain & Company's CEO Manny Maceda are both engineers by training. Conversely, students are attracted towards this corporate career for various reasons. According to Paul Frangie, an E4 student joining Kearney after his graduation, consulting is a "great way to get a taste of the business worlds and the various industries out there, which is a tremendous opportunity to get exposed to a wide array of different things and learn a lot early on."

Carl Etienne Chaaya, also an E4 student joining Kearney, adds that "consulting gives you an unparalleled and very exciting opportunity to work on massive-scale projects that are profoundly impacting the Middle East and driving impact forward like Vision 2030." Furthermore, Celine Dibo, an E4 student joining BCG, remarks that consulting is a job "that is well-suited for engineers because of the necessary analytical and critical thinking skills. The strong learning curve allows you to broaden your skillset and this opens a lot of opportunities down the line early on in your career like working in Fortune 500 companies in key strategic roles, which is something typically reserved for seasoned professionals." Last but not least, a civil engineering student joining Bain & Company full-time after graduation mentions the mix of technical and soft skills as a reason to join the field: "Although I love engineering, I don't see myself working in the field in the long term. Management consultants have a mix of both technical and soft skills; they incorporate both worlds into their daily routine. This, I believe, is the beauty of it, and it is exactly why I chose this career path."

This strong match between consulting firms and engineering students rapidly translated into an extremely competitive recruitment process cycle, with some firms closing application submissions a full year before the internship start date and using an exhausting multiple-interviews long process to pick a handful of candidates out of hundreds. However, the AUB Consulting Club (AUBCC) has worked to streamline the process and make it easier for students to break into the field.



AUBCC is one of the largest clubs on campus with 230 registered members and the leading reference for students going into consulting in the MENA region. The club aspires to help students by introducing them to the field, helping them network with consultants in top firms, providing insight and support on applications-related questions and preparing them for interviews. The club, which recently turned 10 years old, has a strong alumni base spread out across the different firms in the MENA region but also in the US and Europe. Each semester, the club organizes a multitude of workshops, talks, and other activities to help students get acquainted with the field and prepare them for the recruitment process.

The club organizes key workshops that have become yearly traditions: the CV and Cover Letter (CL) workshops to help students craft the best CV and CL possible to boost their chances of earning an interview, the fit workshop to help them prepare thoughtful answers for behavioral questions that come up in interviews, and the case-solving workshops trilogy to introduce them to business cases and how to solve them which is a central part of all interviews. Rachel El Hajjar, an E3 student and incoming intern at BCG, mentions that

“THESE WORKSHOPS ARE KEY TO UNDERSTANDING WHAT CONSULTING IS ABOUT AND HELP YOU STAND OUT IN THE PROCESS AMONG AN EXTREMELY COMPETITIVE POOL.”

In addition, the club has worked hard over the last two years to introduce multiple initiatives. The first one is Beat the Case. Michael Torbey, an E2 student and the co-founder of the initiative, defines it “as a weekly case-solving challenge where students have a week to solve a small business problem like those they might face in real interviews. It’s a great way to practice critical thinking and case solving skills.” Lea Ballan, the other co-founder, makes sure to add “it’s a great opportunity that also comes with rewards like mock case interviews with cabinet members, chats with consultants in the industry, and a direct ticket to the second round of the AUBCC Case Competition.”

This is the second initiative which was introduced last year. According to Danielle Saleme, a club cabinet member and one of the architects behind the initiative, “it is a formal competition for candidates to further practice case-solving skills. The winner is awarded a first-round interview with the respective consulting firm. The first edition was held in 2021 with Bain & Company and we’re very happy to be bringing it back for 2022 with another leading firm. It’s a great way for people to practice their skills in a fun yet competitive environment and seriously prepare before actual interviews.” The third initiative is the website. Spearheaded by Elie El Khawand, an E4 student joining Bain & Company, it serves as a great repository and central database for people to know about the club, join it, and find useful resources. The fourth initiative is the casebook. According to Georges Haidar, an E4 student who interned at BCG, a casebook is “a key resource for anyone to practice ahead of their interviews and the club is very happy to introduce its own casebook, a first in the region, that is designed and tailored for the Middle East recruitment specificities.” The club also introduced other initiatives like a buddy system (for people to find case-solving partners), a monthly newsletter, partnerships with other clubs to host panels, and Instagram Live chats with consultants from various firms for them to share their experiences in the field.

All of these efforts have proven of tremendous help to students who now see the AUB Consulting Club as a go-to reference for anyone wanting to join the field. As the field continuously expands in the Middle East and beyond and increasingly becomes more and more attractive to engineering students, the “Gold Rush” for consulting hardly shows signs of slowing down anytime soon.

NAVIGATING THE POST-COVID STUDENT LIFE

WITH THE SRC

WRITTEN BY MAHMOUD MABSOUT

After nearly 2 years of online learning that saw lively classes turn into Zoom meetings and daily conversations with friends outside Bechtel transform into distant WhatsApp messages, the student body was very excited to be back on-campus. For some, it was a return to good old times filled with cherished memories whereas, for others, it was the beginning of a completely new experience. However, one of the biggest signs that the campus is buzzing again and full of life is undoubtedly the return of on-campus student activities and the increased involvement of the Student Representative Committee (SRC). This is echoed in the words of Jad Issa, fourth-year Industrial Engineering student and the President of the SRC: The SRC's work during the pandemic was limited to following up with Professors on issues like exam proctoring, monitoring, and helping to boost mental health,... but not much was done when it comes to initiatives and events. So we're very happy to be back on campus and able to have an impact on the students and the MSFEA community.

Hence, in that spirit, the SRC has worked hard to enhance student life and try to mitigate the nefarious consequences that the country is struggling with by designing and implementing several initiatives:



Musical Thursdays

One unequivocal request of students after their return to campus was to hold lively events where students could socialize and get to meet each other. In that vein, live musical performances by talented students were hosted at T Marbouta, the shared eating space right next to the IOEC building. A big musical event was also organized in late April in collaboration with OSB's SRC. This was an opportunity for students to unwind and take a small break while having lunch and enjoying the music and energetic performances.

Social Impact

In order to alleviate some of the economic and financial burdens on disenfranchised households, a three-day bake sale was organized. The SRC sold a wide array of cookies and pastries for modest sums to students passing by IOEC. The money collected was used to support households in need all across Lebanon in the form of food donations. The committee has secured the food boxes that will be donated and is currently looking into the households they plan to visit and help.

Facilities

After many complaints by the student body concerning the lack of adequate space and equipment for them to heat their food, the SRC worked closely with Mr. Mohamad Khaled Joujou, the Assistant to the Dean for Operations, to provide students with two microwaves. They are now available in the bar area in T-Marbouta, with the staff there taking care of cleaning and maintaining the microwaves. Furthermore, after a long negotiation process, the SRC was able to reopen the IOEC gate, which has been closed ever since the start of the COVID-19 pandemic. This is great news for students who come to and leave campus from the IOEC building, saving them the trouble of going to the OSB or Hostler gate to access campus.

Contribution to USFC proposals

The SRC closely collaborated with the University Student Faculty Committee (USFC) on three proposals. The first pertains to the implementation of a "Heat Map" system. This system allows professors and instructors to track the overall workload distribution of students and thus allocate students' dues efficiently that not only minimizes overlaps but also allows students to maintain balanced deadlines. The second proposal revolves around the formation of a committee to revise the current Instructor Course Evaluation platform, and suggest changes. This aims to enhance the current evaluation process in order to help Professors better identify areas of progress and for students to voice constructive criticism in an efficient way.



Last but not least, the SRC is supporting the USFC on a proposal that aims to introduce separate certificates for minor completion which currently only appear on transcripts and not on diplomas.

Internship Hunt

In light of the dire economic circumstances in Lebanon and the wide array of complications introduced by the COVID-19 pandemic, a lot of students have struggled to find internships in the summer of their third year, which is a required experience for them to graduate. Consequently, the SRC conducted a survey among E4 students and AUB alumni to gather data about the internships they completed. This is done in the hopes of forming a comprehensive database that will make incoming E3 students aware of a multitude of opportunities that complements those broadcasted by the MSFEA Career Development Center. This survey will remain open so that new data can continuously be added thus enlarging the database!

Reinitiating the Student Advising Office

After a two-year hiatus due to the COVID-19 pandemic, the SRC was proud to revive the Student Advising Office. This office, which was launched in 2019, aspires to help students with any worries or questions they might have about registration, courses, and many other topics. The office is led by E3 and E4 students who know the system well enough and thus can help fellow younger students navigate through their problems. The SRC picked exemplary students from across all faculty departments to fill the office throughout the week and ensure that, at almost any time throughout the week, a student is available to help answer any questions.

Academics

After gathering interest from enough students, the SRC collaborated with the Registrar to open sections in some courses during the winter session. The committee is also following up on the new course registration system which was introduced in Fall 2021 and is looking into ways to improve it ahead of the new academic year. In addition, on multiple occasions, the SRC served as an intermediary between students and professors to voice the students' concerns and requests and try to resolve any disparities as transparently and efficiently as possible. Lastly, the SRC also worked on providing students listed on the Dean's Honor List with a virtual certificate that commemorates the students' achievements.

Big Games

A longstanding faculty tradition and one of the highlights of the year, the Big Games is a series of sports games that pit the Faculty of Engineering and Architecture against the Faculty of Arts and Sciences. Unfortunately, it couldn't be held in the last 2 years due to the COVID-19 pandemic. However, after the return to campus, the SRC worked hard to bring this tradition back and, against all odds, the 131st edition of the Big Games was held on April 27, 2022. Attended by the university's leadership, including President Fadlo Khuri, Provost Zaher Dawy, Deputy Provost and Interim Dean of Student Affairs Lina Choueiri, and Vice President for Advancement Imad Baalbaki, the event was a great success. The audience, packed in the stands of the Green Field, not only had the pleasure to witness a 2-0 win for the MSFEA team but also an energetic cheerleader performance.

Stand-up Comedy Show

The MSFEA SRCs, in collaboration with the Rotaract Club, hosted a stand-up comedy show featuring Lebanese comedians Wissam Kamal, Nicolas Tawk, Chaker Bou Abdalla, and Ahmad Seifeddine. Besides giving AUB students a good laugh, this event also serves a great cause, as it was a fundraiser for two Lebanese NGOs: Nation Station and Be Brave.



Looking at all of this work, one cannot refute the SRC's commitment to improving student life. As Issa mentions, "being part of the SRC was a very fulfilling experience that motivated me to give back to the AUB community. We really worked hard over the year and we think we did a good job. We hope students appreciated all the initiatives and events." This is echoed in the words of Karim Abdo, fourth-year Mechanical Engineering student and also part of the SRC: "becoming a student representative was an opportunity to create impact by bringing forward new initiatives, policies, and processes at AUB. We aimed at enhancing the extracurricular activities and academic experiences of our peers, all while reintroducing bonding events." While the country is going through some of its darkest times, watching the SRC doing their best to make the campus as lively as it has ever been is truly heartwarming, with the hope that next year's MSFEA SRC will build on this legacy.

BUILD IT WEEKEND 4.0

CREATIVITY
DESPITE

WRITTEN BY GEORGES HAIDAR



The COVID-19 pandemic and the economic and financial chaos in Lebanon might have had the better of a lot of initiatives at AUB and beyond, but one event that, despite everything going on, came back in full force after a forced two-year hiatus is the Build It Weekend.

A 48-HOUR HARDWARE HACK-ATHON CO-ORGANIZED BY THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE) AUB STUDENT BRANCH AND THE AUB ROBOTICS CLUB, BUILD IT IS A FLAGSHIP EVENT THAT USED TO GATHER ENGINEERING AND HARDWARE ENTHUSIASTS

from all over Lebanon for a fun yet competitive event where they had to design and build a project centered around a certain theme over a weekend. And while things did change for the 4th edition of the event, which happened on April 8, 9, and 10, 2022, this didn't stop the two student organizations from pulling off an amazing feat.

Once the academic year kicked off and the gradual return on-campus started, both student organizations wanted to bring back the event which had unfortunately been canceled at the very last minute in March 2020 because of the onset of the COVID-19 pandemic. However, there was a mountain of challenges to overcome. As Hani Al Jamal, a fourth-year ECE student, the President of the AUB Robotics Club, and the main architect behind the event explains, there were a billion obstacles to overcome. The first step was to secure the funding because we knew that, without any financial support, we couldn't even dream of buying the components needed for the event, let alone pay for the rest.

After a long and tedious search, the student-led team was able to secure the required funding. The two student clubs, with the help of their advisor Dr. Imad Elhajj, were able to secure partial funding from the MSFEA Dean's Office which saw in Build It Weekend a great initiative that promotes the true spirit of engineering. The rest of the funding was secured from the student clubs' accounts and external sponsors (Beirut ElectroCity and the SKILD center). Once the funding was secured, a long journey began in order to straighten the logistics for the event. As Georges Haidar, a fourth-year CCE student and the President of the IEEE AUB Student Branch mentions, "[we] had to redesign the whole event to accommodate for operational changes and lab opening hours at AUB because the post-COVID rules prevented us from allowing students to stay on campus 24/7, which was the norm for previous editions of the event." Furthermore, the team had to find a way to accommodate for an iftar to be arranged at night given the event fell during the Ramadan period. Despite the time crunch and the complicated system the student team had to navigate to secure approvals, they were able to straighten everything in time. The floor was set for one of the most memorable events of the year.

Build It Weekend 4.0 kicked off on Friday, April 8, with a ceremony to introduce the 4th edition's theme "Creativity Despite" which was inspired by the current circumstances in the country. 37 builders, spread out across teams, were given \$60 worth of components to build a project of their own. The plan was straightforward: Friday to come up with an idea and a rough sketch of the design process, Saturday to bring this design to life by using the components given to them and leveraging the state-of-the-art facilities and labs of MSFEA, and Sunday to finalize the projects before presenting them to a panel of 3 judges: Dr. Youssef Tawk (ECE Department), Dr. Samir Mustapha (MECH Department), and Mr. Ali Kanso (ECE Department). This event was not only an opportunity to channel the classroom knowledge into the real world but also a chance to compete for monetary prizes worth \$6,000 (to be credited towards the winning teams' tuition).



After 2 days of intense building, projects were ready to be presented to the panel of judges on Sunday afternoon in the IOEC L6 Graduate Room. Each team walked all judges through their project, the idea behind it, and the implementation details in addition to a demo. Furthermore, the judges asked each team a series of questions that gave the team members the opportunity to expand on their idea and on how it could be developed further. After the judging phase, all teams headed to the Engineering Lecture Hall for the closing ceremony where the 3 winners were announced. The team that won first place, "Bionic Hand", built a mechanical hand that mimics the movement of a real hand which is captured in real-time via a camera. "K.A.H.A.," the team that took home second place, built a healthcare-oriented alarm-based device that allows its user to set reminders and receive alerts via Bluetooth to take medications at pre-set times throughout the day. Team "Tuners," which took third place, built a wheelchair that moves based on a sensor that tracks eye motion. While some projects were still unfinished by the end of the building phase, judges were impressed by the drive, enthusiasm, and capabilities of students to build the projects they saw, especially given the fact that they only had a weekend and that this probably was their first hands-on engineering experience after 2 years of online learning.



But the fun didn't stop at the participants' only as the student organizers themselves found the event equally entertaining. As Christie Berchan, a Computer and Communications Engineering student and part of the Robotics Club, says:

“I WAS PART OF THE **LOGISTICS TEAM** WHICH OVERSAW COMPONENT DISTRIBUTION TO THE MEMBERS. I HAD A LOT OF FUN DURING THE **EVENT** AND SPENDING SO MUCH TIME WITH THE REST OF THE TEAM REALLY BROUGHT US MUCH CLOSER TOGETHER. BUILD IT WAS ALSO **A GREAT LEARNING EXPERIENCE**. BY ASSISTING THE DIFFERENT TEAMS, I LEARNED A LOT ABOUT THE DIFFERENT COMPONENTS, HOW THEY WORK AND HOW THEY ARE RELATED TO EACH OTHER.”

Despite all odds, the team of 30 students behind the Build It Weekend was able to pull off an incredible event that not only reignited the love of hands-on engineering and practical thinking across the student body but also received praise from the faculty members, including Dean Alan Shihadeh. The Build It Weekend vfrom the faculty and beyond, it is also a love letter to the curious little children in every student and a testament to the values and mission MSFEA stands for.

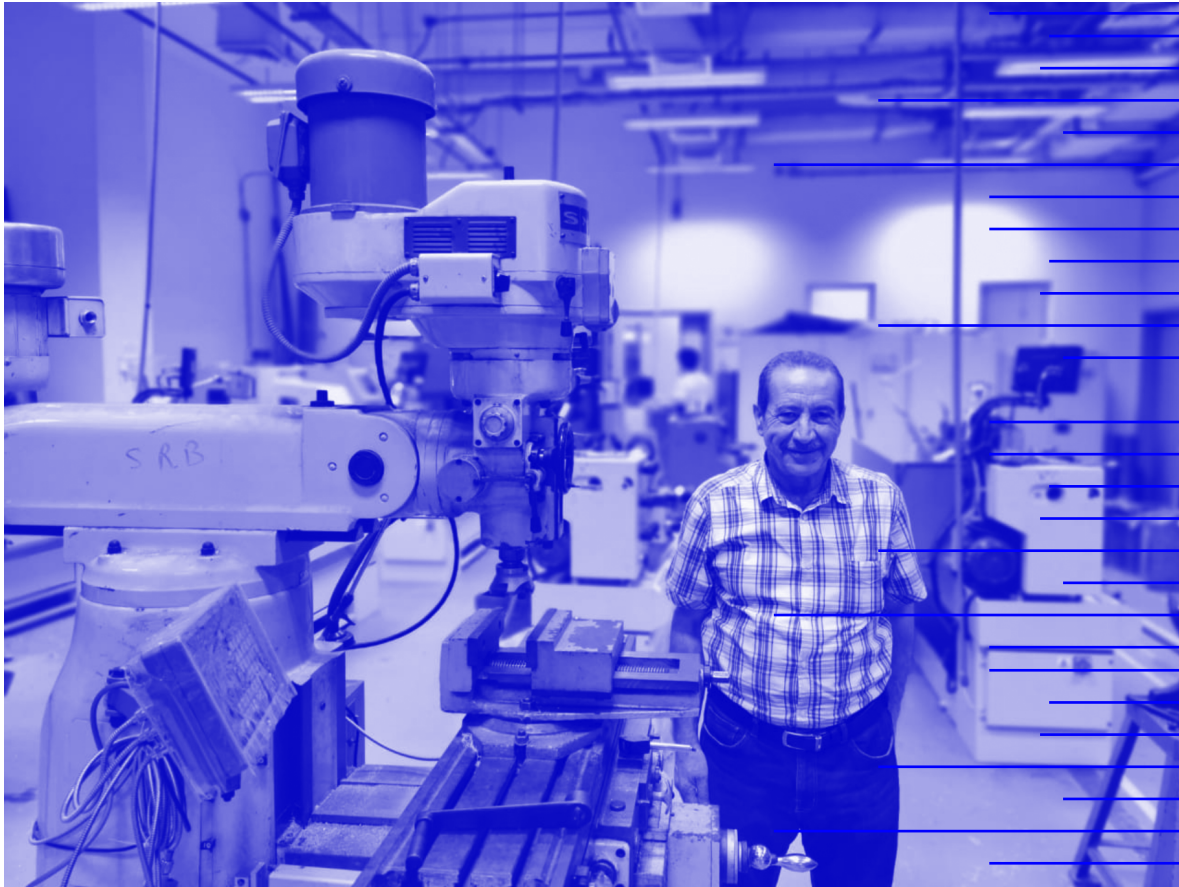


SPOTLIGHT

MASTER OF MSFEA SHOPS

AN INTERVIEW WITH
MR. JOSEPH NASSIF

WRITTEN BY GEORGES HAIDAR



If you enter AUB from the Main Gate and walk straight into the corridor that separates the College Hall in half, you will notice, to your left, a series of golden plaques. These plaques honor the recipients of the President's Service Excellence Award, an award designed to recognize the most outstanding people in the AUB community, those who go above and beyond to serve the university and push its mission forward. And if you look at the year 2005, you will notice the name of a man recognized by everyone in MSFEA, a man who has been the beating heart of the Scientific Research Building (SRB) for the last 43 years: Joseph Nassif.

One of the long-standing members of the AUB community, Mr. Joseph Nassif joined AUB's Physics department in 1979 as a lab technician. Fast forward 43 years, and counting, and he is now the supervisor of the SRB labs and workshops. Managing a team of 6 people, he mainly works with professors and students to help them implement their projects and make them come to life through a variety of machines and stations. "I've been here a long time" he says with a smile on his face, reminiscing all the stories that are coming back to memory after such a rich experience at AUB.

"I started in the Physics department in 1979 and stayed there for a little more than 8 years before moving to the Faculty of Engineering and Architecture in 1988. I originally started in Wing B [a now defunct building that has been replaced by the Irani Oxy Engineering Complex (IOEC)] before moving to SRB, which is where I still am present today. The switch to FEA was definitely a turning point for me. I felt increasingly trapped in a routine in my role at the Physics department with little room for self-improvement but everything changed once I moved over here." Despite not having an engineering degree, **Mr. Nassif tremendously values education and the importance of continuously learning to improve oneself, something he's been striving to uphold for a long time:** "I used to attend courses at AUB like "Manufacturing Processes" as well as training sessions abroad like in the US in order to learn new techniques and new methods that are crucial to help me in my job. Given the nature of what I do, I have to continuously learn to stay up to date and know how to use the newest and most advanced machines." This mentality is also reflected in the progress of the SRB workshops. The constant arrival of new machines over the years not only increased the capabilities and output of the faculty's workshop

but also positioned it as the best in the country, a great achievement in which Mr. Nassif takes a lot of pride: “we added a lot of machines over the years: Computer Numerical Control (CNC) machines, laser-cutting machines, Electric Discharge Machines (EDM) for wire-cutting, and recently a hot wire foam cutter just to name a few. All of this allowed us to expand our capabilities and output and be the best workshop in the country.”

When asked about what he likes about his job, Mr. Nassif’s face instantly lights up: “I love what I do. My father was a carpenter and I’ve worked with him from when I was as young as I can remember.

“I’VE ALWAYS LOVED MACHINES AND I’VE ALWAYS BEEN GOOD AT MATH AND GEOMETRY, WHICH ARE ESSENTIAL PARTS OF THE JOB ESPECIALLY WHEN IT COMES TO VISUALIZATION, TAKING MEASUREMENTS,... IT HAS BECOME A SECOND NATURE FOR ME.”



This love and dedication radiate from Mr. Nassif’s work. He is the go-to person when it comes to any piece of hands-on work at the SRB workshop: “I help a lot of students implement their projects for certain courses but also work with faculty members. **I worked with Dean Alan Shihadeh before he became Dean of MSFEA on a project related to his Aerosol Research Lab as well as with the Mechanical Engineering Department on a water channel project.**” In addition to that, Mr. Nassif’s work does not stop at the faculty and extends to AUB as a whole: “Back during his tenure, President Waterbury brought me authentic cedar wood and asked me to craft rings out of the wood. They were gifts intended for the Board of Trustees.”

All of this stellar work has, of course, not gone unnoticed, with Mr. Nassif winning the President’s Service Excellence Award in 2005: “It was a great morale boost and a recognition of my abilities. I was very happy and humbled to win this award.” Mr. Nassif also has a lot of admiration for MSFEA and AUB: “My relationship with the university doesn’t stop at me. Both my sons are graduates of FAFS. One studied agriculture engineering and the other landscape architecture.”

When asked if he would advise young aspiring engineers and architects to join the faculty, his response is unequivocal: “Definitely! **The faculty has great professors, great leadership, and great facilities. It has improved a lot since the 1980s and I’m sure that, despite everything that’s happening around us, it still is the best place to be at.**”

Mr. Nassif’s work and dedication can only be admired so, on a parting note, we asked him if there is a quote that motivates him to always bring the best out of himself to which he answered: “Not particularly but I absolutely do believe in the importance of being a clean and honest person, work hard and maintain a good reputation.”



THE WORLD IS YOURS

WRITTEN BY LYNN BAZZI

IN AN AGE WHERE THE YOUTH IS BECOMING INCREASINGLY AWARE OF THE **POLITICAL, SOCIAL, ECONOMIC, AND CULTURAL SITUATION** AROUND THEM, BACHAR SHLASH AND HIS CO-HOST LEO KHOURY, HAVE CREATED A PODCAST TITLED **"THE WORLD IS YOURS"**.

As Bachar puts it "the title is pretty self-explanatory. We wanted to see the world through different people's perspectives, mainly experts' perspectives. **We wanted to be a part of people's routine and create a platform that is both a mix of information and fun**".

Bachar and Leo wanted to go out of the typical news format that we see on TV, which frankly speaking no one watches anymore. "We see it as a very cringey talk show that is only meant for the older generation and that does not appeal to the youth." For this reason, they wanted to create something specifically targeted toward the youth, something almost unheard of in Lebanon where media is a very niche and dry market.

When asked what exactly made them want to implement the project, Bachar replied that he and his friend always have very dynamic conversations and thought that these ideas would make great talking points. However, their main driving force was the misinformation they observed in their surroundings. And this is how the idea of their podcast was born.

Although in the conceptual stage for almost a year, the project has only seen daylight in January of this year. Of course, every project comes with its hardships, and Bachar and Leo were not spared.





Indeed, they were set out to post an episode every 2 weeks, but they have been highly delayed because Leo had contracted COVID19- which forced them to take a sabbatical. Bachar assured me, however, that they are coming back stronger than ever and will publish highly interesting episodes starring none other than AUB President Fadlo Khuri and activist and writer Joumana Haddad.

When asked about his relationship with the prospect of failure, Bachar simply said: "I was never really afraid to fail. Of course, we made tremendous mistakes throughout, from editing to topic choices. Moreover, before launching our first episode we realized we were highly underequipped, so a lot of time had to be spent fixing that. We also needed to figure out how each of us would react when faced with a guest, and to do so we had to do rehearsals with friends who gave us pointers and helped us correct our mistakes. Despite all of these mistakes and missteps, we were not afraid to fail because everything in life is a process. I would go as far as to say that I am grateful for the mistakes we made. They helped us shape an even better project than what was first envisioned."

For anyone planning to pursue a similar project, Bachar explained that it would take time and a lot of effort to do so. Indeed, for "The World Is Yours" a significant amount of time was spent trying to find good quality equipment and softwares. Moreover, they had to figure out their marketing design, something they are no experts in.

For this reason, Bachar said that they had to ask for the help of various people who helped them figure out their branding. This was entirely done before they launched their first episode. When they did eventually launch, they had to think about topics that would be interesting for them to talk about and for the public to listen to.



More importantly, Bachar emphasized the hardship that is getting experts on the show, many do not take them seriously or do not have time to appear on the podcast. This obviously set them back significantly.

Despite all of this work, their podcast is on a constant improvement basis. "Honestly, looking back at the first episode, I wonder how we even released this. It's always a work in progress, we have to always enhance. The reviews keep getting better obviously. I get a lot of friends that give me constructive criticism, you need to keep in mind that there is always an element of tension that is the camera. But yes, we are a work in progress and each episode gets better than the other and gets way better criticism than the previous one."

Bachar concluded by saying that his main piece of advice to anyone who is starting a project or who might be too scared to go for it is perseverance. "Realize that you are doing it for you, don't think about people hating on your project, if you believe in it go for it."

A PASSION, A WAR, AND A NOBEL PRIZE

ARDEM PATAPOUTIAN'S
ACADEMIC JOURNEY

WRITTEN BY JANA WEHBE



“LIFE WAS OFTEN UNDERSTANDABLY **STRESSFUL**, WITH CURFEWS, LIMITED HOURS OF ELECTRICITY, AND THE NOT INFREQUENT EXPLOSION.”

During the time to which Dr. Ardem Patapoutian was referring in his statement, when he personally experienced one of two war-related conflicts that occurred in Lebanon during his lifetime, **little did he know that he was going to be a recipient of the Nobel Prize, shortly after going through an inspiring academic and life journey.** As of October 2021, AUB former student Ardem Patapoutian becomes the first AUB alumni to win a Nobel Prize, specifically in the field of physiology and medicine, for his discovery of “biological receptors for temperature and touch” that can revolutionize detecting and curing diseases.

and positive learning environment, where he described that working as a team and contributing to a meaningful project, “proved to be addictive”. Alongside meeting new mentors, developing new interests, and expanding upon his knowledge, Patapoutian significantly treasured smaller parts of his life, such as his colleagues, his hobbies, and his ability to practice and work on his passion for science. Patapoutian mentions that it was during this time that **he “fell in love with research”, which also “changed the course of [his] career”.**

Patapoutian's academic journey began at a young age, despite his claims of being a “late bloomer” with regard to his love for mathematics and science. He, later on, applied his love of learning in chemistry, medicine, and science-related studies when he joined the American University of Beirut in 1985, where he was placed on the dean's honor list. Then, when he moved to Los Angeles, he familiarized himself with the laboratory atmosphere, stating that the experience was an unpredictable

Although his career path led him to various parts of the world, Patapoutian mentions that AUB and Lebanon were home to all of his “havens of childhood” and were the places where it all started. Patapoutian was born in Beirut, Lebanon, where the majority of his childhood, as he mentioned, was tied to memories of the beautiful scenery, trips to the Mediterranean Sea, and the “wooded mountains” surrounding Beirut, developing what he now refers to as the “wonderful years” he spent in Lebanon. Despite it all, when Patapoutian was around 8 years old, the Lebanese Civil War began, making living conditions harder for all Lebanese citizens including Patapoutian's family. This was portrayed by his frequent school-switching and decreasing attendance in his classes as other families fled the country.

This experience was not so unfamiliar when Patapoutian started university, where the arising conflict caused him to leave the country after he was “captured and held by armed militants” - an experience Patapoutian understandably describes as “fateful and terrifying”. It was also the same experience that caused a gap year in his studies, due to his family being unable to provide funds for his university tuition, where he resumed his academic career the year after.

Prior to receiving the Nobel Prize in October 2021, Patapoutian received various awards and honors with regard to his valuable research and work in his field. His awards included the W. Alden Spencer Award in 2017, the Rosenstiel Award in 2019, and the Kavli Prize in 2020. After his discovery that resulted in the Nobel Prize win, **Patapoutian received the American Academy of Achievement's Golden Plate and was also awarded the Lebanese Order of Merit in October of 2021.**

“I don't want to change my lifestyle or get special treatment. I just want to keep going to the lab and continue doing what I do.” Patapoutian's overall academic journey was a great inspiration for aspiring researchers, scientists, professors, and students as he mentions the importance of following one's passion and doing what one loves. As surprised as he was when receiving the Nobel Prize, he emphasizes the significance of his work despite all the awards and types of recognition, since he genuinely cares about his research, and is grateful for the process that led him to pursue such a career. Patapoutian truly believed that there were various other people out there that deserved to receive such a prize, referring to his surprise post-win since his hard work and dedication were not for the purpose of its recognition, “it's not the point of science.”

However, receiving these awards significantly shows his passion for medical or scientific research, as he frequently talks about the beauty of “the intellectual nourishment” accompanying his career.

“THE RICHLY DIVERSE UNIVERSE OF CO-CONSPIRATORS, THE BEAUTIFUL PLACES AROUND THE WORLD WHERE SCIENCE HAS TAKEN [HIM], THE WONDERS AND MYSTERIES OF THE HUMAN BODY – WHAT JOY, WHAT FORTUNE.”

FIGHTING CLIMATE CHANGE: ELSY MILAN

WRITTEN BY JANA WEHBE

It's the youth that has the power and ability to create a better future for our environment and living conditions overall.

This idea was greatly emphasized by AUB student and environmental activist Elsy Milan, when asked about her overall perspective on the topic that she passionately pursues in her studies and career.

AS SHE SAYS, THE FIGHT FOR CLIMATE CHANGE IS THE **"FIGHT FOR A WORLD MORE EQUITABLE"**, AND ALONGSIDE ALL THE THINGS SHE HAS LEARNED THROUGHOUT HER JOURNEY, **ELSY REFUSES TO LOSE.**



Elsy represented Lebanon at the preCOP26 summit in Milan, Italy, preceded by the Youth4Climate event, joining hundreds of young activists and leaders to exchange views on some of the most significant climate change-related issues present in the world today. Elsy's impact, representation, and experience that resulted from attending this conference was the outcome of her noteworthy research under AUB Assistant Professor Kassem Ghorayeb, in which she explored the benefits of decarbonization as opposed to renewable energy, specifically carbon capture, utilization, and storage.

In addition to her research with Dr. Ghorayeb, Elsy was chosen by Dr. Alissar Yehya to assist in managing a new initiative Sustainable Engineering and Lifestyle (SEnLI), an initiative with the aim for engineers to think more eco-effectively. This experience provided Elsy with a mentor, Dr. Yehya, who further influenced and enhanced her career, being another woman in STEM that is passionate about the intersection of engineering and environmentally friendly solutions.

Elsy mentions the importance of her research in providing her with a "huge boost" at the tables of the events she attended, and how it prepared her for this type of high-level conference, alongside some AUB figures and their influence, such as Dr. Alan Shihadeh, Dr. Najat Saliba, and the Issam Fares Institute for Public Policy. Elsy was also named the co-facilitator of the Financial Flows Working Group for sustainable recovery. As portrayed by her extensive research and knowledge about the subject, she states, **"trusting the science is true, and while hugging trees is encouraged, technology all over the spectrum of the energy transition should be endorsed!"**

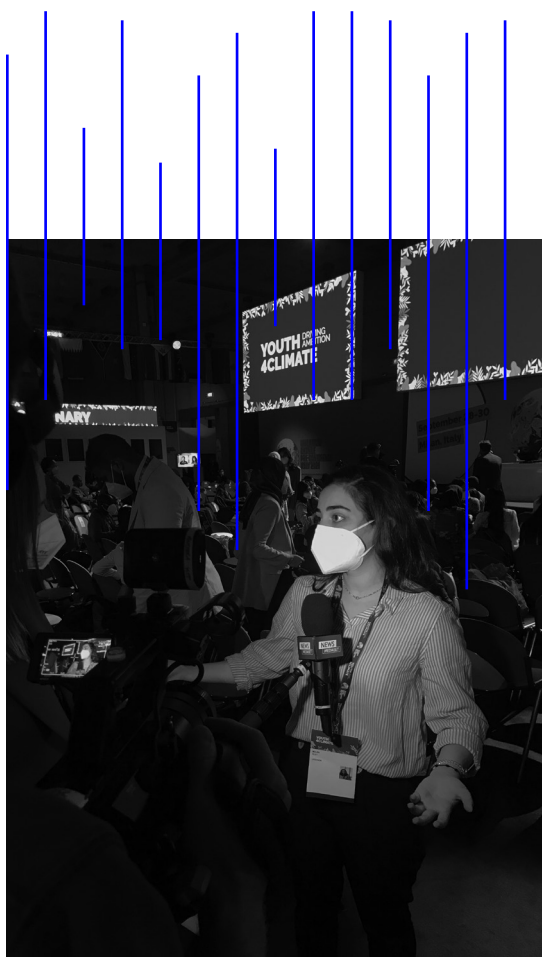
In terms of her studies, after pursuing chemistry in her undergraduate career at AUB, Elsy chose to study chemical engineering for her master's degree in order to tackle one of the biggest problems in the current world: the world's energy problem and transitioning from the use of fossil fuels - a topic that spiked her interest in chemical engineering during her undergraduate career. With her passion for her cause in mind, Elsy provided herself with the necessary background to work on energy transition and environmental security by choosing her courses to align with energy, including optimization, petroleum, sustainability, and renewable energies.

For Elsy, it does not stop there, as she incorporates her interests and passions into her extracurricular activities as well, **joining clubs like the AUB Red Cross Club, the Chemistry Student Society, and the Outlook team as an Arabic Column Writer, in addition to being a part of the AUB Latino Dance Club and the Music Club.**



Some of her volunteering experiences include working alongside the Children's Cancer Center, the Nature Conservation Center, and the AUB Events unit. Elsy effectively used her surrounding resources, as she mentions the enriching experiences she has had at MSFEA and AUB in general, where they helped her land four internships at the regional and national level, such as GreenPeace MENA, LOGI Energies, and more. She mentions that these experiences "fostered her love for advocacy, policy, and the energy transition." Even after the negative impacts of the worldwide pandemic, Elsy states, **"I refused to lose my focus, and took advantage of all resources provided by the faculty to learn and grow!"**

For the aspiring leaders, researchers, or advocates, Elsy emphasizes the importance to embrace failure, surround oneself with the right people, and fight for a right cause. "I don't believe in competition, I believe in cooperation."

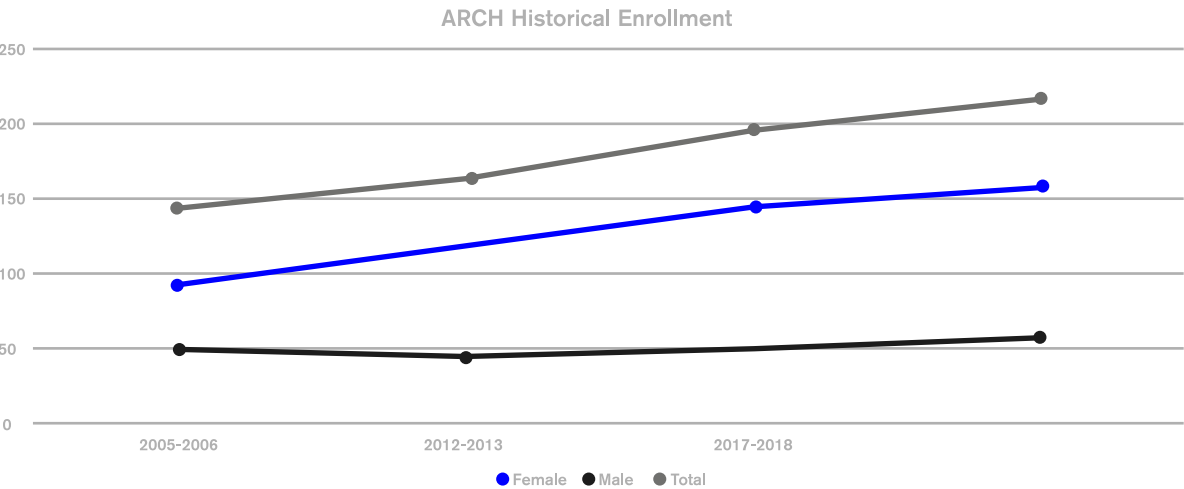


WOMEN IN ENGINEERING

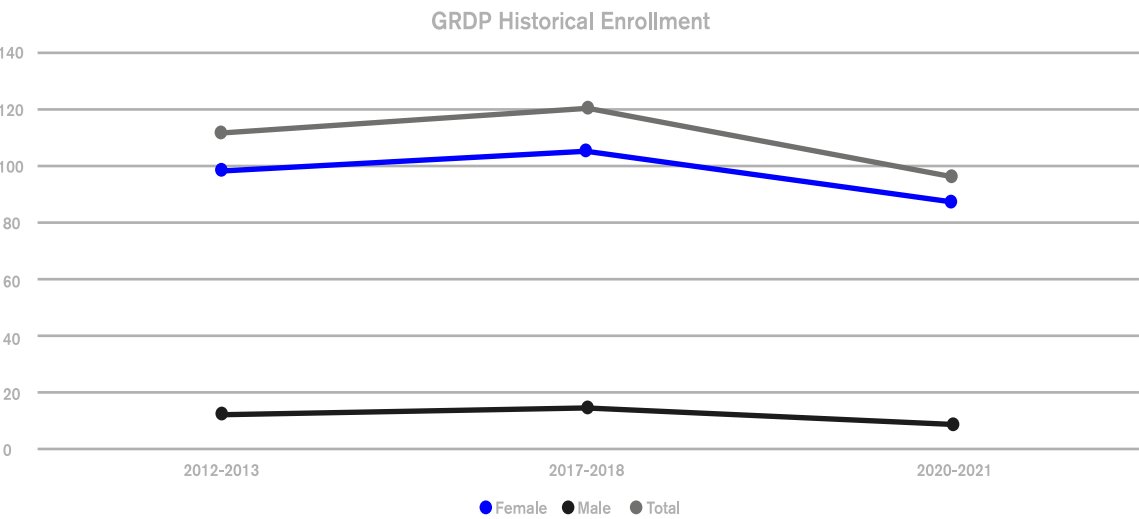
ENROLLMENT AND EMPLOYABILITY DATA

WRITTEN BY CELINE DIBO

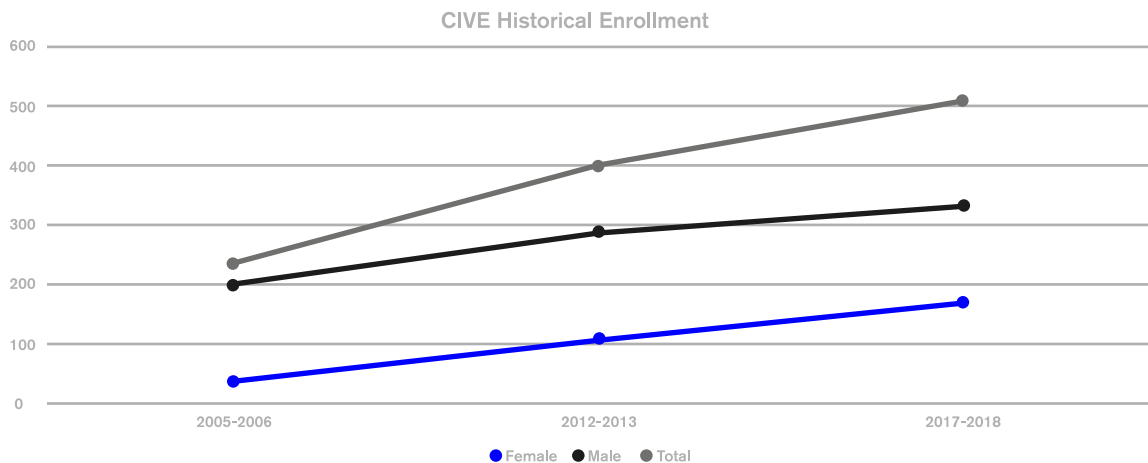
Architecture has been consistently attracting more women over the years



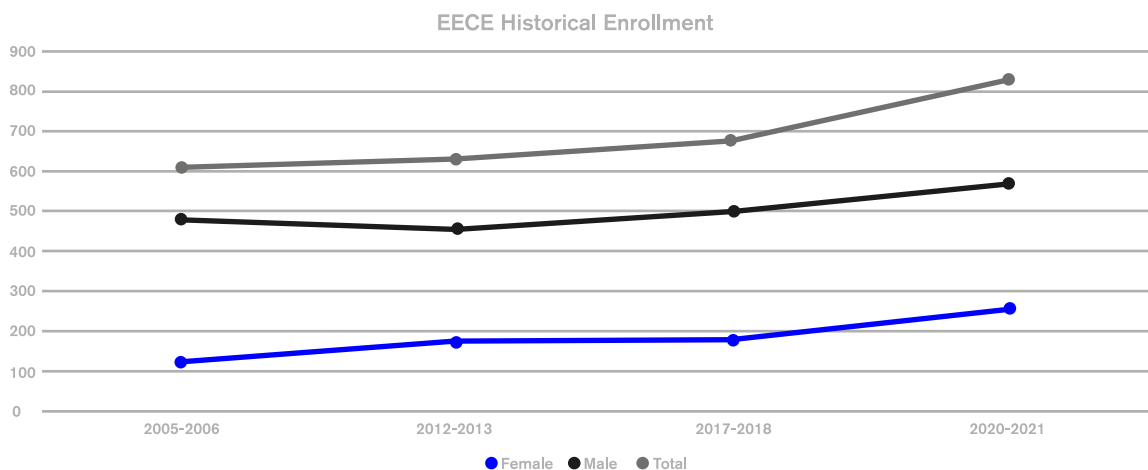
Graphic Design presents similar trends in terms of enrollment, with an even larger gap



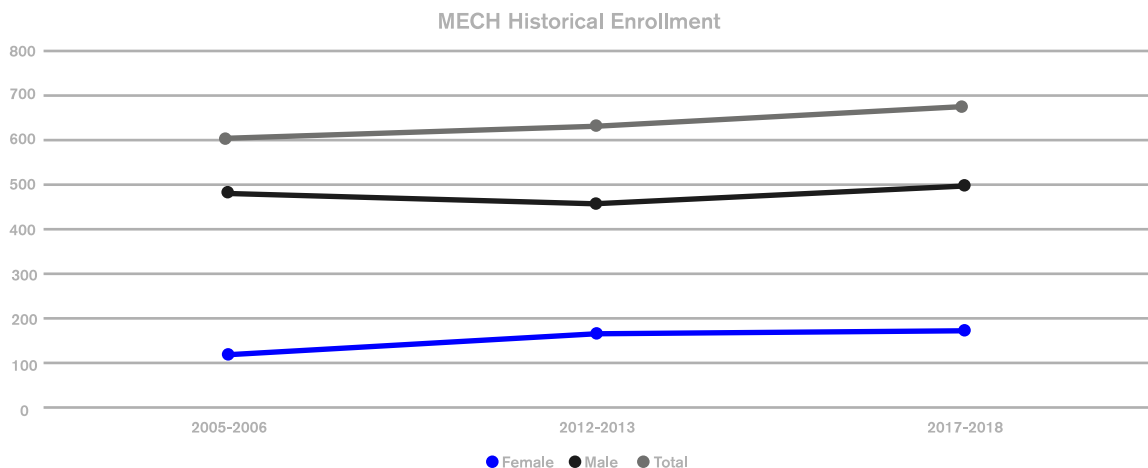
Over the years, the gap between men and women in civil engineering has consistently decreased



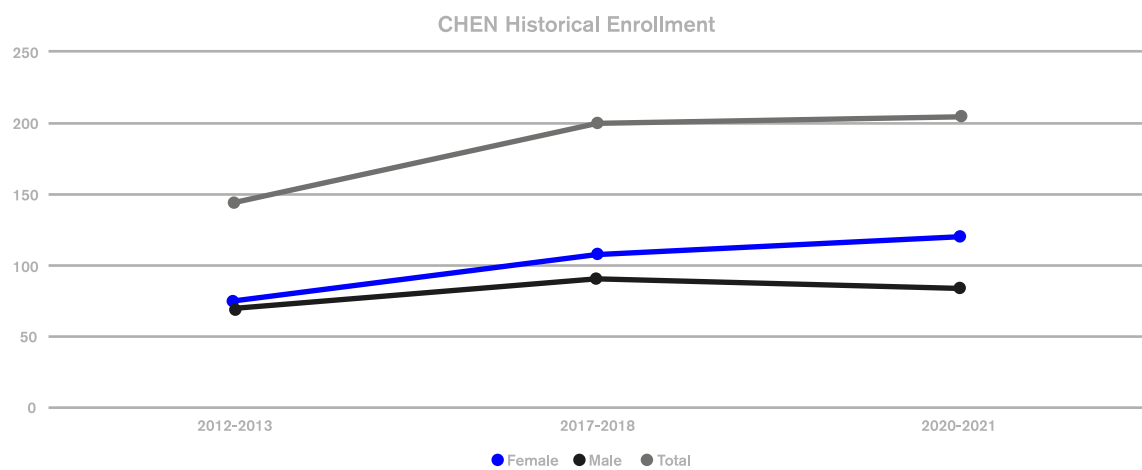
As two of the most established engineering majors at AUB, little change has been witnessed for CCE and ECE majors, with steady rates after 2010



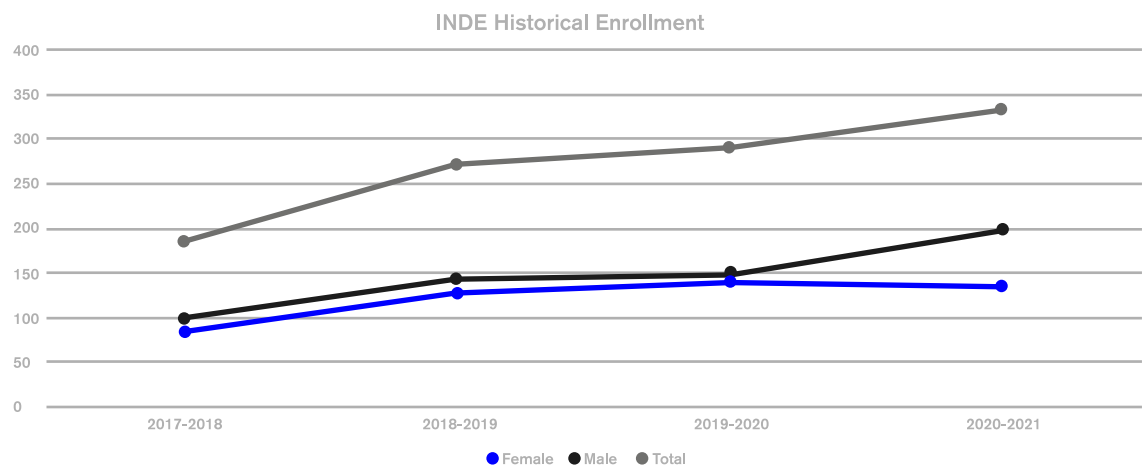
Mechanical engineering shows the largest growing gap between men and women across all majors



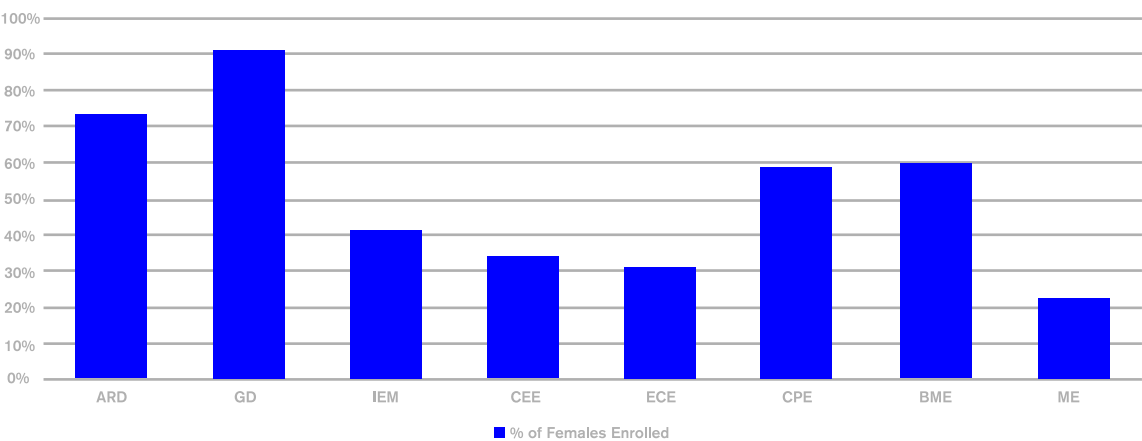
Although the major started with almost equal enrollment, now more women are choosing to go into chemical engineering



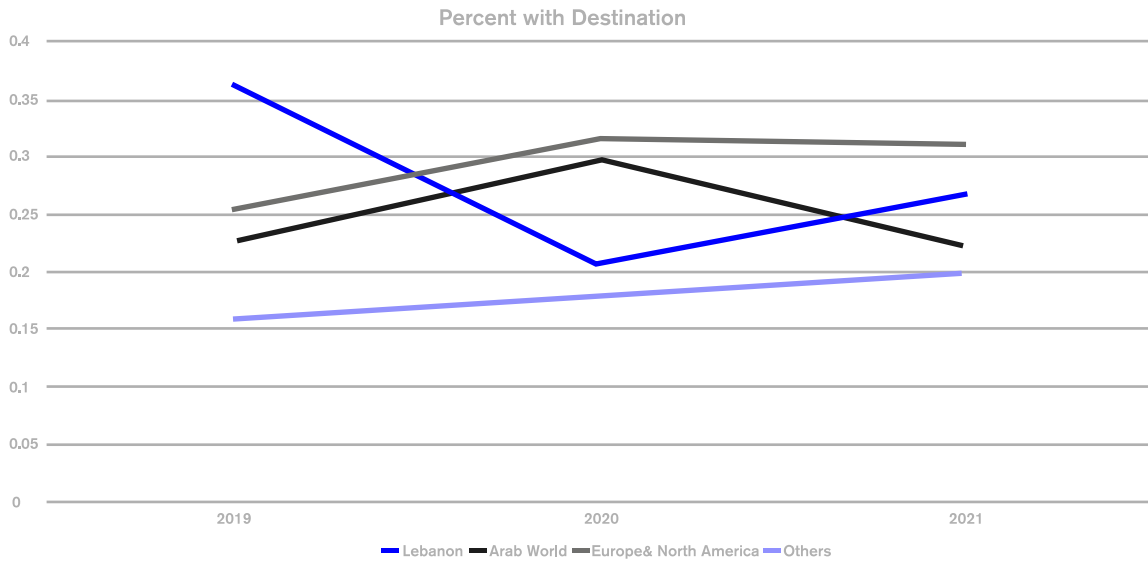
Over the years, we see an almost equal representation in Industrial Engineering



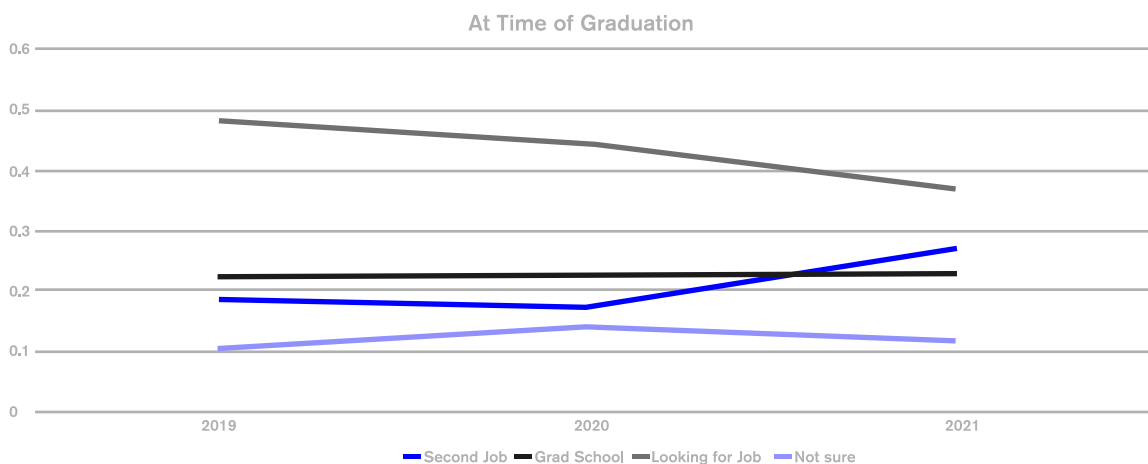
We can compare the percentages of female enrollment by major and see large disparities



With the recent crisis in Lebanon, more women are looking for opportunities outside of the Middle East, with Europe and the US as a top destination



More opportunities are needed, as more than 50% of students are still looking for a job at time of graduation



WE SEE A LARGER GENDER GAP FOR THE OLDEST ENGINEERING MAJORS. IN COMPARISON, THE NEWLY CREATED MAJORS (CHEN AND INDE) SHOW AN ALMOST 50/50 DIVISION.

AN UNCONVENTIONAL PATH TO SUCCESS

WRITTEN BY PIA SAADE

DR. ROUWAIDA KANJ



Whether located in Lebanon or in the US, Dr. Rouwaida Kanj has always been thriving, not only professionally but also academically. Her career started with a dream she had when she was a young girl: **“My grandfather was a civil engineer, and it was my dream to be an engineer like him.”** She was confident about what she was passionate about, ‘I like problem-solving, and enjoy solving engineering problems specifically.’ Back then, Dr. Kanj was advised by her high school teacher to pursue a degree in computer engineering. **She graduated from AUB in 1998 as a computer and communications engineer and placed first on the Dean’s Honor List.** This remains the first of her many achievements and contributions to the engineering field. After receiving her degree in engineering, she pursued a master’s degree as well as a Ph.D. in electrical engineering at the University of Illinois, where she maintained a perfect GPA and was awarded the IBM fellowship Ph.D. award three times.

Her professional career started as a research scientist with IBM, where she remained till 2012. That same year, **she came back to her alma mater, the American University of Beirut, to pursue a passion for research and academia.** And, ever since, this is where she has been contributing to the formation of engineers.

Witnessing the success of a person who was once in the same shoes as us is extremely inspiring. However, everything comes at a cost: Dr Kanj had some sleepless nights and went through some tough times, but reassured us that she does not remember any of them: **“They fade away. College years are memorable and cherished memories I guess to all.”** Dr Kanj truly believes in the power of self-esteem and patience.

When asked about a piece of advice she’d give to her younger self, as well as to her students, she answered:

**“BELIEVE IN YOURSELF.
CONFIDENCE AND PATIENCE
ARE TWO KEY ELEMENTS
FOR ACHIEVING ONE’S
GOALS.”**

It is empowering to hear these words from a person who had remarkable contributions to the engineering field, and who also received numerous awards.

However, engineering remains the most male-dominated field in STEM. As a result, as reported in the Harvard Business Review, **out of the 20% of engineering graduates who are women, almost 40% never enter the profession often because of the lack of support and countless stereotypes.** Naturally, one asks themselves how present discrimination is, so we asked Dr. Kanj if she had ever witnessed any type of discrimination: “Not when I was a student, but maybe when I was a working mom, once or twice but I did not let it bother me.” She even affirmed it in a very simple and straightforward way:

**“DON’T WORRY ABOUT
WHAT YOU HEAR;
LET YOUR WORK TALK
ABOUT YOU.”**

Being a woman did not refrain her from excelling, and she later became the Vice-Chair of the Women in Engineering branch within IEEE.

She encourages her students to remain and explore STEM: **“I work closely with all my students and I think it is critical to have them gain confidence in their abilities; my door is always open for advice.** Maybe I have not been much active on an organizational level but I see a great deal of work going on in the IEEE WIE branch. I think we need to raise more awareness in terms of nurturing the skills and breaking the fear barriers.”

As for the dilemma that Lebanese engineering graduates face regarding the choice of their professional career: develop their knowledge and evolve in the technical field, or join a non-technical field which might not fulfill their potential as engineers. “I think, the reason why students hesitate between technical and non-technical is due to the lack of the technical industry in Lebanon, and hence the motivation, which hopefully will change especially with the world heading to all of these remote work opportunities.”

As a final note, Dr. Kanj shared with us a quote that reflects her perspective on life, **“Good better best, you can never rest until your good is better and your better best! ”**

Looking back at the way her career started is really inspiring. She believed in a dream she once had as a little girl and took the necessary steps to achieve it no matter the cost. Today, she is perceived as an accomplished person and a mentor to many.

Hoping that this motivates all of you readers to excel, regardless of the path you decide to follow!

THE RISE OF WOMEN IN STEM DESPITE THE CHALLENGES

WRITTEN BY MELANIE KHALIL

THE STORY OF
DR. ELSA MAALOUF

According to a UNESCO study dating from 2015, women in STEM make up 34% to 57% of STEM graduates in Arab countries, in contrast to Western countries where these figures are surprisingly lower.

Unfortunately, this number does not reflect women's integration in today's job market, which discourages young girls to pursue careers in STEM. One woman who chose this path despite the challenges is Dr. Elsa Maalouf, Assistant Professor at the Department of Chemical Engineering and Advanced Energy. She is a true leader who has tirelessly worked on the integration of women in engineering, especially since joining AUB in 2018.

After pursuing her undergraduate studies at Ecole Centrale de Lille while pursuing a dual degree with the University of Texas-Austin, she obtained a PhD in petroleum engineering at the University of Texas-Austin. During her PhD, she worked in the Oil & Gas industry in world-renowned companies – ConocoPhillips and BHP Billiton – shattering societal norms in a male-dominated field. She recalls the main obstacle she faced throughout her career being the different set of rules for women when working on projects. Females are assumed to be more patient or more creative, or are expected to work on more administrative tasks – such as putting together a PowerPoint presentation or fixing the layout of a report – rather than leading and managing the group. This overshadows the full potential of the group and gives more work to a certain category of people. Eventually such behaviours, including unconscious bias, can make women move away from engineering. Indeed, accelerating women's integration in engineering is important to destroy these biases. The first step for any institution is raising awareness and reminding people that there is in fact an issue and that we should not sleep on it. In her own personal experience, Dr. Maalouf has always felt that she was in an



inclusive environment overall. During her studies abroad, she had mentors and supervisors who were aware of this issue, and made an active effort not to let this affect the performance or opportunity of the students. Moreover, she points out that we should make sure students, whether male or female, understand the core of engineering, especially at a younger age, in order to refute misconceptions. She explains that after conducting a series of interviews with students at AUB and another set with females in school, she realized that certain fields, such as electrical or mechanical engineering, were painted in erroneous ways and often led women not to join because of misconceptions. **They simply think it is not “for a woman.”**

Another important stakeholder to note is parents. Some parents in Lebanon have a lot of influence in females' careers, thinking that they are advising them but they sometimes lack a true understanding of engineering and the opportunities the field offers. The essence of this integration lies within the environment women are part of, hence the importance of creating an inclusive entourage to reduce dropouts and support the success of women from their studies and after joining the workforce. Having role models that they can relate to, who can explain to them what engineering is, and seeing them actually make an impact on society to witness the fact that, as an engineer you are capable of positively affecting people's life, can and will encourage women to feel better integrated in engineering and leave a mark on the world. To help with this integration, **Dr. Maalouf is working on numerous initiatives, among which is The Women Leaders in Engineering Scholarship program at AUB.** The program aims to offer scholarships to women in need to enroll in engineering. A mentorship program was then established to follow up with them and make sure they have someone to raise their concerns to. Through these women, she realized that many share the same experience and doubts and had to prove to someone in their entourage why they wanted to do engineering – which is also the case for many of her female colleagues.

Essentially, having a mentor is extremely helpful, which is why she decided to scale up the program. It was first upscaled with the American Institute of Chemical Engineers (AIChE) – AUB student chapter and will hopefully, by the end of the semester, be implemented at the AUB scale. Eventually, the goal is to link this initiative to the industry by having a mentorship for E3 and E4 students regarding industrial opportunities. Another initiative is the Pipeline Project, whose goal is to reach out to girls in school – starting ninth grade – to clarify to students and teachers what engineering truly entails and erase gender gaps.

Finally, to all you young women engineers out there, Dr. Maalouf has one piece of advice: have fun with engineering. It is not merely a milestone that you have to accomplish and stop there. Engineering opens many doors for your career; it is a place where you develop critical thinking and learn how to analyse, design projects, use theoretical and practical tools. Your path is completely up to you – you can choose to work alone in your office or on the field – and that choice is based on your personal preferences and your personal preferences alone, not on any gender or societal barrier.

As an engineer you will make an impact on society, and you will have the opportunity to mentor younger females as well: “Just have fun with engineering. Being a female engineer is a powerful statement, especially when you’re passionate about it, so go for it, and you will find the support you need.”

“HER ADVICE TO BOTH STUDENTS AND ENGINEERS IS TO SEEK SUPPORT IF THEY NEED IT, BECAUSE VOICING YOUR OPINION AND EXPRESSING YOUR STRUGGLES CAN OFFER YOU CLARITY OR GET YOU ADVICE FROM OTHER FEMALES WHO HAVE GONE THROUGH SOMETHING SIMILAR.”

BREAKING BARRIERS

AN INTERVIEW WITH
DR. ALISSAR YEHYA

WRITTEN BY MELANIE KHALIL

In the face of political and economic unrest, and amidst a dominating patriarchal system, the fight for gender equality has often taken a back seat in the MENA region. Breaking gender barriers and societal norms is essential to ensuring a future where equality between men and women on all levels – Economic Participation and Opportunity, Educational Attainment, Health and Survival, and Political Empowerment (The Global Gender Gap Report, 2018) – is perpetual. In an interview with Dr. Alissar Yehya, we tackled biases, obstacles and learnt valuable lessons from a woman in STEM. By diving deep into her background, research, and aspirations, we see a true woman leader, inspiring us to break the glass ceiling.

First, it was always her goal to work with big names in the field of materials, so, after obtaining her Ph.D. from the Doctoral School of North France, she pursued her post-doc at the Harvard John A. Paulson School of Engineering and Applied Sciences working with the Pr. James R. Rice group before joining it as a research associate. After this enriching

experience, she joined AUB in 2018 as a visiting professor in the Department of Chemical Engineering and Advanced Energy and is currently an Assistant Professor in the Civil and Environmental Engineering. Her current work focuses on two themes which converge into multiscale sustainability. The first theme relates to how big industrial and engineering projects affect our lives and the environment, in terms of applications associated with the Oil and Gas industry related to the induction of earthquakes and leakage of methane into drinking water aquifers. As for the second theme, her projects are based on finding ways to reduce energy consumption through materials that could be eco-effective. Furthermore, she started a small-scale project, Eco-match. The idea is to create a platform that is able to help processes move from linear models to circular models and help companies achieve circular economy.

“IT IS OKAY TO HAVE
SOME KIND OF BENDING
IN YOUR LIFE”



Dr. Yehya is an inspiration to young women, by excellence. Her hard-work and determination to attain her goals, her commitment to achieving sustainability across all pillars, and her innovative mind encourages us women in STEM to pursue and fight for our own goals and dreams. When asked about biases or obstacles she faced throughout her career, Dr. Yehya explains that her career choices helped her overcome these biases. When she started working as a civil engineer, she preferred to work in an office where she could design and innovate rather than work as an on-site engineer in construction. However, later on, she figured out that there could have been several barriers had she had chosen to work on-site. She acknowledges that people often do not appreciate having women leading a site, and as such often push them out.

On that note, she explains that she was lucky not to have been raised in an environment that incorporates these gender barriers in the first place. She owes her mother, she says, for releasing her from these limitations which allowed her not to label people and free herself from what her gender could limit her to do. Because of her own journey, she was able to work in areas where there is no discrimination, such as AUB, but the sad reality remains that this is not always the case, and that a lot of women in STEM have faced such challenges. More importantly, this discrimination is the most prominent in decision making positions as they require a lot of time and dedication and tremendous responsibility, and the reason why more often than not women don't step up to take on these roles is due to the responsibilities that they have – or rather that society has put on them – in parallel to their job. Dr. Yehya believes that not allowing women to be released from some of these responsibilities and pressure – especially their role as primary caregivers in the community – is what hinders the participation and success of women in these positions and leads to us being underrepresented in such roles.

As such, it is important for both genders to take the lead in this responsibility and actively work on equally sharing the duties – of being a provider and being a caregiver – between genders. She uses a metaphor of bending and fractures – true to someone who works in the field of materials – to illustrate that it is completely okay to face troubles and challenges, and that these obstacles could be an opportunity for us to show our resilience and strength: “It is okay to have some kind of bending in your life,” she says, “because that doesn't mean that you allow yourself to be fractured, that doesn't mean you are not strong. Keep your dreams big, do not limit them specially with gender, because as a person you can reach wherever you want, and it is okay not to reach that fast, to fall down, to bend. Don't let anything destroy your potential to reach your dream.”

As a final piece of advice for all young women in engineering, Dr. Yehya expressed the magnitude of the impact that we have, as young women, to be role models and inspire the current and next generations. As engineers, in particular, we have the luxury to be impactful decision-makers rather than followers responsible to find and implement sustainable solutions.

SO WHY NOT, **AS WOMEN ENGINEERS**, BE LEADERS IN
TERMS OF CHANGING LIMITATIONS AND BARRIERS?
WHY NOT SHOW THAT WE CAN DO IT DIFFERENTLY,
THAT WE CAN ACHIEVE WHATEVER WE WANT AND
THAT WE CAN DO IT THE RIGHT WAY?

MSFEA AND THE FIGHT FOR GENDER EQUALITY

A STUDENTS
PERSPECTIVE

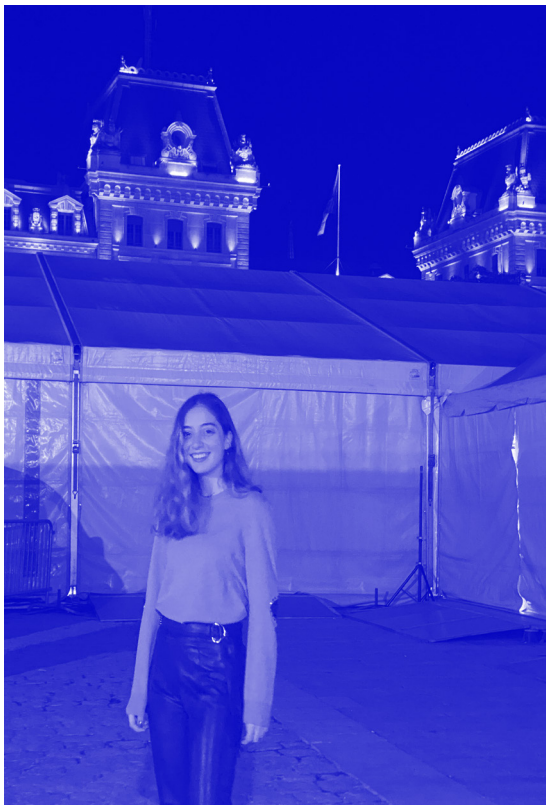
WRITTEN BY PIA SAADE

Despite the increased integration of women in STEM, engineering is still often perceived as a male-dominated field. However, AUB's Faculty of Engineering, the Maroun Semaan Faculty of Engineering and Architecture (MSFEA), distinguishes itself by the diversity of majors it offers, and the various opportunities it provides. One unique faculty, shaping future mechanical, chemical, computer, industrial and civil engineers, as well as architects and graphic designers.

But what about students' perception of MSFEA in the fight for gender equality and women's empowerment?

When it comes to equality, MSFEA is constantly aiming to fill the gender gap within some majors. For instance, the Maroun Semaan Women Leaders in Engineering Scholarship program offers full scholarships to newly undergraduate females whose profiles meet specific criteria, such as demonstration of leadership skills and community involvement. This program contributes to the development of future leaders. From the students' point of view, MSFEA's perceived as a well-balanced environment, as Maria Nour Makzoume, a third-year chemical engineering student, reports:

"I'VE NEVER WITNESSED ANY KIND OF GENDER DISCRIMINATION WITHIN MSFEA. IT PROVIDES EQUAL OPPORTUNITIES FOR BOTH MEN AND WOMEN WHEN IT COMES TO JOBS, INTERNSHIPS, OR ANYTHING EDUCATIONAL; I'VE NEVER FELT DISADVANTAGED OR NOT TAKEN SERIOUSLY IN THE FIELD."



However, problems might emerge once women graduate and find themselves in a less organized environment, where they can be perceived differently because of their gender, instead of their skills. As Yasmina Naja, a second-year industrial engineering student, highlighted it,

“FEMALE AND MALE STUDENTS ARE GIVEN THE **EXACT SAME OPPORTUNITIES** WITHOUT TAKING INTO CONSIDERATION THE **REAL-LIFE INEQUALITIES THAT WOMEN FACE IN MALE-DOMINATED INDUSTRIES LIKE ENGINEERING.** EDUCATING ALL STUDENTS ON THOSE REALITIES IS ESSENTIAL IN ORDER TO **PREPARE US, WOMEN,** TO FACE THEM IN THE FUTURE, AND **IT’S ESSENTIAL FOR FUTURE MEN IN THE DEPARTMENT TO BE AWARE OF THEM** SO THEY WON’T REPLICATE THE SAME MISTAKES AND THEY’LL BE PART OF THE **CHANGE** THAT WILL GET US **CLOSER TO EQUALITY IN THE WORKFORCE.**”



Therefore, it is essential to ensure that the environment prioritizes women's inclusivity, as a part of MSFEA's mission. As a proposition, Yasmina suggested organizing talks, by inviting female MSFEA graduates to share their experience in their workplace, and the challenges they may have faced. After all, "awareness is the first step towards change." The latter doesn't usually occur overnight, it is indeed a process.

Additionally, the growth and evolution of the faculty can be observed through the leadership positions which have become more accessible to females. Gael Merhej, a second-year chemical engineering student, shared her experience as a student representative for all E2s.

"AT FIRST, I WAS REALLY HESITANT TO RUN FOR THE STUDENT REPRESENTATIVE COMMITTEE (SRC), BUT THE SUPPORT I RECEIVED FROM MY FRIENDS WAS REALLY ENCOURAGING. TODAY, AS A PART OF THE STUDENT BODY COUNCIL, WE ALL WORK TOGETHER ON MULTIPLE INITIATIVES, AIMING TO CONTINUOUSLY IMPROVE MSFEA AND THE STUDENTS' EXPERIENCE."



MSFEA's work is also complemented by clubs and societies that make sure to answer the students' needs and satisfy their intellectual curiosity. For instance, the [Women In Engineering Student Branch](#), which is part of the local IEEE Student Branch, is solely devoted to encouraging young women to enjoy engineering. [Christie Berchan](#), a member of WIE's events' team, shared a glimpse of a project they are currently working on, in collaboration with MSFEA. In order to [stimulate](#) young girls' curiosity about engineering, they plan on visiting different schools in the region to encourage girls to pursue careers in engineering.



However, WIE is not the only club highlighting women's potential. The Women at Work club was created back in 2019, by a group of women going into consulting. As Danielle Saleme, the club's Vice President described it, many industries are male-dominated, and therefore "women need to work as double as men just to prove themselves." Hence, the club's cabinet dedicated itself to orienting women in their careers, and supporting them. With a clear mission statement,

"AIMING TO CREATE CAREER AND NETWORKING OPPORTUNITIES FOR WOMEN AT AUB"

The Women At Work club organizes a variety of events, from hosting diverse panels to interviewing successful women in the workforce. They all aim to reduce gender stereotypes and promote impartiality in the workplace.

It is difficult to untie our society from old habits, but the battle is worth it. Female students leading clubs, occupying cabinet leadership roles can be perceived as a victory in the battle against discrimination. MSFEA also plays an important role in this battle since it ensures that its students are exposed to equal opportunities, and tailors its programs to their needs. Despite the industry we are in, women deserve a seat at the table to express themselves. And the battle to make it happen is happening and led by our progress and initiatives.



**WORD FROM
FACULTY**

AUB, ENGINEERING, AND LEBANON

A CHAT WITH
DR. GEORGE AYOUB

WRITTEN BY KHALIL FAYAD

How long have you been part of the AUB family?

As soon as the question was asked, Dr. Ayoub took some seconds to rewind his own life back to 1952, the year he joined AUB for his undergraduate degree in civil engineering. After completing it four years later, Dr. Georges Ayoub worked for six years (till 1962) before coming back to the university to work part time. In 1967, he decided to do a Ph.D. at AUB and since 1970 Dr. Ayoub maintains his place as a full time faculty member (i.e. 56 years of teaching).

What would your arguments be to convince high school students to choose engineering?

"You HAVE to pick something that YOU like" is the first criteria in choosing a major, he said. "If you're good at math, this will help you but would not make you an engineer". An engineer has the curiosity to see, get inspired, evolve because "engineering is all about creating".

To generalize, Dr. Ayoub reduced a successful life to two parallel lines: on one hand, working hard and on the other, enjoying yourself. These are the only two parallel lines that can possibly intersect at the point called success.

What keeps you hopeful about Lebanon and its generations to come?

Dr. Georges Ayoub started by apologizing for what us, the young innocent generation, are going through: "I always say to my students that I'm so sorry for what is happening nowadays because it will not change in the short run." He then went on to add "when I graduated, things were open for us, we could have a job in no time."

Moreover, Dr. Ayoub insisted on how drastically things have to change for him to retrieve hope. He believes that **people have to change their mentalities by being more responsible and less selfish**: instead of always counting on their connections and their money, they should care about the wellbeing of the society.

To illustrate his point of view, the long-time AUB faculty member shared an anecdote that ages from when he worked as a consultant. The company he worked for used to collaborate with some other European ones and that's where he met a colleague from Denmark who told him that, in Denmark, "citizens are free to retire at the age of their choice and they would still be paid as if they are still working at that age."

Naturally intrigued as a Lebanese, Dr. Ayoub proceeded to ask him why he wouldn't retire to which his Danish colleague answered:

"I will never do that to my country."

Consequently, Dr. Georges Ayoub presumes that if we adopt a mentality similar to that of his Danish colleague then "we will have a nation" and "everything is going to be better off."

Unfortunately, he believes that mentalities need generations to change because every citizen's attitude is grown at home and the Lebanese household attitude is not very conducive.

Above all the difficulties Lebanon is facing, Dr. Ayoub thinks that

**"LEBANON CAN BE LIKE
ANY EUROPEAN COUNTRY...
ANY! A BOOMING
TOURISM SECTOR WITH
MILLIONS OF TOURISTS
PER YEAR"**

and that's without even looking at other attractive aspects like the appetizing food, the music, the culture...

What does AUB have that you can't find in any other university?

He is proud to be an AUB graduate and wishes for the university to persist as it always did although he finds a sort of leniency that is taking place that is destroying the students. He urges the administration to do something about it.

“AUB IS ONE OF THE BEST INSTITUTIONS YOU CAN BE AT, IT GIVES YOU ALL THE LIBERTY TO GROW UP, BENEFIT AND COME OUT AS A TOP EDUCATED PERSON.”

What are your tips for graduate and undergraduate CIVE students to succeed at AUB and beyond?

“You come to AUB to learn, and not just to pass.” Whatever we learn, it is important to fully grasp it and not think that “this won't help me in the future” or “this is not in my area of specialization.” At the end of the day, in a professional career, one is not always their own boss. Hence, Dr. Georges Ayoub strongly advises upcoming civil engineers to study hard and be good at all their courses (geotechnical, statics, transportation, ...). He urges them not to take any “shortcut” but rather study on a daily basis because studying before the exam is not learning. Dr. Ayoub makes sure to add: “make the best out of it so that when you leave you have something up there” while knocking on his head.

Are there any parting words you'd like to end this interview with?

To all students not taking their studies seriously, Dr. Ayoub says: “Your parents who suffer to pay your tuition fees do not deserve this. You will fail and, consequently, they will fail too. They spent “الغالي والنفيس” (al ghali wal nafees - what's expensive and precious) for you to be at this stage of your education so make sure to work hard and take it as seriously as you can.”



THE ART OF RESEARCH

WRITTEN BY JOSEPH CHOEFATI

INSIGHTS FROM
DR. LOUAY BAZZI

Dr. Louay Bazzi is a Professor in the Electrical and Computer Engineering (ECE) Department at MSFEA with an academic path that is inspiring to say the least. After completing his Bachelor's degree in Computer and Communications Engineering (CCE) from AUB in 1996, he went on to complete his Master's degree and Ph.D. at the prestigious Massachusetts Institute of Technology (MIT) in the United States. Once done with his graduate studies, Dr. Bazzi came back to MSFEA where he has been a faculty member ever since 2003.

Going from AUB to MIT is an impressive feat in itself, one that a lot of students dream of achieving which naturally brought us to ask Dr. Bazzi about the differences between both institutions and how they stack against each other.

To that question, Dr. Bazzi answers that, in terms of material and curriculums, many MSFEA courses cover the core material in MIT courses but they are not as condensed. However, Dr. Bazzi makes sure to highlight the fact that he did not face any issues when transitioning to MIT in terms of knowledge background and that MSFEA prepares its students well for graduate studies.

In addition to his role as an educator, Dr. Bazzi has a stellar career in research. He has numerous research papers published in various international journals and conferences. However, he is most famously known among students for his first research discovery which is the Akra-Bazzi theorem. The Akra-Bazzi theorem is a method that is used to analyze the running time of divide-and-conquer algorithms.

Many people know about the Akra-Bazzi method but very few are aware of the story behind it.

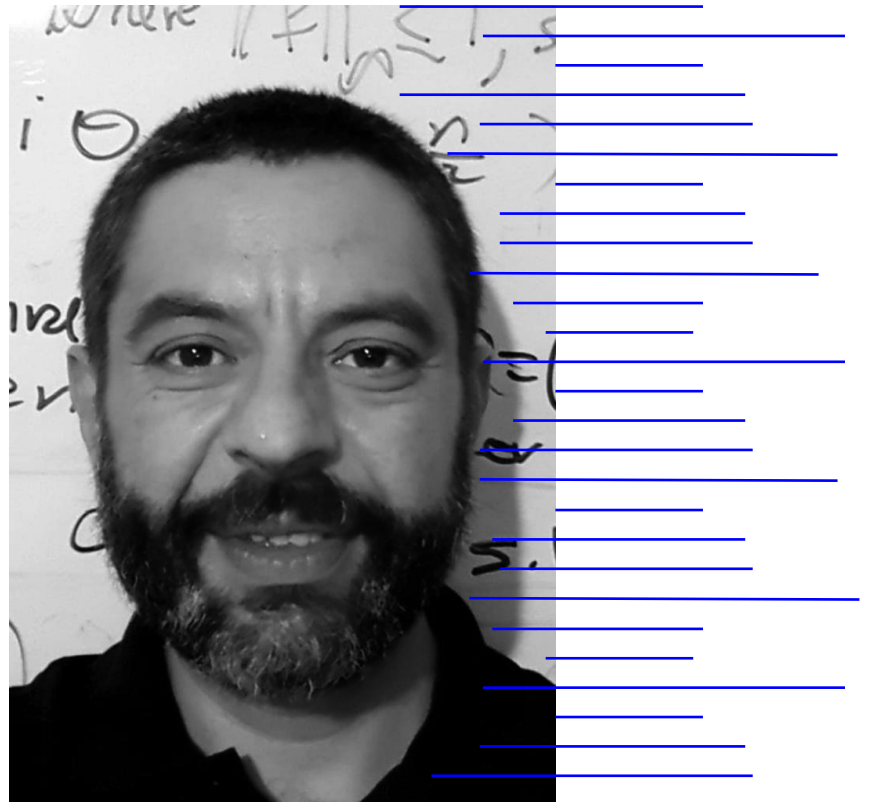
During his undergraduate studies, Dr. Bazzi was taking a course on algorithms. In that course, a technique, called the "Master Theorem," that is used to solve recurrence relations associated with divide-and-conquer algorithms, was introduced. However, this technique has limitations as it doesn't apply to certain commonly encountered divide-and-conquer recurrence relations.

Consequently, Dr. Bazzi took it upon himself to develop a more powerful method that would be useful in studying recurrence relations but did not have the limitations of the Master Theorem. And thus, the Akra-Bazzi theorem was born.

Although Professor Bazzi is most famously known among undergraduate students for his divide-and-conquer recurrence relations theorem, he states that his most significant contribution in his research career up to this point is a problem he solved while being a professor at AUB in 2007.

The problem he solved was the 17-year-old open problem called Linial-Nisan **Conjecture** in the area of pseudorandomness, which is a subarea in Complexity Theory.

He worked on this problem on and off for over six years before finally being able to establish the correctness of Linial-Nisan Conjecture for the case of depth2- circuits.



Now, for his latest work in research, Dr. Bazzi has been working for the past five years, on another open problem in the area of pseudorandomness. His strategy in research is to work on more than one problem of varying difficulty in parallel due to the uncertainty in the time it takes to obtain an interesting result when attacking a fundamental problem. His research interests are in **theoretical computer science**, namely, in the theory of **error-correcting codes**, **pseudorandomness**, and **computational complexity theory**.

Besides being a stellar academic and researcher, Dr. Bazzi believes it his responsibility to make sure AUB survives and excels despite the harsh times Lebanon is facing. To that end, he is always more than happy to guide students, especially those interested in working in research.

One question he gets asked a lot is about studying techniques.

Dr. Bazzi says that, as a student, he adopted problem solving as a learning technique. When studying his courses on his own as an undergraduate, instead of just reading theorems along with their proofs, he used to only read the statement of a certain theorem and try to prove it on his own. He used the same strategy to learn algorithms. He says that this technique of studying shaped his problem-solving skills and trained him for his career in research, but the main drawback was that it took him a lot of time to complete the material.

Consequently, to students interested in research, Dr. Bazzi recommends adopting the spirit of this studying technique while being pragmatic about their time constraints. In general, he would advise them to move from the “receiving end of the instructional methodology to the active learner’s end, and think of the results first before reading or studying them.” He says that this is one of the themes of his newly modified introduction to programming course (EECE 230X), that is now being offered in flipped classroom delivery mode.

Another piece of advice to students would be to **do research as soon as possible**, preferably during undergraduate studies. He recommends students to first find the sub-area in their studies that they are most passionate about. After that, they can take the undergraduate research course where students get the chance to conduct research under the supervision of a faculty member. These experiences, at an early stage, are fundamental as they will give students a concrete apprehension of what a career in research is like, and it will help them decide if they really want to pursue such a profession.

DEFINITIONS

Theoretical computer science is the foundation of computer science and it lies at the intersection of mathematics and computer science.

Error-correcting codes are schemes used to communicate reliably over noisy communication channels.

Pseudorandomness is a branch of complexity theory which aims to efficiently generate objects that appear to be statistically random to computation with limited resources, despite having been produced using little randomness.

Computational complexity theory aims to classify computational problems according to the computational resource needed to solve them.

A conjecture is a conclusion that is suspected to be true and provable but hasn't been proven yet.

INTO THE FUTURE

WHAT'S NEXT AFTER MSFEA?

WRITTEN BY MICHEL LAMAH



As many students at AUB are learning about the airline industry, many are left with questions on the future of their career. Statistics about the 2021 class from the MSFEA Career Development Center show that 73.23% percent of graduating students left the country while 26.77% only stayed in Lebanon. The brain drain is real, and our country will continue to lose the best minds it has in store as the cascade of crises deepens day by day.

ONE PARTICULAR STUDENT LOOKS AT THE AIRPORT GUIDE AND INITIATES A CONVERSATION

MSFEA STUDENTS ATTENDING THE MEA TOUR, LOOKING AT THE AIRPLANES IN AWE

“MISTER !” SAYS CHADI

**THE GUIDE REPLIES:
“YES? ANY QUESTIONS?”**

“EMTAN FINA NETLA3 BIL
TIYARA W NFELL MIN HEL
BALAD?”

“EMTAN MA BEDAK!”

“IS RIDING THE AIRPLANE
TO ANOTHER COUNTRY
PART OF THE TOUR?”

**“NOT REALLY BUT I WILL
START THE ENGINE
FOR YOU!”**

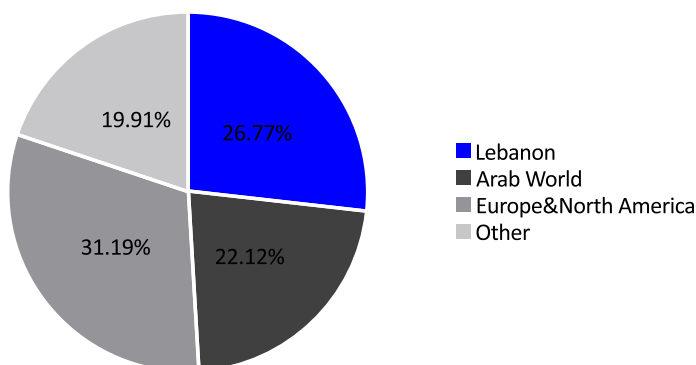
When it comes to the first step in their professional careers, about 48.45% of students are not sure what they will be doing after graduation or are still looking for a job. As expected, uncertainty lies in the future of a lot of graduating young engineers, architects, and graphic designers and the challenge is real, not only because of a collapsing country with limited opportunities but also because students stand at a very important crossroad in their professional lives.

The world is changing around us and we should ask ourselves what type of skills we should learn to gain a competitive advantage and have access to new opportunities in expanding markets. The COVID-19 pandemic has undoubtedly created a new “normal” and the nature of jobs and the working environment have changed. To begin with, the pace of technological advancement is happening at an unprecedented rate.

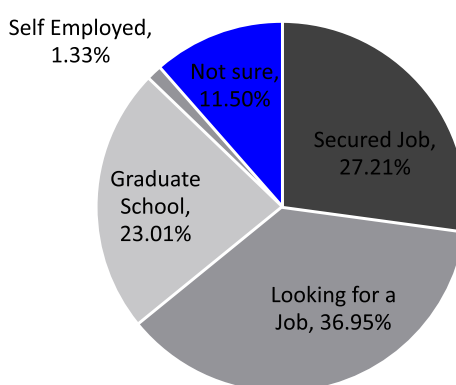
New platforms like Zoom and Webex have come into the picture and new ways to deliver courses have been implemented. And although the pandemic is gradually receding, these platforms are here to stay. Furthermore, the pandemic has highly accelerated the development and integration of critical fields of the fourth industrial revolution such as cloud computing, data analytics, cybersecurity, machine learning and artificial intelligence, robotics, and financial technologies, all of which will open a wide range of possibilities for future employment.

Companies are looking to restructure their workforce in response to the new technologies mentioned above, by introducing further automation, reducing their current workforce, expanding their workforce by using deeper technological integration, and task-specialized work. Moreover, certain crucial skills will be in demand in the upcoming few years, such as analytical thinking and innovation, active learning, problem-solving, critical thinking and analysis, creativity and originality, and leadership and self-management. These skills are necessary for an individual to be able to cope with a hectic and uncertain lifestyle; something that has increasingly become the norm during the pandemic.

DESTINATION REGION



MAIN ACTIVITY AFTER GRADUATION



**SOURCE: EXIT SURVEY AND
STATISTICAL ANALYSIS
PROVIDED BY THE MSFEA
CAREER DEVELOPMENT CENTER**

MSFEA SHAPING THE NEXT DECADE OF LEARNING

WRITTEN BY SARAH BAALBAKI

In light of the permanent shifts the COVID-19 pandemic has induced, MSFEA has introduced multiple initiatives to revolutionize education and integrate the lessons of the online learning period.

The first of these initiatives is the permanent online or hybrid course delivery. Although the student body came back to campus, some professors have decided to keep some courses online. One example is EECE 230 - Introduction to Programming.

A core requirement for all students in multiple departments, especially the ECE department, the course has adopted a hybrid model: an online mode of delivery for the lectures complemented with an in-person lab component. The lectures are online and asynchronous, consisting of several small videos (ranging from around 8 to 20 mins) per lecture. The lectures are interactive, meaning that they are accompanied by knowledge checks which are Moodle-based multiple-choice questions asking students to complete certain pieces of code or analyze a code's runtime.

One worthy thing to note about this online module is that the next video in the lecture series will not open until the previous video was watched and the knowledge check was completed, ensuring the student has the necessary knowledge to move forward. As for the three-hour lab component, it is an on-campus lab given by students who have previously taken the course. The lab was moved back on campus to help students complete their weekly assignments.

EECE 230 is not the only course following that model. Another prominent one is INDE 410 - Engineering Ethics. A requirement for all engineering students, the material is also delivered in a fashion very similar to that of EECE 230: online asynchronous lectures consisting of Moodle-based multiple-choice questions that must be completed in order to advance to the next stage.

In addition to the lectures, students are asked to contribute weekly to a forum discussion where they have to leverage the knowledge they have learnt to give their written opinion on an ethics question.

A natural question that one asks themselves is: "How effective is that model?" According to the Student Learning Experience Questionnaire (SLEQ) that was administered online at end of the 2020 Spring term to students in all courses (37,000 responses), students believe the strengths of online learning are the flexible and convenient access to the course material, the fact that material made available online was organized and easy to follow, and, most importantly, the ability of course instructors to adapt well to online teaching. On the other hand, online learning hindered students' engagement, failed to address differences in learning styles, and relies a lot on IT support that wasn't always available or helpful when needed.

THIS IS A GOOD INDICATOR THAT HANDS-ON APPLICATION OF KNOWLEDGE IS BETTER DONE AND UNDERSTOOD WITH FACE-TO-FACE EXPLANATIONS AND LIVE INTERACTION.

The American University of Beirut, in partnership with UAE-based Abdulla Al Ghurair Foundation for Education, launched a digital learning hub called the Abdulla Al Ghurair Hub for Digital Teaching and Learning that serves thousands of Arab students across the region. The hub runs 15 online master's programs, diplomas, and certificates that "align with evolving regional employment trends", and work to fill a gap in the regional higher education and online education market. This comes with the aim of providing online access to higher education by digitizing existing courses at AUB's MSFEA Faculty of Engineering and adding new courses, accompanied by cutting-edge learning technologies that will serve the fast-paced and ever-evolving needs of regional and global employment markets. With such a digital hub, AUB President Fadlo Khuri believes that young people would be empowered in critical fields, such as engineering and architecture, using interactive learning tools.

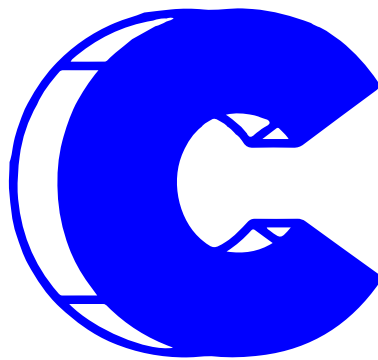
In 2021, MSFEA launched a partnership with LinkedIn Learning; an online educational platform that helps one discover and develop business and technology, and creative skills through expert-led course videos. The benefits of this partnership are major. Not only would a LinkedIn Learner receive a Certification from LinkedIn, but they would also be able to receive official academic credit for completed learning content, by qualifying a student to enroll in a 3-credit course. The course content will be considered as that of the LinkedIn Learning Path, and so the student simply sits for an exam that will signify his completion of the course. The two main learning paths available now are the "Engineering Management Course Path", with courses such as "Become a Project Manager" and "Become a Data Analytics Specialist," and the "Electrical and Computer Engineering Course Paths" with courses such as "Become a Data Scientist," "Become an Ethical Hacker," and many more.

ONLINE COURSE DELIVERY ISN'T
THE ONLY INNOVATION MSFEA
HAS INTRODUCED THIS YEAR.
THE FACULTY'S LEADERSHIP HAS
WORKED HARD TO BRING NEW
INITIATIVES TO LIGHT

LinkedIn Learning



مؤسسة عبدالله الغرير للتعليم
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