LAU
الجامعة اللبنانية الأميركية
Lebanese American University

School of Engineering

Annual Report

2013 -2014

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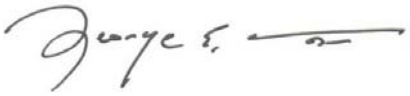
1 LAU SCHOOL OF ENGINEERING DEAN'S MESSAGE

The academic year 2013-2014 has been very exciting and productive for the LAU School of Engineering highlighted by the following achievements:

- Effective framework for the implementation and oversight of the School Strategic Plan (2013-2018). All SP deliverables scheduled for 2013-2014 were successfully completed.
- Improved Faculty Productivity in terms of innovative teaching, research and outreach activities.
- Launching a new Bachelor of Engineering degree in Petroleum Engineering.
- Launching a Joint Diploma in Green Technologies with the American University of Beirut and the American University of Cairo.
- Experimentation with Technology-Enhanced Learning such as online and blended courses.
- Development of a new engineering program in Mechatronics Engineering.

It is my pleasure to share with you this report that delineates the activities and achievements of the various operational entities of the School of Engineering for academic year 2013-2014. The LAU School of Engineering continues to play an important role in pursuit of the university's mission of excellence, leadership, and service. We can all be proud of our collective efforts and present achievements and we will forge forward to greater heights with full passion, strong will and clarity of vision.

Sincerely,



George E. Nasr, Ph.D.

Dean and Professor

2 DEAN'S OFFICE REPORT

2.1 Faculty

In AY 2013-2014, the School of Engineering had 30 full-time faculty members plus one adjunct faculty. All 30 faculty members are either tenured or on tenure track. They are distributed over the ranks as follows: 1 Professor Emeritus, 5 Full Professors, 11 Associate Professors, and 13 Assistant Professors. Out of the 30 members, one new faculty joined the IME department during AY 2013-2014. The search committees considered 145 applications for full-time faculty positions and selected 4 new faculty members to join the SoE during the 2014-2015 academic year; one fulltime tenure track position and three visiting positions. The current full-time faculty to student ratio is 26.5%.

In October 2012, one faculty member applied and was promoted to the rank of associate professor. In January 2013, two faculty members applied to the rank of associate professor. The school hired 45 part time faculty members during the fall 2013 semester.

The research activities of the SoE faculty produced over 42 research articles published during 2013. During the same period, several research projects were funded and initiated, one grant with a sum of $100,000 under the Partnerships for Enhanced Engagement in Research (PEER) Program in addition to two CNRS grants. One SoE faculty member took a sabbatical leave during the spring 2014 semester. One faculty performed research in the USA during summer 2013 on a Fulbright Research Award, while another faculty member is spending summer 2014 on an LAU summer research grant. Three faculty members are actively serving as associate editors for prominent journals in their fields.

2.2 Students

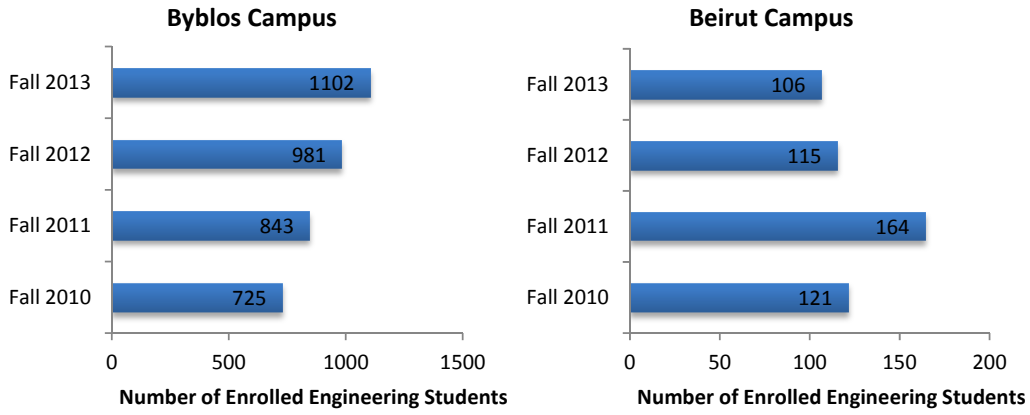
The SoE student body continues to grow. During the fall 2013 semester, 1208 students registered in all programs; 1102 students were registered on the Byblos campus and 106 students on the Beirut campus. The total number of students increased by 10.2% compared to the previous year and is expected to continue to increase over the next year by approximately 4%.

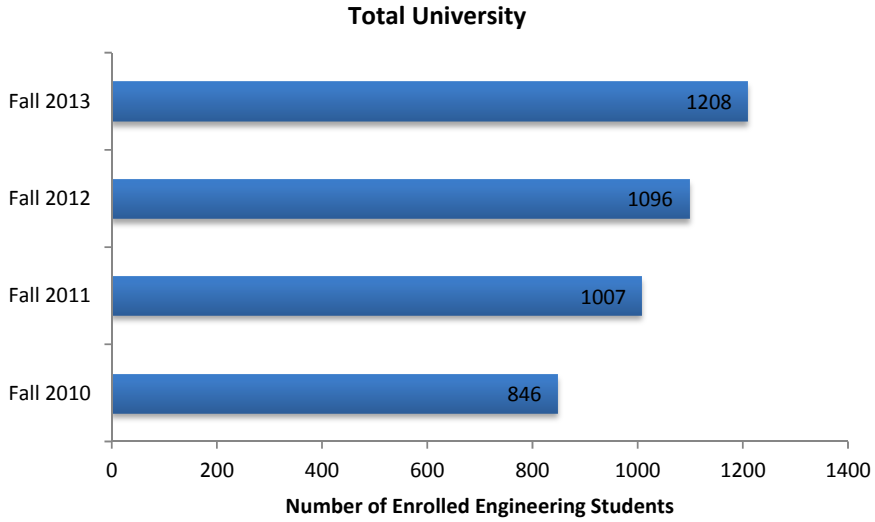
The number of enrolled graduate students has increased by approximately 59% to reach 27 students. During academic year 2013-2014, 174 undergraduate degrees and 10 graduate degrees were awarded raising the total number of SoE alumni to 1592. The number of new first time enrolled students increased by 4.8% compared to the previous year, admitting a total of 285 new students. The average SAT scores of admitted students is 1566 (666 on Math) dropping slightly from 1593 (666 on Math) during the year before. The average Sat Score for enrolled first time students kept on slightly improving especially for the Math scores. The averages are shown in the following table.

	SAT Critical	SAT Math	SAT Written	SAT Total
Fall 2011	438.7	647.4	469.4	1,544.0
Fall 2012	440.1	656.5	474.2	1,554.7
Fall 2013	445.0	659.9	468.9	1,557.5

In order to increase the enrollment number of high-ranked students, the SoE successfully organized its first Engineering Scholarship Award Competition on July 10, 2014. In this competition the SoE hosted the top accepted students to its programs (student selection criteria were set by the SoE Student Affairs Committee). The winners received 6 scholarship awards, 3 of which are 30% and the remaining 3 are 25%. These awards are on top of whatever they already have and will cover the entire 4 years as long as students maintain a GPA of 3.2 or higher.

The students are distributed between Beirut and Byblos campuses as follows:





Student enrollment in the School of Engineering per Major is shown in the following table. The student retention rate in SOE from sophomore to junior class is 93.6%, with 95.1% in Byblos and 90.9% in Beirut. The students registered in 498 SoE courses: 256 were offered in the fall semester and 242 during the spring semester.

	Fall 2013	Spring 2014
TOTAL UNIVERSITY	**1208**	**1140**
BE-CVLENG	497	472
MSE-CVLENG	7	7
BE-CMPENG	147	141
BE-ELCENG	98	87
MSE-CMPENG	10	6
BE-INDENG	96	92
BE-MCHENG	343	325
MSE-INDENG	10	10

2.3 Assessment

The School of Engineering ensures academic excellence through a strong commitment toward ABET's accreditation. The school rigorously followed the assessment schedule as set by the 2013-2014 plans.

This resulted in a total of 22 Student Outcomes (SO) assessed. Furthermore, Course Improvement forms were released and collected on time.

The employer surveys were sent this year to 151 registered managers with 39 of them responded.

As part of its strategic plan, all departments initiated the review the Program Educational Objectives and the Student Learning Outcomes for all their Master Programs.

2.4 Accreditation

All five bachelor programs at the School of Engineering are ABET accredited. The next comprehensive review visit will take place during the 2016-2017 academic year. Furthermore, the school took an active role in the on-going University wide NEASC self-study and ensured that all required documentations were provided.

As part of its commitment to ABET accreditation and in order to keep abreast the latest developments in assessment techniques, the Dean and Associate Dean of the SoE attended the 2014 ABET Symposium that was held in Pittsburg, PA in April 3-4, 2014.

2.5 Strategic Plan

The SoE developed an implementation schedule for its 2013-2018 strategic plan that covers all three pillars of Students, Education and Faculty by expanding initiatives into action steps with start dates, frequency, responsibility and budget. A tracking plan was also devised for each action step that covers the assessment method, target level and deliverable.

The Advisory Committee of the SoE regularly updates the implementation and tracking plans of each academic year during each of its meetings. The approved updates are posted on the school website on a regular basis.

2.6 New Programs and Initiatives

The SoE worked on enriching its offerings by preparing the grounds to offer a BE in Petroleum engineering as of fall 2014 and assessed the feasibility of other new programs and initiatives which are summarized below:

- A committee was formed by the Dean to manage and oversee the initiation of the BE in Petroleum Engineering. A visiting professor will be joining the program in September 2014. A healthy number of students applied to the new program which seems to be promising. All the logistics are in place to start the new program.
- Through the Tempus Pro-Green project, it was decided to offer an online joint diploma in green technologies between LAU, AUB and AUC. An agreement to form a professional green technologies consortium between the three institutions is being finalized to manage this diploma. LAU will offer two fully online courses in fall 2014 and is planning to offer four more courses in spring 2014.
- The governmental forms of all new programs were properly submitted to the Ministry of Education and Higher Education. These includes the BE in Petroleum Engineering and Chemical Engineering programs along with the MS in in Petroleum Engineering and Chemical Engineering programs that were developed in the previous year.
- The Council of Deans approved in its meeting of March 6, 2014 the proposed BE in Mechatronics Engineering. The School filled all the forms and documentation that are required for the review and approval of the programs by the Ministry of Education and Higher Education.
- The feasibility of launching a Healthcare Systems Engineering graduate program was assessed by a Special Committee appointed by the SoE Dean. Due to the unfavorable survey results and market studies, it was decided not to pursue this endeavor.

2.7 SoE Career Office

During AY 2013-2014, the SoE Career Office worked closely with employers and the Career Guidance Office at LAU to seek and offer SoE students the best internships and career opportunities. This year, more students have used the opportunities created by our Career Office. For the period extending from September 2013 to June 2014, 62 internships are posted to students resulting in 115 interns placed through the career and placement office. Furthermore, the placement of graduates also increased this year; 135 companies offered 209 jobs and recruited 36 of our new graduates. The office assisted more than 70 students with resume writing and 20 students with preparing cover letters.

The career office maintains a database of SoE student employment status. For instance, this year **95.6%** of SoE students found a job or joined a graduate program within one year of graduation. The following table provides a useful summary of SoE career office activities.

Class of: Fal 12 – Spr 2013	Number of Graduates	Employed	Seeking Employment	Pursuing Graduate Degree	Unknown
Civil Eng'g	53	44	2	5	2
Computer Eng'g	27	20	0	7	0
Electrical Eng'g	10	7	2	1	0
Industrial Eng'g	12	10	0	2	0
Mechanical Eng'g	39	31	2	4	2
Total Graduates	141	112	6	19	4

The office organized the following on-campus interviews & Presentations:

1. Site Technology Information Session, 20 November 2013
2. ThyssenKrupp on campus interviews, 19 February 2014
3. Chamber of Engineers in Baden-Wuerttemberg & German Embassy in Lebanon, 17 March 2014
4. Schlumberger Presentation, 23 April 2014
5. Grey Matters -Dubai on campus interviews, 14 May 2014
6. Royal Institute of Technology (KTH), 2 April 2014
7. ASME, IIE and ASCE students' internships testimonials(28 & 29 November, and 18 December 13)

The SoE career office worked closely with the Career guidance office to post job listings on the LAU Career portal and share and update list of employers for the internship week and career fair. The office enhanced the online presence of the School of Engineering through social media.

2.8 Outreach Activities

The Office of the Dean engaged in several outreach activities with the goal to attract more qualified students, promote engineering education in the surrounding society, and engage SoE students in civic projects:

- The SoE embarked with IAESTE to offer internships abroad to our students. For the first year, the school sponsored 3 international students to come to LAU and perform research. These opportunities along with 4 others provided by the students themselves were exchanged with 7 opportunities. The destinations of these opportunities were Germany, Poland, Turkey, and Tunisia.
- The SoE participated in the Global Design for UNICEF Challenge, which is a competition that gives students the opportunity to work with UNICEF and come up with innovative solutions to pressing development problems. 13 teams from LAU completed the challenge. According to the UNICEF officials, the top 5 projects presented by LAU were by far the best ever presented and exceeded their expectations.
- The Office of the Dean organized the Engineering Projects Day on May 16, in which over 50 student projects were presented and displayed to fellow LAU students.
- ASEE Movie: The SoE was selected among 18 universities worldwide to be featured by the ASEE TV. The movie was mainly recorded on May 16, and was displayed during the

ASEE annual meeting in Indianapolis from June 15-18, 2014. The movie is available online on the ASEE TV (http://www.websedge.com/videos/asee_tv/#/).

- The assistant dean headed the LAU Sciences and Arts Fair organizing committee. Faculty and clubs from the SoE organized more than 7 engineering competitions in the Sciences Fair.
- The Engineers Without Borders (EWB) club was established in the fall13 semester. The club organized couple seminars and planed some works with Lebanese public schools.
- The SoE increased its participation in the You@LAU event that took place in Byblos from April 28 to May 2, 2014 and in Beirut from May 5-9, 2014. The SoE participated in a demonstration booth, scheduled lab tours, scheduled faculty office hours, and a five minute presentation in the opening to present the new Petroleum program and the under-enrolled Industrial program.

2.9 Staff

In AY 2013-2014, the School of Engineering had 11 Full-time staff members in addition to one part-time administrative assistant for our Beirut Operation.

2.10 Beirut Operation

The SoE continues to improve its presence on the Beirut campus. The SoE offered 21 introductory courses in Beirut. A part-time administrative assistant has been recruited in Beirut, and a full-time position is planned for academic year 2014-2015. The SOE current offices in Beirut are in Orme Gray Rooms 305 and 306. A new space plan, reallocating the Engineering Offices to Nicol Hall Ground Floor, will consider any additional space needs.

2.11 Other Activities

2.11.1 SoE Committees

The School of Engineering has a number of standing committees that assist the dean and other school administrators in the management of the school. The dean, assistant and associate deans, and chairs meet regularly in the advisory committee to discuss the daily operation of the school, monitor progress, develop strategies and approve departmental and other committee requests.

The SoE has five standing committees: academic, admissions', faculty affairs, research and faculty development, and student affairs. The main legislative discussions and recommendations of these committees are shown below and detailed summaries are provided in the appendix.

- **Academic committee** - Most of the work of this committee was pertained to petitions submitted by students. The most common theme was course overload, course substitutions, and repeats. Some curricular changes concerning course descriptions and pre-requisites were also addressed. A new undergraduate program in Mechatronics was approved.
- **Admissions' committee** – The committee hired a COE student assistant to implement an admissions' data automation tool. It was agreed to sample petitions over the 2013-2014

academic year in order to compare decisions between the old and the newly proposed criteria. The committee reviewed and recommended against adopting the Bridge program as is currently. The committee reviewed the Economics Baccalaureates policy and recommended to keep the same policy for fresh ES applicants; but to allow LAU students with ES baccalaureates to petition to transfer to Engineering after securing specific criteria.

- **Faculty affairs' committee** - The committee developed a questionnaire that aims at gauging the level of satisfaction of the faculty at the SoE with the current annual performance review process. The committee reviewed the dimensions underlying the existing yearly faculty performance appraisal process and recommended basing the process on three dimensions, namely, teaching, research, and services.
- **Research & faculty development committee** – The committee worked on developing new application forms for travel, research and summer grants to reflect changes in the SOERC Rules & Procedures.
- **Student affairs committee** – The committee developed and implemented new SAC elections policies and procedures and new guidelines for student engineering scholarship competition.

2.11.2 SoE software inventory

All programs submitted a list of their software to a central database. This database will be used to keep track of existing software and avoid redundancy.

2.11.3 Student awards

Mr. Abdallah Yabroudi, Board of Trustees Member and benefactor, agreed to resume the DCC – Syracuse University – LAU Internship Program commencing in the summer of the 2013-2014 academic year under different terms mutually agreed upon. In addition, Mr. Abdallah Yabroudi has graciously agreed to extend the current Gift Agreement to cover new student awards in addition to the existing ones. These awards include the HASAN ABDALLAH YABROUDI CIE DESIGN PROJECT AWARD, the SOE DEAN BEST ACHEIVEMENT AWARD and the CIE CHAIR TERM PAPER AWARD ON CURRENT ISSUES. The agreement will also provide financial support for three DCC FIELD TRIPS annually in Lebanon.

2.11.4 ASHA grant

During AY 2013-2014, the School of Engineering completed the procurement of the lab equipment under the 2012 ASHA grant in the amount of $500,000. The equipment consists of a Universal Testing Machine for the Civil Engineering department, an Automated Production Platform for the Industrial & Mechanical Engineering department, and a Robotic Arm System for the Electrical and Computer Engineering department.

DEPARTMENTAL REPORTS

3 CIVIL ENGINEERING REPORT

3.1 Overview

The Civil Engineering Program at LAU provides a well-rounded quality and challenging education with a solid theoretical background, training in the latest design methods, and proficiency in technological applications. We prepare our graduates to be technically competent, talented, creative, and ethically responsible engineers who are effective professionals in today's work environment. This enables them to enrich their lives and make valuable contributions to their communities. The program draws upon the broad resources of the comprehensive university that aspires to be among the top universities in the country and the region. We are making steady progress toward the realization of this goal.

Our curriculum is distinguished by offering seven courses with a separate industry-standard software laboratory to enhance the learning experience and improve the marketability of our graduates. As well, we offer six technical elective courses that allow the students to choose the area of emphasis depending on their own interests and current market needs. Our department is equipped with excellent teaching facilities, including high quality physical and computer laboratories with state of the art equipment and software packages to support the learning process. Our emphasis is the development of practical competence, critical thinking, passion for self-learning, as well as the capacity for teamwork and leadership. Our program offers liberal arts courses to prepare our students to be well-rounded individuals and teaches them to practice their profession with proper concern and attention to environmental, social and economic problems. Our professors are highly qualified experts in their fields and well recognized in the Lebanese market. They are engaged in exciting engineering research and development projects and they bring their expertise to the classroom. Our faculty are also active members of various professional societies and technical committees locally and abroad. They maintain a one-on-one relationship with our students, guide them to develop excellent work habits, and stress on the key factors needed for successful careers. Our graduates are highly sought after by employers. Our department has recently seen significant growth in the number of students, faculty and staff.

Our department offers opportunities for excelling students to receive merit scholarships dedicated from generous donors. Under partnership agreements, we offer training experience for some students as well as best achievement awards and best final year project awards. In addition, our students regularly participate in sponsored field trips.

3.1.1 Insights

The academic year 2013 - 2014 was marked by continued success and development of the CIE Department at LAU. Faculty, students, and staff have all contributed to our distinguished activities and achievements, which are summarized in this report. These include teaching and research activities, service to the university and the community, participation in development workshops and conferences, and awards and honors granted.

We had admirable achievements this year and we keep our focus on what's important as we work through other challenges and be confident in the future, because of the strengths we celebrate today. This has been a challenging and exciting year. We witnessed both the rewarding fruition of initiatives started a few years back and the foundation work for more departmental development in the years to come. It was a year in which we further solidified our efforts for ABET accreditation and strengthened our programs.

Through careful planning and strong commitment of our faculty and staff, our enrollment increased despite the challenges that the region has been facing. The Department has also been able to raise the admission scores, thereby improving the academic performance of students. The number of students placed in internships with civil engineering firms has grown. We have also seen our operating procedures and practices become documented and organized, which is a sure sign of a maturing organization. A new faculty member will join our department during next year at the tenure-track assistant professor rank, thus adding diversity to our instructional program and deepening our research profiles in the Transportation Engineering. Several students are planning to complete the Minor in Environmental Science which is a joint effort with the School of Arts and Sciences at LAU. During spring 2014, the Department had the three graduate students completed their M.Sc. requirements. Graduate students in the Department were granted graduate assistantship based on their performance and was on the average 50%. One of our graduate students received a full scholarship from Mr. Adballah Yabroudi. Our Program Advisory Council is meeting at least once a year and based on need.

Our undergraduate civil engineering students are regularly offered corporate sponsorships and internships abroad. Eight of our students are sponsored yearly by the Dubai Contracting Company to participate in an intensive internship program in Dubai, where they worked alongside peers from Syracuse University. We have also secured additional student internships, and provided them with industry-driven design FYP. Syracuse University in New York is willing to support two LAU fellows (Ph.D. studies or MS leading to Ph.D.) per year. Mr. Omar El Masri was selected to continue a fully paid Ph.D program at Syracuse University sponsored by Mr. Abdallah Yabroudi. Our Department is offering the students different awards including: Best Achievement Award, Best FYP Award, Best Term Paper Award, etc. We conducted sponsored field trips and organized lectures and participated in the organization of the workshops and projects.

Our laboratories are continuously maintained and equipment was updated. Major equipment were order through ASHA grants. The shaking table (about $123,000) was already received in June 2013 and training sessions were concluded in July 2013. A triaxial Testing Machine (about $125,000) was received in October and training was also held in the UK. Furthermore, the Department has ordered a Universal Testing Machine (about $270,000) through ASHA grant. This equipment will be received in summer 2014. In addition, the Department, through internal budgets, has ordered equipment and continuously maintained and calibrated existing ones.

Dr. Grace Abou-Jaoude has continued the second year of the grant under the Partnerships for Enhanced Engagement in Research (PEER) Program. Her proposal, entitled "Earthquake-

generated landslide hazard in Lebanon," rose to the top of a very strong pool of candidates. Dr. John Khoury has received a research grant from CNRS. Dr. Chatila has been successful in securing funding from EU Tempus call with about 108,000 euros. This project deals with the development of an interdisciplinary program on climate change and sustainability policy and there are partners with 15 other institutions.

The Department has some vacant faculty and staff lines. We already filled a newly developed position of a Laboratory Supervisor, who started in July 2013. We also recruited a Lead Laboratory Expert Technician Mrs. Salwa Najjar. Our faculty continue to progress in all scholarly aspects aiming at creating a quality environment of higher learning. Amidst our daily duties, our faculty, realize that our greatest challenge is success sustainability. We also realize that we still need to establish new programs and continuously assess our curricula. We are aware that our future depends on quality education, research and services to our beloved students. Some of our faculty have participated in the development of new programs at SOE and they participate in running these programs.

The mystery of the Civil Engineering Department at LAU reveals itself in our spirits, more fascinating the more we advance on the path of excellence, and the more we realize the magnitude of the mission each one of us has to accomplish. Nonetheless, we are anything but satisfied. We stress our continued commitment to the highest levels of excellence in both teaching and research, and our unyielding mission to continue impacting the new generation in positive and profound ways. We are proud of our past and excited about the future and we strive to become a premier Civil Engineering Program among peer institutions in the region.

3.1.2 Programs

The Department of Civil Engineering offers the following degree programs:

1. Bachelor of Engineering (B.E.) in Civil Engineering

   The Department provides a well-rounded quality and challenging engineering education that graduates dynamic and creative engineers. The program draws upon the broad resources of the comprehensive university that aspires to be among the top universities in the country and the region. The Department is committed to providing students with a solid theoretical background, training in the latest design methods and proficiency in technological applications. Our graduates go on to pursue varied careers in design, construction, management and research. We currently offer courses in the fields of: Construction Engineering, Environmental Engineering, Geotechnical Engineering, Surveying, Structural Engineering, Transportation Engineering, and Water Resources Engineering. We prepare our graduates to be technically competent, talented, creative, and ethically responsible engineers who are effective professionals in today's work environment. We keep them abreast of the latest technical software. This enables them to enrich their lives and make valuable contributions to their communities. The total number of credits required for graduation is 150. This includes six technical elective courses, and seven courses with a separate industry standard software laboratory. Elective courses allow students to choose the emphasis, depending on their own

interests and current market needs. Software courses enhance the learning experience and improve the marketability of our graduates. A typical schedule over a four-year period, including summer modules, is provided to students. However, they may elect to take these courses over a longer period of time.

2. Master of Science (M.S.) in Civil and Environmental Engineering

The Department of Civil Engineering at LAU offers a comprehensive program leading to the degree of Master of Science (M.Sc.) in Civil and Environmental Engineering (CEE) with one of three emphases: (i) Infrastructure and Construction Management; (ii) Environmental Science, Engineering and Management; or (iii) Engineering Mechanics. The CEE Program aims at attracting qualified students to pursue graduate studies. The program provides graduate students with a sound professional and academic training in civil engineering, giving them access to a variety of courses in their area of study, as well as the opportunity to conduct research, thus combining the theoretical and the applied aspects of civil engineering. The program is designed to stimulate independent thinking and ~~the~~ acquisition of knowledge, as well as the application of acquired knowledge and skills to the solution of practical engineering problems. The program provides an in-depth experience with one or more particular fields of Civil Engineering, while simultaneously exposing the student to cross-disciplinary issues and topics that affect the engineering and management of systems. Flexibility is a key benefit of this program as it allows students to plan their degree in line with their long-term career goals, and to be consistent with any professional experience and prior training they may have. The M.S. – CEE Degree may be completed with or without a thesis.

3. Minor in Environmental Science

The minor in Environmental Science (MES), which is ad*ministered jointly by the Department of Civil Engineering and the Department of Natural Sciences, i*s an interdisciplinary program, which gives students the opportunity to examine environmental issues from a variety of perspectives. The knowledge of environmental science major issues is central to theories and research in chemistry, biology, civil engineering, as well as social science, business, and public policy. The purpose of this program is to provide students with the broad conceptual framework of environmental issues and to offer a new global vision of this interesting discipline. A Minor in Environmental Science aims at providing quality education to interested students and enriching their knowledge in existing global environmental issues and problems. It is expected to expose them to important issues related to environmental problems and their causes, including but not limited to ecosystems and how they work, deforestation, loss of biodiversity, species extinction, air pollution, global warming, ozone depletion, solid waste disposal, and renewable energy. Concepts in environmental ethics, management and policies concerning preservation of the environment will also be provided. Additionally it covers topics related to the study of natural and non-natural chemical and microbiological substances in the environment and their transformations, ending with remediation to most of environmental pollution issues.

3.2 Personnel

3.2.1 Full-time faculty

There are nine full-time faculty members in the program, in addition to a newly recruited faculty who was supposed to join the Department as of Fall 2014. The Department depends on well-qualified part-time professionals to cover some courses. With the growth of the Program and the increase in enrollment, the number of the full-time faculty was increased to fully deliver the instruction commitments of the Program. Based on the budget rationale submitted, the Department requested new openings in areas such as construction engineering, transportation engineering, water resources, and environmental engineering. The CIE faculty is diverse in gender. The ranks of the full time faculty are as follows: one full professor, four associate professors, and four assistant professors.

The CIE faculties are qualified individuals in their respective areas to cover pertinent courses in the curriculum. Faculty members from other departments of the school or the university are also competent in delivering curricular areas of the program such as basic science, mathematics, humanities, social sciences, etc. with extensive teaching experiences. Outside the class time, faculty members maintain a one-to-one relationship with students. They are also active members of various professional societies and members of technical committees locally and abroad. Some faculty members provide service to the community and are active in providing technical consultations for engineering firms and governmental and non-governmental organizations. Nearly all faculty members are involved in research activities and publish their research regularly. They attend various workshops and seminars and present their research in international conferences. Our faculty body is characterized by exceptional professionals who are committed to the program with their full ethical and professional responsibilities. The competencies of the full time faculty members are as follows:

Dr. Caesar Abi Shdid, an Assistant Professor of Civil Engineering, received a B.E. in Civil Engineering from LAU; two M.S. degrees in Structural Engineering and in Construction Management, and a Ph.D. in Building Construction with a minor in Structural Engineering from the University of Florida. Before joining LAU, Dr. Abi Shdid served as an Assistant Professor of Construction Management at Georgia Southern University and a Senior Instructor of Civil and Environmental Engineering and Director of External Programs at Florida International University's (FIU) College of Engineering and Computing. He has taught graduate and undergraduate courses on a wide variety of Construction Engineering and Management, and Structural Engineering topics. In addition to over 30 journal and conference papers, Dr. Abi Shdid is the author of three course-specific textbooks published by Pearson Publishing Inc. Dr. Abi Shdid has been able to secure, in collaboration with other faculty, more than $700,000 of external research funding. Dr. Abi Shdid has served as a consultant and technical advisor for several corporations in the United States, and is the President and Owner of Phoenicia Engineering and Consulting PLLC—a FL licensed engineering and consulting firm. He is a licensed professional engineer (P.E.) in Florida, a registered Engineer in the Order of Engineers and Architects in Lebanon. He is also a member of the American Society of Civil Engineers (ASCE); a life member of American

Institute of Steel Construction (AISC); a member of the American Concrete Institute (ACI); and a life member of the Precast/Prestressed Concrete Institute (PCI). His research centers on the use of sensing technologies in construction and infrastructure assessment and the applications of artificial intelligence algorithms to predicting thermal lifecycle costs of buildings.

Dr. Grace G. Abou-Jaoude, an Assistant Professor of Civil Engineering, received a B.E. with distinction in Civil Engineering from AUB in 2001, a M.S. and a Ph.D in Civil Engineering in 2003 and 2006, respectively, from Purdue University. She joined the School of Engineering at LAU as a full-time faculty member in 2007. She is a registered member of the Order of Engineers in Lebanon, an associate member of the American Society of Civil Engineering, and a member of the International Society of Soil Mechanics and Geotechnical Engineering. She worked as a geotechnical engineer at Dar Al-Handasah (Shair and Partners) for almost three years before joining LAU. Her research interests are mainly foundation engineering, underground construction, pile dynamics, and soil-structure interaction. She recently received a grant from the Engineering Information Foundation in 2009.

Dr. Rita E. Awwad, an Assistant Professor of Civil Engineering, received a B.E. with high distinction from LAU (2004) an M.S. in Construction Engineering and Management (2005), an M.S. in Industrial and Operations Engineering (2008), and a Ph.D. in Construction Engineering and Management (2010) from the University of Michigan, Ann Arbor, USA. She is a registered engineer in the Order of Engineers and Architects in Lebanon. Her research interests include developing and simulating practical bidding models that can capture complexities of the construction market, application of artificial intelligence and neural networks to study contractors' strategies and simulate resources' interaction in construction operations, and investigation of dispute resolution alternatives. Dr. Awwad received the President's award upon graduating from LAU, the Distinguished Achievement award from University of Michigan, and several other awards.

Dr. Jean G. Chatila, an Associate Professor and Chair of the Department of Civil Engineering, holds a B.E. with distinction from AUB (1988), M.A.Sc. in Water Resources (1992) and a Ph.D (1997) in Environmental Hydraulics from the University of Ottawa. He has a strong academic background coupled with a proven research record and complemented by several years of industrial experience locally and internationally as well as administrative and managerial experience at different levels. He has carried out collaborative consulting and research with many organizations including Environment Canada, Public Works-Quebec, ESCWA-UN, INCO and MEDA EU Projects, Ministry of Energy and Water, Ministry of Environment, Development Alternatives INC. (DAI-USAID), Islamic Development Bank, Associated Consulting Engineers (ACE), municipalities, private sector companies, and NGOs. He has been instrumental in the design of many wastewater treatment plants in Lebanon and in the construction of a treatment facility for LAU's Byblos campus. With his support and guidance, students at LAU have participated in many design projects and workshops in the areas of water and wastewater management. Dr. Chatila is the Director of the Institute for Water Resources and Environmental Technology at LAU. The Council of Ministers has appointed Dr. Chatila as member of the Board of Directors for Southern Lebanon Water and

Wastewater Establishment since 2002. He is a recipient of many grants, awards and scholarships.

Dr. Camille A. Issa, a Professor of Civil Engineering, received a BS and MS in Civil Engineering from Mississippi State University in 1980 and 1982 respectively, and a Ph.D. in Structural Engineering from Virginia Polytechnic and State University in 1985. In 1993, he joined the Lebanese American University (LAU) as an Associate Professor of Civil Engineering where he served as the Founding Chair of the Department from 1995 to 2001. In 2001, he was promoted to the rank of Full Professor of Civil Engineering. Previous to joining LAU, he had served as an Assistant Professor from 1985 to 1990 and Tenured Associate Professor from 1990 to 1993 at Mississippi State University. During his academic career in the US, he was able to secure research funds from several US Governmental Agencies (NASA, NSF, US Army, etc.) and private firms. He also had served and chaired several university related councils and committees dealing with a wide range of academic issues that included Accreditation, Curriculum, and Faculty Governance. He also was recognized by different honorary societies and had joined several engineering professional organizations and has actively served on several Technical Committees. He had supervised nine MS and one Ph.D. student. Dr. Issa is a first class Engineering Educator and has been elected by ASCE to the rank of Fellow in 1997. He is actively involved in academic shared governance at LAU, where he has served as a member or chair of several committees and had recently the honor to serve as the Founding Chair of the LAU Faculty Senate in 2006. His commitment to a full fledge academic career is second to none and he is credited with the supervision over hundred Final Year Projects for the Professional Degree in Engineering. He is professionally registered engineer in both the USA and Lebanon and engages in private consulting. Dr. Issa is credited with over seventy scholarly articles published in the form of technical papers in journals, conference proceedings, research reports, and chapters in books.

Dr. Gebran N. Karam, an Associate Professor of Civil Engineering holds a B.E. (with distinction) from AUB, an SMCE (1990) and a Ph.D. in Materials and Structures (1994) from M.I.T. Dr. Karam joined the faculty in 1995 as an Assistant Professor and has contributed to the founding of the Department and the School. A proven researcher, he has worked on biomimetics, FRP strengthened concrete, modeling of confined geomaterials, modeling of large masonry structures, GPS monitoring of plate tectonics, and air pollution management. He has carried out and participated in multiple collaborative projects in applied research and industrial development funded by USAID, UNAVCO, UNIDO, EU, LCNRS for a total value in excess of USD 1.1million. He has been actively involved in academia- industry support projects such as quality management training, ISO certifications, SMEs development, packaging quality and control. Dr. Karam has over 15 years of experience in engineering practice in the fields of infrastructure consultancy locally and internationally working for institutional and governmental clients. He has participated in the design, supervision and quality control of roads, ports, dams, water and wastewater networks, and rural development projects. He brings his managerial and professional experience into the classroom offering the students exposure to real life situations and contemporary issues. Dr. Karam has served on many official committees, advisory bodies, and NGO boards. He is currently member of the National Working Group on Metrology, and a founding member of LibanPack, the Lebanese packaging industry center.

Dr. John Khoury, is an Assistant Professor, holds a B.E. with high distinction from LAU (2002), a M.S. (2003) and a Ph.D. (2005) in Civil Engineering (Transportation Focus) from Virginia Polytechnic Institute and State University. He is a registered Professional Engineer (P.E.) in the State of California, a registered Professional Traffic Operations Engineer (PTOE) in the USA, and a member of international professional societies. His research interests are mainly focused on Intelligent Transportation Systems (ITS), risk assessment of design criteria, and regional planning solutions. He is experienced in planning, traffic operations, mass transit systems, and air transportation systems. Before joining LAU, Dr. Khoury joined CH2M Hill as a traffic lead and project manager for over four years.

Dr. Mazen R. Tabbara, an Associate Professor of Civil Engineeirng, received a B.E. in Civil Engineering from AUB in 1981, an M.S. from Stanford University in 1982 and a Ph.D in structural engineering from Northwestern University in 1990. Dr. Tabbara joined LAU as a full-time faculty member of civil engineering in 1998. Since 2006, he has been serving as Assistant Dean of the School of Engineering. From 2002 to 2004, he also served as Chair of the Civil Engineering Department, and in 2001 as Acting Chair. Dr. Tabbara's background in the technical domain includes: (1) Three years of industrial experience as a structural engineer at Dar Al-Handasah Consultants, and (2) Seven years of pure research experience: four years at Northwestern University as a postdoctoral fellow and three years at Sandia National Laboratories (Albuquerque, New Mexico) as a senior member of the technical staff. Throughout his current work at LAU and his previous work at Northwestern University and Sandia National Laboratories, Dr. Tabbara has focused on computer simulations (or modeling) of physical engineering problems. This has included developing new numerical techniques, writing various special purpose codes, and applying industry-standard (or off-the-shelf) codes to a wide range of problems. The topics that Dr. Tabbara has worked on include: quasi-static and dynamic fracture, strain localization, projectile penetration of targets, FRP wrapped concrete columns, structural analysis and design, material modeling of actively confined concrete under compression, post-earthquake survival of archeological monuments, flow of water over spillways, stability of earth slopes, and transport of air pollutants.

Dr. Mahmoud Wazne, an Associate Professor of Civil Engineering, earned his Bachelor and Master degrees in Civil Engineering from Columbia University and his PhD degree in environmental engineering from Stevens Institute of Technology. He served as an assistant professor and as the Director of W. M. Keck Geo-environmental Laboratory at Stevens Institute of Technology before joining LAU in fall 2012. His research interest includes environmental remediation and fate and transport of contaminants in soil and aqueous media.

3.2.2 Summary of full-time and part-time faculty

The composition of the faculty members (full- and part-time) by their area of expertise is shown in the following table. Each area (Construction, Environmental, Geotechnical, Structures, Transportation and Water Resources) has at least two faculty members and is not critically dependent on one individual. The table shows the faculty status, licensure, and specialization according to Area.

Area	Faculty Name	Status (FT / PT)	Professional Licensure
Construction	Rita Awwad	FT	Lebanon
	Caesar Abi Shdid	FT	USA
	Gebran Karam	FT	Lebanon
	Dr. Ghassan Zihri		Lebanon
	Maya Feghali	PT	Lebanon
Environmental	Jean Chatila	FT	Lebanon
	Mahmoud Wazne	FT	Lebanon
	Mazen Haydar	PT	Lebanon
	Carmen Baroudy	PT	Lebanon
	Karim Khoury	PT	Lebanon
Geotechnical	Grace Abou Jaoude	FT	Lebanon
	Gebran Karam	FT	Lebanon
	Khaldoun Nasreddine	PT	Lebanon
	Dory Bitar	PT	Lebanon
	Samer Hassan	PT	Lebanon
	Lt. Hussein El Annan	PT	Lebanon
Structural	Camille Issa	FT	Lebanon / Mississippi
	Gebran Karam	FT	Lebanon
	Mazen Tabbara	FT	-----
	Caesar Abi Shdid	FT	USA
	Elie Awwad	PT	Lebanon
	Manale Hallany	PT	Lebanon
	Fatima El Meski	PT	Lebanon
	Nadim Diab	PT	Lebanon
	Ziad Azzi	PT	Lebanon
	Amer El Souri	PT	Lebanon
	Michael Ammoury	PT	Lebanon
	Mohammad Khatib	PT	Lebanon
	Omar El Masri	PT	Lebanon
Transportation	John Khoury	FT	California, U.S.A.
	Najib Gergis	PT	Lebanon, Florida, U.S.A.
	Ziad Azzi	PT	Lebanon
	Rabih Khatib	PT	Lebanon
Water Resources	Jean Chatila	FT	Lebanon
	Mahmoud Wazne	FT	-------
	Najib Gergis	PT	Lebanon
	Omar Melhem	PT	Lebanon
	Ghassan Mikati	PT	Lebanon
	Elias Daoud	PT	Lebanon
	Ziad Azzi	PT	Lebanon

3.2.3 Non-teaching staff

Ms. Stephany El Bitar, B. S
Academic Assistant of the Department of Civil Engineering

Mr. George Chaccour, B.E., MBA
Lab Supervisor

Mrs. Salwa Salloum Najjar, B.E., MBA
Civil Engineering Lab Lead Technician

Mr. Tarek Taisoun, B.S., M.S.
Lab Technician – part time

3.3 Students

3.3.1 Enrollment

In AY 2013-2014, 112 students were enrolled in the civil engineering department, distributed as follows:

	Received Applications	Accepted Applications	Enrolled Applicants	Acceptance Rate	Yield Rate
Fall 2013					
BE-CVLENG	283	228	99	80.6%	43.4%
MSE-CVLEE	9	4	4	44.4%	100.0%
LAU Total	**292**	**232**	**103**	**79.5%**	**44.4%**
Spring 2014					
BE-CVLENG	30	14	9	46.7%	64.3%
MSE-CVLEE	**0**	**0**	**0**	**0.00%**	**0.00%**
LAU Total	**30**	**14**	**9**	**46.7%**	**64.3%**

Enrollment by status, divided through both campuses, Beirut and Byblos is as follows:

ENROLLMENT BY STATUS							
		Fall 2013 (Census Date)			Spring 2014 (Census Date)		
		Headcount	Credit-hr	FTE	Headcount	Credit-hr	FTE
Beirut Campus							
BE-CVLENG	Full-Time Students	43	658	43.87	37	588	39.20
	Part-Time Students	0	0	0.00	1	9	0.60
	Total Students	43	658	43.87	38	597	39.80
Total By campus		**43**	**658**	**43.87**	**38**	**597**	**39.8**
Byblos Campus							
BE-CVLENG	Full-Time Students	443	7,264	484.27	422	6,954	463.60
	Part-Time Students	11	83	5.53	12	100	6.67
	Total Students	454	7,347	489.80	434	7,054	470.27

ENROLLMENT BY STATUS								
		Fall 2013 (Census Date)			Spring 2014 (Census Date)			
		Headcount	Credit-hr	FTE	Headcount	Credit-hr	FTE	
MSE-CVLENG	Full-Time Students	2	21	2.33	3	30	3.33	
	Part-Time Students	5	24	2.67	4	21	2.33	
	Total Students	7	45	5.00	7	51	5.66	
Total By campus		**461**	**7392**	**494.8**	**441**	**7105**	**475.93**	
University Wide								
BE-CVLENG	Full-Time Students	486	7,922	528.14	459	7,542	502.80	
	Part-Time Students	11	83	5.53	13	109	7.27	
	Total Students	497	8,005	533.67	472	7,651	510.07	
MSE-CVLENG	Full-Time Students	2	21	2.33	3	30	3.33	
	Part-Time Students	5	24	2.67	4	21	2.33	
	Total Students	7	45	5.00	7	51	5.66	
Total By campus		**504**	**8050**	**538.67**	**479**	**7702**	**515.73**	

3.3.2 Student Employment

During the year 2013-2014, students from various majors were assigned to work in the CIE department and in Labs, as assistants to the professors.

Graduate Assistantships (GA) were granted to many students in Fall 2013 and Spring 2014 for the academic year of 2013-2014. GA tasks included assisting in courses, labs, as well as in various departmental tasks.

3.3.3 Graduation

76 undergraduate students were granted the Bachelor of Engineering (BE) degree, major Civil Engineering (CIE), in AY 2013-2014, as listed in the following table:

Requirements completed in summer 2013		
Michel Joseph Abdo	Bilal Ibrahim Diab	Rami Bahij Hawi
Mohammad Yehya Agha Kasbah	Fawaz Sultan El Arab	Jamil Ahmad Manana
Jad Ahmad Atwe	Mohammad Hamid El Hattab	Jad Mohammad Shayya
Patrick Pierre Chehwan	Ralph Nabil Harfouche	
Requirements completed in fall 2013		
Rima Joseph Abi Saad	Charbel Abdo El Khoury	Elie Elias Mouarrek
Charbel Joseph Abi Chebel	Patrick Nadim El Murr	Michell Elias Nakhle Dit El Ghorr
Stephanie Zakhya Bassil	Tarek Gergi Farah	Vernon Elie Nassar
Joseph Antoine Chahoud	Mazen Mustapha Haidar	William Charles Skaff
Patricia Napoleon Dargham	Jad Charbel Hareb	Habib Kamal Younes
Antonella Antoine El Bared	Helene Nicolas Kassouf	Haidar Saleh Melhem Youssef
Roula Salah El Hachem	Patrick Ghassan Khairallah	Sarah Marwan Zgheib
Reham Mohamad El Irani	Josephe Rafic Maroun	Johnny Elias Zoghbi
Anthony Charbel El Khoury Hanna	Marc Edgard Maroun	
Requirements completed in spring 2014		
Mirla Jean Abi Aad	Zein Saeed Dawi	Maggie Bahij Khaddaj
Georges Sami Abi Saad	Hady Sami El Hachem	Salim Ziad Khattar

Sultan Jihad abu Lteif	Omar Adel El Souki	Ziad Khaled Mourad
Sharbel Youssef Al Bayeh	Sana Najib El Kalash	Jamil Said Riachi
Imad Toufic Al Halabi	Chadi Hussein Fawaz	Moustafa Marwan Saab
Khaled Ali Alaydi	Guilaine Kalim Ghoussoub	Izak Melhem Said
Ali Mehdi Ali Hassan	Mostapha Hassib Haidar	Moufid Labib Said
Hayfaa Haissam Asaad	Rudy Christian Hajjar	Elias Makarios Saleme
Rita Boulos Assaker	Sarah Walid Hariz	Samer Salim Shahine
Rawan Fady Bechara	Ralph Kamal Hejeily	Lara Bassem Shaya
Saad Milad Breidy	Lili Hanna Helou	Samer Mahmoud Slika
Fabienne Marwan Chedid	Melanie Gerges Jabbour	Cynthia Antoine Souhaid
Mabel Antoine Chedid	Ali Mohammad Kaddah	Robert Ibrahim Zaarour

3.3.4 Student engagement

The SoE Student Affairs Committee provides an important forum through which students' needs and concerns are addressed. The CIE program is represented by one elected member. Also, the CIE student representative meets regularly with the Department Chair to discuss relevant concerns and requests.

In addition, the Department decided to hold meetings with the students at least once a semester, which are attended by all CIE students and program faculty as well.

The faculty decided to hold orientation meetings with first-year students. These meetings are attended by the Chair and faculty and they provide the forum for orientation. During these meetings, student concerns and requests are listened to and acted upon after deliberation in the departmental meetings. These meetings will build on the orientation sessions offered at the university level for the benefit of students. Moreover, faculty maintains an open door policy with the students. They act as mentors who guide them and assist them in selecting senior year courses that provide appropriate preparation given the students' interests and goals. They may discuss other opportunities such as research or internship involvement as well as graduate studies.

3.3.5 Career and academic advising

The program has provided good advising opportunities to all students. Advising is a critical step to successfully meet the program objectives, enforce procedures, and assure that all students meet the program requirements. At the start of the matriculation in the program, students are assigned an academic advisor who is a full-time faculty member. The advisor provides guidance and assistance in various aspects related to the academic performance of the students and their future careers in industry or graduate school. Besides, students have direct access to their advisors. Currently all students are required to meet with their advisors at least once a semester for career, academic, performance and registration advising. Although the setup was already in effect, faculty decided to improve on the process. This process is now documented and a student file is created. As of spring 2013, the student advising file is saved electronically on CAPP.

3.3.6 Exit Survey

In order to improve the response rate for the exit survey, the Department decided that the "exit survey" should be filled by students who have completed their FYP.

3.3.7 Office Practice Survey

To improve the response rate for the professional experience survey, the "Office Practice Surveys" (Student and Employer) are submitted by hand (sealed envelopes) to the instructor of the course before the grade is issued. It is the responsibility of the student to secure the completed employer (supervisor) survey. Both surveys are given to students at the beginning of the internship and are paper based.

3.3.8 Employer and Alumni Databases

The Department has established and implemented a system to keep better track of our alumni and their employers with the assistance of a Department academic assistant. Currently, both databases are maintained and updated regularly. Alumni and employers surveys are deployed in order to gather data. In order to improve the response rate, reminders are sent electronically followed by phone calls to encourage alumni and employers to complete the surveys.

3.4 Research

3.4.1 Journal publications

1. Assaad, Joseph J., and **Issa, Camille A.**, "Rheological Properties of Cement Pastes Containing Amine- and Glycol-Based Grinding Aids", Accepted, *Advances in Cement Research*, Vol. 25, Appeared online, 14 pages.
2. Assaad, Joseph J., and **Issa, Camille A.**, "Mechanisms of Strength Loss in Underwater Concrete", *Materials and Structures*, Vol. 46, No. 10, October 2013, pp. 1613-1629.
3. **Issa, Camille A.**, and Salem, George, "Utilization of Recycled Crumb Rubber as Fine Aggregates in Concrete Mix Design", *Journal of Construction and Building Materials*, Vol. 42, May 2013, pp. 48-52.
4. Hajali, M. and **Abi Shdid, C.**, "Experimental and Numerical Analysis of the Tensile Test on the A633 HSLA Steel Plate Specimens with Edge Crack", *Journal of Engineering Science and Technology* (in print).
5. Hajali M., and **Abi Shdid, C.**, "Continuous Measurement of Drilled Shaft Diameter during Construction Using NDT Method", *Journal of Performance of Constructed Facilities*, ASCE (in print).
6. Younes, C., **Abi Shdid, C.**, "An Enhanced Model for Combined Heat and Air Infiltration Energy Simulation", *Journal of Building Physics*, SAGE, Vol. 37, No. 4, pp 267-302, April 2014.
7. Hajali, M., and **Abi Shdid, C.**, "Determination of the Two-Dimensional Plastic Zone Shape and SIF at the Crack Tip Using RKPM", *Journal of Iron and Steel Research International, Elsevier.* Vol. 20, No. 12, pp. 103-114, December 2013.

8. Younes, C., **Abi Shdid, C.**, "A Methodology for 3-D Multiphysics CFD Simulation of Air Leakage in Building Envelopes", *Journal of Energy and Buildings, Elsevier,* Vol. 65, pp. 146-158, October 2013.
9. Hajali, M. and **Abi Shdid, C.**, "Comparison between Visibility and Diffraction Criteria on SIF and J-integral Value for Mode I Crack Using RKPM", *Journal of Structures, Hindawi Publishing Corporation,* Vol. 2013, Article ID 978684, pp. 10, October 2013.
10. Ghauch, Z. and **Abou-Jaoude, G.,** (2013) "Strain response of hot-mix asphalt overlays in jointed plain concrete pavements due to reflective cracking"*, Computers and Structures*, 124 (2013), 38-46.
11. Karachalios, A., **Wazne, M.**, "Phosphate removal from water by modified pine bark using ionic liquid analog", *Desalination and Water Treatment*, (ACCEPTED).
12. Grubb, D. G., Jagupilla, S. C., Cummings, R., **Wazne, M.,** "The immobilization of lead, tungsten and phosphate by steel slag fines: metals thresholding and rate studies", *ASCE Journal of Hazardous, Toxic, and Radioactive Waste*, (ACCEPTED).

3.4.2 Conference publications

1. **M. Tabbara** & A. El Howayek, "Finite element evaluation of the stress field in a slope stability analysis", accepted for presentation in the *8th European Conference on Numerical Methods in Geotechnical Engineering (NUMGE 2014)*, in Delft, The Netherlands.
2. **Awwad, R.**, and Ammoury, M., "Surveying BIM in the Lebanese Construction Industry", Proceedings of the *International Symposium for Automation and Robotics in Construction (ISARC)*, Canada, August 11-15, 2013.

3.4.3 Manuscripts

1. Smaili, Ahmad, and **Issa, Camille**, "Finite Element in Engineering Design", Manuscript of a book to be submitted for publication, 1990-Present.
2. **Issa, Camille**, "ACI Reinforced Concrete Design: Empirical & MKS Units", Manuscript of a book to be submitted for publication, 2000-Present.

3.5 Course Offering

3.5.1 Courses offered

The following table includes the civil engineering courses offered by the department for the AY 2013 – 2014 along with the related information on enrollment and instructors.

Course Number and Title	Level	Cr	Instructor	No. Sec.	Total Size
Fall 2013					
CIE 200 Statics – Beirut	UG	3	A. El Souri, F. El Miski	2	72
CIE 200 Statics – Byblos	UG	3	C. Issa, M. Tabbara, N. Diab	4	149
CIE 202 Mechanics of Materials - Byblos	UG	3	N. Diab	1	42
CIE 302 Structural Analysis	UG	3	M. Tabbara, C. Shdid	4	147
CIE 303 Structural Analysis I- Soft	UG	1	M. Hallani	6	124
CIE 308 Construction Materials	UG	3	G. Karam, E. Awad,	3	129
CIE 309 Construction Materials Lab	UG	1	M. Ammoury, Z. Azzi	7	126
CIE 320 Fluid Mechanics	UG	3	M. Wazne, O. Melhem	3	132
CIE 321 Fluid Mechanics Lab	UG	1	T. Tekirian, , Z. Azzi	8	116

Course Number and Title	Level	Cr	Instructor	No. Sec.	Total Size
CIE 322 Hydraulics	UG	3	O. Melhem	1	24
CIE 361 Surveying	UG	2	G. Mikati	1	22
CIE 362 Surveying – Lab	UG	1	M. Feghali	2	20
CIE 424 Water Distribution and Treatment	UG	3	J. Chatila, M. Wazne	3	112
CIE 425 Environmental Engineering Lab	UG	1	K. Baroudy	6	111
CIE 434 The Civil Engineering Profession	UG	2	G. Karam	2	55
CIE 436 Detailing for Civil Engineering	UG	2	M. Al Khatib	4	78
CIE 444 Soil Mechanics	UG	3	K. Nasreddine, D. Bitar	3	130
CIE 445 Soil Mechanics Lab	UG	1	O. El Masri	6	110
CIE 460 Highway Eng.	UG	3	J. Khoury	2	83
CIE 461 Transportation Eng. Soft	UG	1	R. Khatib	4	65
CIE 480 Civil Eng'g Mg't Fundamentals	UG	3	R. Awwad, L Ghehchan	3	95
CIE 512 Concrete Structures II	UG	3	C. Issa	1	32
CIE 525 Envir. Policy & Management	UG	3	M. Haydar	1	29
CIE 582 Infrastructure Management	UG	3	G. Karam	1	38
CIE 585 Risk & Natural Hazard Managt	UG	3	G. Zihri	1	34
CIE 600A Irrigation & Drainage	UG	3	G. Mikati	1	42
CIE 600 N Airport Plan. & Des.	UG	3	J. Khoury	1	28
CIE 600 O Construction Safety	UG	3	C. Abi Shdid	1	40
CIE 600 P Construction Methods	UG	3	R. Awad	1	29
CIE 600 Q Reinforced Masonry Des	UG	3	C. Abi Shdid	1	35
CIE 600 R Traffic Engineering	UG	3	J. Khoury N. Gerges	1	42
CIE 601 Project I	UG	3	CIE faculty		41
CIE 730 Irrigation & Drainage	G	3	G. Mikati	1	2
CIE 782 Infrastructure Management	G	3	G. Karam	1	3
CIE 785 Risk & Natural Hazard Mang't	G	3	G. Zihri	1	1
CIE 790 Construction Methods	G	3	R. Awad	1	2
CIE 799A Airport Plan. & Design	G	3	J. Khoury	1	3
CIE 799B Construction Safety	G	3	C. Abi Shedid	1	3
CIE 799C Reinforced Masonry Des.	G	3	C. Abi Shdid	1	2
CIE 899 Internship Schedule Type	G	0		1	1
Spring 2014					
CIE 200 Statics – Beirut	UG	3	F. El Meski	1	22
CIE 200 Statics – Byblos	UG	3	M. Tabbara, O. Melhem	2	61
CIE 202 Mechanics of Materials - Beirut	UG	3	F. El Meski	1	31
CIE 202 Mechanics of Materials - Byblos	UG	3	N. Diab	2	74
CIE 302 Structural Analysis I	UG	3	M. Tabbara	1	54
CIE 303 Structural Analysis I - Soft	UG	1	M. Hallany	2	27
CIE 304 Stress Analysis	UG	3	G. Karam, E. Awad	3	152
CIE 305 Stress Analysis – Lab	UG	1	O. El Masri, Z. Azzi	8	146
CIE 306 Concrete Structures I	UG	3	C. Issa, E. Awad	3	129
CIE 307 Concrete Structures I - Soft	UG	1	M. Ammoury	6	125
CIE 320 Fluid Mechanics	UG	3	O.Melhem, A. Sfeir	2	58
CIE 321 Fluid Mechanics - Lab	UG	1	Z. Azzi	2	34
CIE 322 Hydraulics	UG	3	M. Wazne	2	99
CIE 323 Hydraulics - Soft	UG	1	E. Daoud	5	91
CIE 361 Surveying	UG	3	G. Mikati	2	60
CIE 362 Surveying Lab	UG	1	M. Feghali, , Z. Azzi	4	61
CIE 400 Steel Structure	UG	3	C. Abi Shdid	2	79
CIE 424 Water Distribution & Treatment	UG	3	M. Wazne	1	45

Course Number and Title	Level	Cr	Instructor	No. Sec.	Total Size
CIE 425 Enviromental Eng. Lab	UG	1	K. Baroudy	1	18
CIE 426 Wastewater Collection & Treatment	UG	3	J. Chatila	2	85
CIE 427 Environmental Engineering	UG	1	K. El Khoury	4	79
CIE 434 The Civil Engin'g Profession	UG	2	G. Karam	1	20
CIE 436 Detailing for Civil Engineers	UG	2	M. Al Khatib	1	12
CIE 444 Soil Mechanics	UG	3	D. Bitar	1	39
CIE 445 Soil Mechanics Lab	UG	1	H. Al Hannan	2	33
CIE 446 Foundation Engineering	UG	3	G. AbouJaoudé, K. Nasreddine	3	120
CIE 447 Geotechnical Eng. Soft	UG	1	S. Hasan,	6	121
CIE 460 Highway Enginnering	UG	3	J. Khoury	1	43
CIE 461 Tranport. Enginnering	UG	1	E. El Khatib	2	33
CIE 465 Transportation Systems Eng.	UG	3	J. Khoury	2	84
CIE 485 Construction Management	UG	3	R. Awwad	2	87
CIE 486 Construction Management –Soft	UG	1	M. Feghali	4	85
CIE 498 Proffesional Experrience	UG	6	J. Chatila	1	8
CIE 520/720 Solid Waste Management	UG	3	M. Haydar	1	32
CIE 521 Hydrology	UG	3	J. Chatila, N. Gerges	1	20
CIE 522 Environmental Impact Assessment	UG	3	M. Haydar	1	35
CIE 540 Adv. Geotechnical Engineer'g	UG	3	G. AbouJaoudé	1	17
CIE 586 Constuc. Decis. Under Uncert.	UG	3	G. Zihri	1	35
CIE 587 Construction Cost Engineering	UG	3	R. Awwad	1	11
CIE 600C GIS & Remote Sensing	UG	3	G. Mikati	1	29
CIE 600I Top. CIE: Advanced Concrete Des.	UG	3	C. Issa	1	14
CIE 601 Project I	UG	3	CIE faculty	1	31
CIE 602 Project II	UG	3	R. Awwad, C. Issa	1	3
CIE 709 Top. CIE: Advanced Concrete Design	G	3	C. Issa	1	2
CIE 720 Solid Waste Management	G	3	M. Haydar	1	1
CIE 722 Environmental Impact Assessment	G	3	M. Haydar	1	2
CIE 788 GIS & Remote Sensing	G	3	G. Mikati	1	1
CIE 799D Top. CIE: Cons. Dec. Under Uncert	G	3	G. Zihri	1	4
CIE 799E Top. CIE: Construction Cost Eng.	G	3	R. Awwad	1	1
CIE 799F Top. CIE: Adv, Geotechnical Eng.	G	3	G. Abou Jaoude	1	1
CIE 899 Thesis	G	6	C. Abi Shdid, C. Issa	1	1
Summer I 2014					
No CIE courses were offered in Summer I					
Summer II 2014 (planned)					
CIE 361 Surveying	UG	2		1	36
CIE 362 Surveying - Lab	UG	1		2	36
CIE 498 Professional Practice	UG	6	J. Chatila	4	76

3.5.2 Laboratory session size

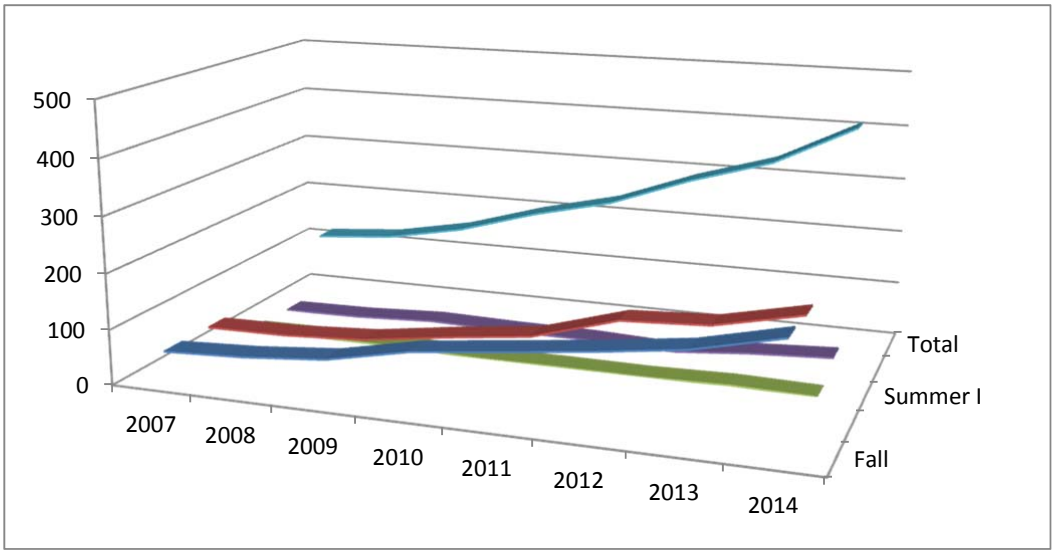
Prior to the completion of the Engineering Laboratory Building, the limitation in laboratory space led the Department to limit the laboratory class size to 15 students in order to improve on the student learning opportunities and ensure more safety in the laboratories. In addition, and since safety is of major importance, the Department decided not to schedule concurrent laboratory sessions with the CIE425 Environmental Engineering Lab.

3.5.3 Credits offered

The Byblos data for the number of credits offered in an academic year showed considerable increase. The following table shows the number of credits offered from 2007 till 2014 by semester and for the whole year.

The same data is also depicted in a chart that shows a significant growth in the number of credits offered from year to year. This growth shows a tremendous increase in the number of courses given, respectively with the number of credits given during each semester trying to meet all student needs.

Term	2007	2008	2009	2010	2011	2012	2013	2014
Fall	55.5	62.5	75.5	106.5	123.5	141	161.5	197
Spring	54.5	56	64.5	85.5	103.5	148	156	189
Summer I	4	5.5	5	0	1	0	3	0
Summer II	1	3	10	7	6	0	13.5	22
Total	115	127	155	199	234	289	334	408



3.5.4 Summer Training 2013 – 2014

Civil Engineering Students are required as part of their studied to undergo a professional Training Experience (CIE 498 – Professional Experience). This experience consists of an intensive 6 weeks training with a professional organization that provides opportunities for training and exposure to the real Engineering world. Students are required to prepare a written report describing their experience.

Eight students from LAU had the opportunity to participate in different internships programs, as DCC internship that is offered by Dr. Abdallah Yabroudi.

3.6 Activities

3.6.1 Professional activities and services

Dr. Grace Abou Jaoude

- Active member in the meetings of the Lebanese Geotechnical Engineering Society at the Order of Engineers and Architects in Beirut.

Dr. Caesar Abi Shdid

- Reviewer for the following Journals: Journal of Construction Engineering and Management; Journal of Energies; Journal of Computing in Civil Engineering; Journal of Computer Aided Civil and Infrastructure Engineering; Taylor and Francis Text Book Publications.

Dr. Rita Awwad

- Reviewer for the Journal Construction Engineering and Management (ASCE) and for ISARC 2014 conference to be held in Sydney, Australia, 2014; and as a reviewer and a session chair at the ISARC 2013 conference, Montreal, Canada, August 2013.

Dr. Jean Chatila

- Appointed by the Council of Ministers as member of the Board of Directors for Southern Lebanon Water and Wastewater Establishment in 2002 and continues to serve in that capacity.

Dr. Camille Issa

- Selected as an Editorial Board Member of "The Open Construction and Building Technology Journal", Bentham Science Publishers, Ltd, 2008- Present.
- Reviewer for Journal of Construction & Building Materials and Journal of Engineering Structures.
- Regional Coordinator, CIB Working Commission W63: Affordable Housing, Middle East Region, 1997 - Present.
- Member, Engineering Committee of "The Greek Orthodox Archbishop of Tripoli, Al-Koura, and Surroundings", 1996 – Present
- Chief Project Engineer, "Saint George Cathedral", Deddeh Al-Koura, Church Council.
- Member, SEI/ASCE Standards Committee for Structural Condition Assessment and Rehabilitation of Buildings, 2004- Present
- ABET Civil Engineering (ASCE) Program Evaluator, 2010-Present
- ASCE/SEI Committee on Structural Safety and Reliability, 2008-2013
- Reinforced Concrete Consultant on Greek Orthodox Cathedral in Tripoli, 2009-Present

Dr. John Khoury

- Reviewer for the Transportation Research Board – Highway Capacity and Quality of Service Committee AHB40 and Highway Design Committee (AFB20); and Computer Aided Civil and Infrastructure Engineering Journal.
- Consulted for CH2M HILL, managed transportation projects, done feasibility studies, designed major intersection networks, planned freeway corridors, Summer 2012.

3.6.2 Outreach activities

- **Dr. Rita Awwad** served on the team of advisors for the Holcim Competition Award for students during Fall 2013. Academic coordinator and advisor for USAP students enrolled

in Civil Engineering program (responsible for advising and monitoring the progress of students through preparing progress reports every 6 weeks). Reviewed material for DSLIP program: provided and discussed additions to the curriculum that were approved and implemented by DCC.

- **Dr. Jean Chatila** is a member of the Parish Council of St. Mary's Orthodox Church of Dormition (Niah), Hamra, Beirut, 2012 – present; and is the chair of the Land and Buildings Committee at St. Mary's Orthodox Church of Dormition (Niah), Hamra, Beirut, 2012 – present. Participated in the development of the technical elective course with DCC. Director of the Institute for Water Resources and Environmental Technology (IWRET) at LAU since October 2001.
- **Dr. Camille Issa** is a member of the Lions Clubs, Member (since 1994), Immediate Past President (2012-2013) ,President (2011-2012), First Vice-President (2010-2011), Treasurer (1995-2000, 2009-10, 13-14), Second Vice-President (2001-2002), and First Vice-President (2002-2003), President (2003-2004), Immediate Past President (2004-2005) of "Al-Koura Lions Club"; and a warden, US Embassy, Beirut, Lebanon, 2003-Present.
- **Dr. John Khoury** acted as the Faculty advisor to the Civil engineering club at LAU (Actively involved in ASCE Lebanon Group events (preparation and funding) –Treasurer. He helped plan first ASCE gathering at Order of Engineers, Beirut and helped plan and organize ASCE first annual meeting at Monroe Hotel, Beirut. CIE Department Representative for You@LAU Committee: CIE department representative. Academic Coordinator for LAU – USP II : SOE-CIE department advisor to USP II, supervising six CIE students.
- **Dr. Mahmoud Wazne** presented the following seminars: 1) Hazardous Waste Definition and Regulations- Resource Conservation and Recovery Act (RCRA). November 28, 2013. Lebanese University, Hadath Campus; and 2) Mitigation of chromite ore processing residue (COPR) hazards- Environmental forensics and remediation case study, November 28, 2013. Lebanese University, Hadath Campus.
- **Dr. Mazen Tabbara** participated in the ASEE Mechanics Virtual Community of Practice. Coordinator, Strategic Plan/Education Pillar/ GOAL: "Strengthen action learning and experiential learning in all programs, and grant students credit for such learning when applicable".
- **Dr. Mahmoud Wazne** participating in the development of an online Pro-Green certificate program with other universities through a project run by AUB and funded by the EU. Serving as a co-advisor for the following three Ph.D. students:
    - Rawaa Ammar (Platform for Research and Analysis in Environmental Sciences, Doctoral School of Science and Technology, Faculty of Sciences, Lebanese University, P.O Box 5, Campus Rafic Hariri, Hadath-Beirut, Lebanon). Main Advisor: Dr. Veronique Kazpard.
    - Nathalie Sleiman (Platform for Research and Analysis in Environmental Sciences, Doctoral School of Science and Technology, Faculty of Sciences, Lebanese University, P.O Box 5, Campus Rafic Hariri, Hadath-Beirut, Lebanon). Main Advisor: Dr. Veronique Kazpard.
    - Nadira Najib (Stevens Institute of Technology, Hoboken, New Jersey, USA). Main Advisor: Christos Christodoulatos.

3.6.3 Academic research activities

- **Dr. Mazen Tabbara** had a sabbatical leave during Spring 2013 at AUB.
- **Dr. Rita Awwad** has a funded proposal over $10K: U.S. Fulbright Visiting Scholar Program: funded proposal for a research project in collaboration with Purdue University for a three months period, July to September 2014. She also attended Anylogic software workshop in San Jose California, September 21-25, 2013.
- **Dr. Jean Chatila** has attended several workshops in the fields of water resources, GIS, and environmental engineering in Lebanon.
- **Dr. John Khoury** attended the following professional development activities:
  - A new generation of urban bus system: the answer to present & future mobility challenges in cities" – funded by UITP (EU) , *February, 2014*
  - Transportation Safety Management – Process Approach, *August, 2013* (CH2M HILL)
- As part of their final year project FYP (CIE 601 – Project I), teams were formed and final projects were submitted and presented during the year 2013-2014. Students who completed their FYPs are as follows:

Project	Student name	Area
CIE 601 Project 1 (FYP) – Groups for fall 2013		
Design of a sewer network and a wastewater treatment plant	Salim Khattar	Environmental
	Ramz Atallah	Water resources
	George Abi Saad	Water resources
	Habib Mansour	Water resources
Design of a bridge	Vernon Nassar	Transportation
	Ralph Hejeily	Geotechnical
	Sharbel Al Bayeh	Structural
	Anthony El Khoury Hanna	Construction
Design of a sewer network and a wastewater treatment plant	Izak Said	Water resources
	Hayfaa Assaad	Environmental
	Reham El Irani	Construction
	Samer Slika	Structural
	Tarek Semaan	Water resources
Design of a bridge	Ziad Mourad	Geotechnical
	Marc Maroun	Transportation
	Saad Breidy	Structural
	Rawan Bechara	Construction
Design of a sewer network and a wastewater treatment plant	Patrick El Murr	Water resources
	Jihad Milan	Environmental
Design of a residential building	Cynthia Souhaid	Construction
	Chadi Fawaz	Geotechnical
	Elie Mouarrek	Structural
Design of a residential building	Sarah Zgheib	Construction
	Johnny Zoghbi	Structural
	Helene Kassouf	Geotechnical
Design of a residential building	Mostapha Haidar	Structural
	Patrick Khairallah	Geotechnical
Design for rehabilitation of a	Habib Younes	Structural

Project	Student name	Area
CIE 601 Project 1 (FYP) – Groups for fall 2013		
montainous road segment	Michel Ghostine	Transportation
	Elias Salame	Geotechnical
Design of a service interchange	Mirla Abi Aad	Construction
	Hady El-Hachem	Structural
	Antonella Bared	Transportation
Design of a bridge	Stephanie Bassil	Structural
	Guilaine Ghossoub	Construction
	Roula El Hachem	Geotechnical
Design of a residential building	Tarek Farah	Geotechnical
	Rita Assaker	Structural
Design of a system interchange Area	Melanie Jabbour	Construction
	Omar El Souki	Transportation
	Mazen Haidar	Structural
CIE 601 Project 1 (FYP) – Groups for spring 2014		
Design of a Bridge	Chedid Mabel	Geotechnical
	El kalash Sana	Strucural
	Hajj Ali Taha	Construction
Design of a residential building	Outayek (El) Sarah	Geotechnical
	Saab Moustafa	Construction
	Harfouche Jennifer	Structural
Design of a Bridge	Al Halabi Imad	Structural
	Shahine Samer	Construction
	Said Moufid	Geotechnical
Design of a Bridge	Dawi Zein	Construction
	Helou Lili	Geotechnical
	Ali Hassan Ali	Structural
Design of a sewer network and a wastewater treatment plant	Chedid Fabienne	Environmental
	Slika Samer	Structural
	Haddad Jad	Water
Design of a sewer network and a wastewater treatment plant	Kaddah Ali	Structural
	Hajjar Rudy	Environmental
Design of a residential building	Alaydi Khaled	Geotechnical
	Abou Daher Aya	Construction
	Ajami Hassan	Structural
Design of a service interchange	Daher Hussein	Structural
	Hariz Sarah	Transportation
	Lara Shaya	Geotechnical
Design of a system interchange	El Solh Sima	Transportation
	Zaarour Robert	Structural
UNICEF "Sustainable Refugee camp"	Riachi Jamil	
	Saade Angela	
	Khaddaj Maggie	
	Salameh Sandra	
Design of a sewer network and a wastewater treatment plant	Abu Lteif Sultan	Water
	Fakih Hassan	environmental

3.6.4 Student activities

1) Sponsored field trips

The Department of Civil Engineering will organize three field trips annually in Lebanon, or lengthier trip outside the Lebanese borders, to senior students; where each trip will cost around $1,500. The field trips will include bus rental, lunch, full insurance coverage, and other related expenses. Destinations include construction and rehabilitation sites, dams and hydraulic structures, treatment plants, sites of specific geotechnical and environmental interest as well as renowned design offices.

2) CIE reunion weekend

On March 15th and 16th, 2014, 85 persons attended the reunion which included a seminar, a site visit to Chabrouh structure, exploration of Faqra ruins in addition to a one night accommodation hosted by the Aux Cimes du Mzart Resort, Kfardebian. During the seminar, Engineer Pierre Geara (Head of the 5th Branch in the order of engineers in Lebanon) described the different civil engineering fields available in Lebanon. They shared personal experience and advice and provided a detailed description of the 6 branches of the Order of Engineers in Lebanon.

Engineer Hiyami al Ra'i talked in depth about the Order of Engineers in Lebanon, its history, background, achievements; the importance of joining it; the procedure to do so, and the benefits of it.

3) ASCE annual gala dinner 2014

The Gala dinner included 95 attendees and aimed at gathering the family of civil engineers at LAU; faculty, students, and alumni. Faculty and students enjoyed the evening and the dinner.

4) ASCE Lebanon group – post-tensioning lecture

The lecture included 45 attendess. It was organized by ASCE Lebanon and the topic was on post-tensioning in buildings from Middle Eastern perspective. Mr. Guy Tabet, the CEO of CCL group of companies, gave the lecture. The lecture was followed by a discussion and a cocktail.

5) Technical trip to Beirut waterfront

On May 6th, 2014, a group of 30 civil engineering students paid a visit to the Waterfront City in Beirut. The visit aimed at introducing the new foundation techniques that are being used for the first time in Lebanon. Students attended a 50 min presentation by the project's contractors and then visited the site.

6) ASCE Lebanon student chapters reunion

The event, attended by 30 people on May 18th 2014 at El Rancho Ghodras, was organized in collaboration with ASCE student chapters at AUB, NDU, UOB, and USJ. It aimed at bringing civil engineer students from different universities together to compete, have fun, and get to

know each other. The event included lunch and a horse parade in addition to competitions such as building highest tower, Rodeo competition, and entrance-photo shoot competition.

3.6.5 Departmental activities

Civil Engineering department meets regularly and at least once a month to discuss different topics including research, student requests, surveys results, budget planning, graduate student recruitment, new courses, faculty recruitment, lab operation, awards, and other issues and requests for the dean for approval, in a way to develop the department. In addition, Chairperson is always available for student requests and advices.

Each member of the faculty being an advisor holds a number of students where he/she takes responsibilities among these students, from the day they enroll in the university till their graduation day.

3.6.6 Awards and Recognition

3.6.6.1 SOE dean best achievement awards

The Department of Civil Engineering shall select three eligible students from the Department of Civil Engineering who have completed between 100 and 120 credits (excluding freshman), to receive the SOE Dean Best Achievement Awards. These three students have the highest CGPAs in this category and will receive respectively $500; $300; and $200.

1)	Ms. Mirla Jean Abi Aad	Best achievement award	($500)
2)	Ms. Mabel Antoine Chedid	Second best achievement award	($300)
3)	Ms. Angela Charbel Saade	Third best achievement award	($200)

3.6.6.2 Hasan Abdallah Yabroudi CIE design project awards (renamed)

The Department of Civil Engineering shall select three individual students or student teams from the Department of Civil Engineering completing their Final Year Projects to win the Hasan Abdallah Yabroudi CIE Design project Awards. These awards are distributed on an annual basis to three deserving senior projects as follows: The three individual students or student teams with the Best Projects will receive respectively $1,000; $600; and $400.

1)	Rami Fouad El Azar	Best FYP award	($1,000)
2)	Patrick Pierre Chehwan	Second best FYP award	($500)
3)	Sarah Khaled Hijazi	Second best FYP award	($500)

3.6.6.3 CIE Chair term paper awards on current issues (newly introduced)

The Department of Civil Engineering shall organize a yearly term paper competition among the students in the Department at all levels. The term paper shall have no more than three pages of A4 size (new times roman 12). The topic for the first year will be: 'How can a civil engineer contribute to the economic development in the Middle East region'. The topic will be selected yearly based on recent developments and contemporary issues. The best three term papers selected by the Judging committee will receive the CIE Chair Term Paper

Awards on Current Issues. These three students will receive respectively $500; $300; and $200.

3.6.6.4 Yabroudi-Syracuse Graduate Fellowship

The Department of Civil Engineering at Syracuse University offers opportunities to 2 CIE-LAU Graduates to pursue graduate studies at the Masters or Ph.D levels with coverage of expenses through an endowment fund. Mr. Omar El-Masri was selected for a Ph.D. program for the AY 2014-2015.

3.7 Laboratories, Facilities and Amenities

3.7.1 General

The Department of Civil Engineering is committed to providing hands-on measurement and experimentation as a vital component of the educational program. Our labs provide undergraduate students with state-of-the-art equipment for experimentation and demonstration of the basic concepts covered in class. The laboratories are also used as testing facilities and for technical consultation by several engineering doc firms and private entities following internationally accepted standards and testing procedures.

3.7.2 Laboratories and centers

Facilities, which are used mainly for instructional purposes, house state-of-the-art equipment for experimentation and demonstration of the basic concepts covered in class. Also, the laboratories serve the faculty research activities. Furthermore, the CIE Laboratories play a leading role in serving as testing facilities for several engineering firms and private entities following the internationally accepted standards and testing procedures. Most of the testing equipment of the Department is housed in one large hall in the basement of the SB with a total area of 212 m^2. All the labs are operated and supervised by one Lead Lab Technician and one Lab Supervisor. Besides, funds have always been secured by the University to maintain, upgrade and/or purchase new equipment for these laboratories. Major Purchases include the following: a new state of the art 6 DOF Hexapod Shaking Table for earthquake simulations in addition to two fully automated Direct Shear machines and an UNSAT Triaxial sytem for the Soil Mechanics Laboratory. Furthermore, calibration has been conducted on our two material testing machines, Forney and Tinius Olsen. The Civil lab covers the sub-specialties mentioned below:

3.7.3 Construction materials lab

In this lab most standard tests can be performed on almost all construction materials, including concrete, aggregates, asphalt, various metals, and related constituents. It is equipped with a 400-ton Forney Hydraulic Testing Rig, a high-precision displacement controlled Instron Testing Frame, Tinius Olsen model H300KU Universal testing machine, equipment for standard testing of aggregates and concrete in both fresh and hardened stages, and equipment for non-destructive testing of different elements of existing structures, such as ultrasonic device, Schmidt Hammer, Windsor Probe, Rebar Scan, and Core Drills.

3.7.4 Environmental and water quality lab

This lab has a full range of standard equipment for performing routine environmental analyses of unit processes and operations in water and wastewater treatment, water quality parameters, investigations in fresh and marine water quality, solid waste characterization and properties, evaluation of treatment processes, digestion and co-digestion, reactor performance, solid waste management, environmental impact monitoring, and environmental site investigations. It is equipped with sampling devices and quality analysis of water/wastewater, jar tests, stream gauging, top of the line point and depth sediment samplers, bed load samplers, fluorometers, UV-visible spectrophotometers, colorimeters, peristaltic pumps, gas meters, centrifuges, incubators, and furnaces, in addition to mobile environmental monitoring stations for air pollution field measurements.

3.7.5 GPS/GIS and surveying Lab

This lab is equipped with mobile stations and the only continuous monitoring GPS station in Lebanon (LAUG), which is part of the UNAVCO consortium in the United States, and the International GPS Service. By conducting numerous field exercises using the tools at hand in this lab, students grasp the basic principles of surveying. Students gather field data, and then carry out the reduction and calculation of the data in the lab room. Other activities carried out in this lab include: collecting and modifying topographic maps, preparing digitized and GIS referenced maps with related features, DGPS measurements, presenting a general overview of geography, population, climate, water resources, water flows, dams, wastewater, water withdrawals, irrigation and drainage, on maps, survey and collect various data, and analyzing that data.

3.7.6 Soil and Geotechnical Lab

In this facility, students can perform standard laboratory and field identification tests of soils and their properties in the disturbed and undisturbed forms. The lab is equipped with automated direct shear boxes, triaxial cells, permeability cells, Atterberg test set, sand cone apparatus, standard and modified proctor hammers, horizontal sample ejector, soil sampling kit and a full SHARP asphalt concrete testing laboratory, in addition to a reflected-light high precision microscope facility.

3.7.7 Water Resources lab

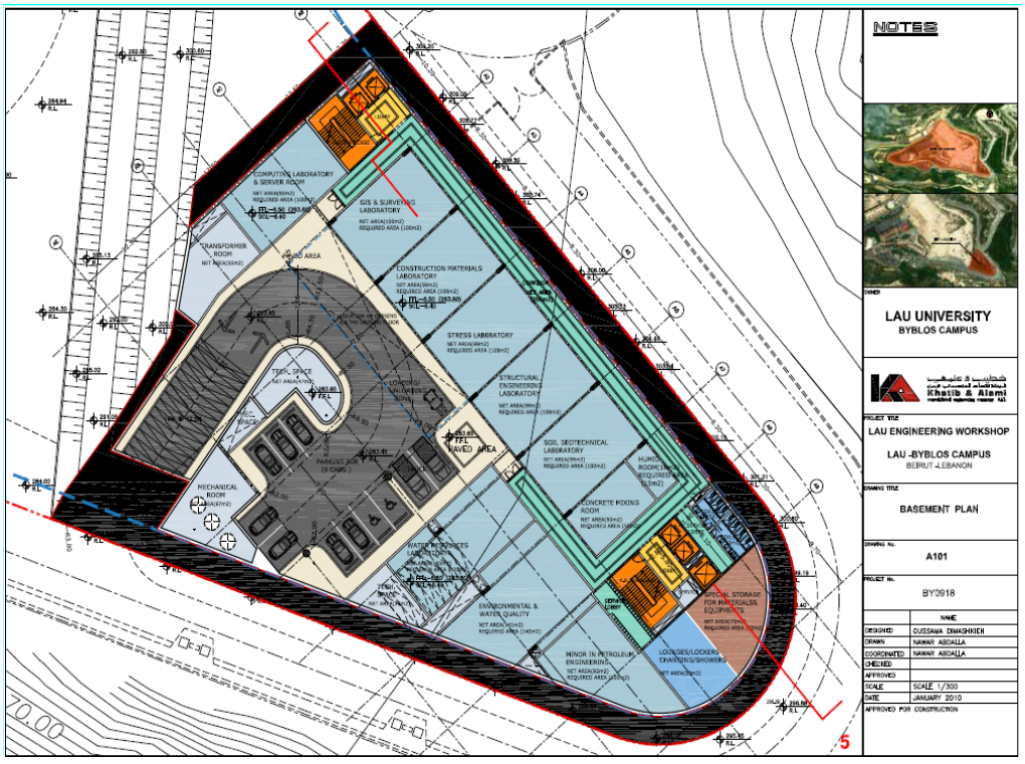
This lab features modern instruments and apparatuses for testing various fluids. Tests may be performed to measure fluid properties and behavior, flow measurements, piping systems, pumps and their characteristics, flow conditions, open channels, turbines, suspended sediments and bed load analysis, river flows and characteristics, flow measuring devices calibration and standardization, fluid friction, calibration of weirs, orifices, hydraulic jumps, forces on gates, hydraulic benches, flow regimes identification, flow velocities, dispersion studies, water depths and discharges; build the corresponding hydrographs; and offer technical consultations on hydraulic, and hydrologic, flow problems. This lab houses a five meter-long open channel with proper controls and mechanisms. It also includes Particle Image velocimetry equipment that allows students to visualize fluid structures.

3.7.8 Computer laboratory

The Architecture computer laboratory is used for delivering the Engineering Graphics course. The Civil Engineering Computer Laboratory located in room 702 of ZEH is used for delivering the CIE soft courses. The laboratory is used by students when classes are not scheduled. Also, students have access to the Industrial Engineering (INE) and Computer Engineering (COE) computer laboratories.

3.7.9 Prospective laboratory space

Recently, the Department prepared a comprehensive proposal included in the SoE plan for laboratory space. The University has approved the proposal to provide the SoE with a dedicated laboratory building to house all the labs for the three existing engineering departments. An engineering firm, Consolidated Engineering Company-Khatib and Alami, has graciously accepted to perform the architectural and engineering design of the building as a donation. The design drawings are underway and a committee has been established of members from the facilities department and representatives from SoE to coordinate the efforts for this new building. Faculty were consulted for their input. Implementation of this building plan is expected to be on time due to the commitment of the university to this project. The Byblos Campus Master Plan had the recommendation that the project completion date is January 2013. The Department has the approved space as shown in the figure 1 and table below.



Space Type	Areas (m^2)
Construction Materials, Structural Engineering, Stress Laboratory	325
Soil and Geotechnical Laboratory	100
Water Resources Laboratory	120
Environmental and Water Quality	140
GIS, Surveying, and Transportation Laboratory	100
Computing Laboratory + server room	100
Graduate Office Space	40
Technicians Office Space	40
Concrete Mixing Room	50
Humid Room	15
Storage space	70
Minor in Petroleum Engineering	100
Total Space	***1200***

In addition, and as a temporary solution to the lack of lab space, the university agreed to construct a flex space of 150 m^2 to be distributed equally among the CIE Department, IME Department and the Packaging Lab. This flex space was put in use in October 2010.

3.8 Equipment

3.8.1 Automated triaxial testing system

An Automated Triaxial Testing System was acquired through ASHA grant for about $108,000. This Automated Triaxial Testing System is a state of the art Triaxial machine specifically designed for the soils testing laboratories for conducting CU/CD Triaxial, unconfined, unsaturated tests, bender elements, and local strain measurement. The microprocessor system incorporates a large graphics display and a touch sensitive membrane key pad for data entry along with built-in multi-channel standalone data logger allows data acquisition from load, strain, pore pressure and volume transducers. This would definitely facilitate the introduction of experiments that would demonstrate to our students the in depth and detailed testing of soil samples.

The new triaxial machine is used in CIE 445 Soil Mechanics Laboratory for testing soils under different test conditions: consolidated-drained, consolidated undrained, unconsolidated-undrained tests in addition to doing bender element testing and testing under unsaturated conditions. Given the current enrollment numbers it is expected that around a 100 students will use it in CIE 445 course.

Dr. Grace Abou Jaoude (Assistant Professor of Civil Engineering) and Mr. George Chaccour (Civil Engineering Lab Supervisor) were involved in training sessions for the Triaxial System for 3 consecutive days on Wednesday 19th, Thursday 20th and Friday 21st of February 2014 from around 9 am till 5 pm at VJ Tech training center, UK.

3.8.2 Shaking table

A shaking able was acquired through ASHA grant for about $12,0000. The shaking table with its six degrees of freedom allows for the capabilities to simulate seismic excitations with real

life simulation type of approach on scale structures. This would definitely facilitate the introduction of experiments that would demonstrate to our students the response of structures to earthquake events. The shaking table is used for some experiments and research projects as shown below.

3.8.3 Universal Test Machine – 600 kN

A new floor standing machine Universal Testing Machine (UTM) has been ordered with several different controllers and test software options that make it possible to perform a wide range of tensile, compression, shear, flexure, peel, adhesion, friction, tear, cyclic, and flexural bend tests. The machine feature dual column frames with load ratings up to 600 KN and speeds up to 1000 mm/min (40 ipm). Computerized or standalone controllers are selected to match expectations for test setup, data capture, monitoring, analysis and test reporting. Accessories such as grips, fixtures, chambers and high travel extensometers are matched to your test and sample geometries. The load frame features robust high quality dual column ball screws selected for full scale loading. This Machine is expected to be received some time in the summer 2014.

3.9 Legislation and Curricular Changes

A restructuring of the CIE undergraduate curriculum was adopted, following an evaluation of the program. The changes were introduced to better meet the objectives and satisfy the outcomes of the program, while remaining in line with ABET criteria.

3.10 Future Plans

3.10.1 DCC-SU-LAU internship

The concerned parties have mutually agreed to resume the James A. Mandel & Samuel P. Clemence DCC – Syracuse University – LAU Internship Program (hereinafter referred to as "DSLIP") commencing in the summer of the 2013-2014 academic year. Students will receive a US $ 500 (US Dollars Five Hundred Only) notional stipend to provide them with spending money while in Dubai. DCC will provide the economy air fare tickets to and from USA/Lebanon as well as housing and daily lunches for the students. DCC will be responsible for the cost of only one faculty member's travel and lodging expenses from SU or LAU, who will support DCC in the conduct of the internship and act as the internship supervisor. The trip to the Middle East and time in Dubai of the student-interns is a remarkable opportunity to be exposed to different cultures and a diverse set of people.

4 ELECTRICAL AND COMPUTER ENGINEERING DEPARTMENT

4.1 Overview

The Department of Electrical and Computer Engineering has undergone a significant transformation over the past few years, and it stays in a state of continuous improvement.

We are reshaping our curricula to strengthen students' professional skills and academic knowledge. At the same time, we are recruiting new faculty meticulously, to increase our highly-qualified faculty body and further enhance our programs at both the graduate and undergraduate levels.

Our graduate students and faculty researchers have proven the importance of their work by publishing their findings in prestigious international journals.

The lab equipment used for our lab-based courses are also updated regularly to keep up with the needs of our students. The ECE department recently acquired an **Advanced Robotic Arm System**.

4.1.1 Insights

- As part of the continuous effort to stay in compliance with the quality standards established by ABET, the Electrical and Computer Engineering programs have been under constant review through the continuation of the assessment process that was launched by the School of Engineering.
- The design component in our Capstone Design Projects has been strengthened and it is the focal point of the projects submitted this year.
- The M.S in Engineering program continues to bear its fruit by graduating 3 M.S. students. It is important to highlight in this regard that recent articles were written based on the submitted theses and that these articles ended up being published in reputed journals and conferences.

4.2 Personnel

4.2.1 Full-time faculty

Dr. Chadi Abou Rjeily, Associate Professor
Ph.D. 2006, Ecole Nationale Supérieure des Télécommunications, France
DEA 2003, Ecole Nationale Supérieure des Télécommunications, France
B.E. 2002, Lebanese University, Lebanon
Senior member IEEE

Dr. Wissam Fawaz, Associate Professor
Ph.D. 2006, University Paris 13, France
DEA 2002, Université Paris VI, France
B.E. 2001, Lebanese University, Lebanon
Member of IEEE

Dr. Raymond Ghajar, Professor
Ph.D. 1993, University of Saskatchewan, Canada
M.S. 1987, University of Saskatchewan, Canada
B.S. 1983, University of Ottawa, Canada
Senior member of IEEE
Member of WEC, Order of Engineers of Tripoli

Dr. Zahi Nakad, Associate Professor and Chairman
Ph.D. 2003, Virginia Tech, USA
M.S. 2000, Virginia Tech, USA
B.E. 1998, American University of Beirut, Lebanon
Member of IEEE

Dr. Georges Nasr, Professor and Dean
Ph.D. 1988, University of Kentucky, USA
M.S. 1985, University of Kentucky, USA
B.S. 1983, University of Kentucky, USA
Senior member of IEEE

Dr. Iyad Ouaiss, Associate Professor
Ph.D. 2002, University of Cincinnati, USA
B.S. 1994, University of Cincinnati, USA

Dr. Samer Saab, Professor and Associate Dean
Ph.D. 1992, University of Pittsburgh, USA
M.A. 1990, University of Pittsburgh, USA
M.S. 1989, University of Pittsburgh, USA
B.S. 1988, University of Pittsburgh, USA
Senior member of IEEE

Dr. Dani Tannir, Assistant Professor
Ph.D. 2010, McGill University, Canada
M.E. 2006, McGill University, Canada
B.E. 2004, American University of Beirut, Lebanon
Member of OIQ and IEEE

Dr. Joe Tekli, Assistant Professor
Ph.D. 2009, University of Bourgogne, LE2I UMR-CNRS, France
M.S. 2006, University of Bourgogne, LE2I UMR-CNRS, France
M.E. 2005, Antonine University, Lebanon
Member of IEEE

4.2.2 Part-time faculty

Dr. Tony Azar, Assistant Professor

Dr. Bachir Habib, Assistant Professor

Dr. Randa Zakhour, Assistant Professor

Dr. Georges Sakr, Assistant Professor

Dr. Walid Ghandour, Assistant Professor

Dr. Abbas Tarhini, Assistant Professor

Ms. Rana Zeitouni, Instructor

4.2.3 Non-teaching staff

Ms. Andrea Jamhour
ECE Administrative Assistant

Mr. Charbel Kadi
Computer Lab Supervisor

Mr. Toni Mezher
Senior Lab Technician

4.3 Students

The following tables summarize the number of students (new, enrolled and graduates) in the ECE department per campus over the past three years.

4.3.1 Byblos campus

Academic Year 2011-2012	Fall 2011			Spring 2012			Summer I 2012			Summer II 2012		
	Enrolled	New	Graduates	Enrolled	New	Graduates	Enrolled	New	Graduates	Enrolled	New	Graduates
BE-CMPENG	103	16		98	2	9	46					
BE-ELCENG	63	10	2	62	1	5	26					
MSE-COMPE	10	3	1	11	2	1						
Total	**176**	**29**	**3**	**171**	**5**	**15**	**72**	**0**	**0**	**58**	**0**	**0**
Academic Year 2012-2013	**Fall 2012**			**Spring 2013**			**Summer I 2013**			**Summer II 2013**		
	Enrolled	New	Graduates	Enrolled	New	Graduates	Enrolled	New	Graduates	Enrolled	New	Graduates
BE-CMPENG	126	27	8	115	4	14	53		2	37		
BE-ELCENG	84	20		81	4	9	31		1	30		
MSE-COMPE	8	2	1	12		2				2		1
Total	**218**	**49**	**9**	**208**	**8**	**25**	**84**	**0**	**3**	**69**	**0**	**1**
Academic Year 2013-2014	**Fall 2013**			**Spring 2014**			**Summer I 2014**			**Summer II 2014**		
	Enrolled	New	Graduates	Enrolled	New	Graduates	Enrolled	New	Graduates	Enrolled	New	Graduates
BE-CMPENG	132	22	3	123	1							
BE-ELCENG	91	15	5	81	1							
MSE-COMPE	10	3	1	6								
Total	**233**	**40**	**9**	**210**	**2**							

4.3.2 Beirut campus

Academic Year 2011-2012	Fall 2011			Spring 2012			Summer I 2012			Summer II 2012		
	Enrolled	New	Graduates	Enrolled	New	Graduates	Enrolled	New	Graduates	Enrolled	New	Graduates
BE-CMPENG	31	25		31	1		16			6		
BE-ELCENG	13	9		17	1		9			5		
MSE-COMPE												

Total	**44**	**34**		**48**	**2**		**25**	**0**		**11**	**0**	
Academic Year 2012-2013	**Fall 2012**			**Spring 2013**			**Summer I 2013**			**Summer II 2013**		
	Enrolled	**New**	**Graduates**	**Enrolled**	**New**	**Graduates**	**Enrolled**	**New**	**Graduates**	**Enrolled**	**New**	**Graduates**
BE-CMPENG	23	16		17			10			8		
BE-ELCENG	11	9		12	1		5			2		
MSE-COMPE												
Total	**34**	**25**		**29**	**1**		**15**	**0**		**10**	**0**	
Academic Year 2013-2014	**Fall 2013**			**Spring 2014**			**Summer I 2014**			**Summer II 2014**		
	Enrolled	**New**	**Graduates**	**Enrolled**	**New**	**Graduates**	**Enrolled**	**New**	**Graduates**	**Enrolled**	**New**	**Graduates**
BE-CMPENG	15	12		18	1							
BE-ELCENG	7	6		6								
MSE-COMPE												
Total	**22**	**18**		**24**	**1**							

4.3.3 Total University

Academic Year 2011-2012	**Fall 2011**			**Spring 2012**			**Summer I 2012**			**Summer II 2012**		
	Enrolled	**New**	**Graduates**	**Enrolled**	**New**	**Graduates**	**Enrolled**	**New**	**Graduates**	**Enrolled**	**New**	**Graduates**
BE-CMPENG	134	41		129	3	9	62			45		
BE-ELCENG	76	19	2	79	2	5	35			24		
MSE-COMPE	10	3	1	11	2	1						
Total	**230**	**63**	**3**	**219**	**7**	**15**	**97**	**0**	**0**	**69**	**0**	**0**
Academic Year 2012-2013	**Fall 2012**			**Spring 2013**			**Summer I 2013**			**Summer II 2013**		
	Enrolled	**New**	**Graduates**	**Enrolled**	**New**	**Graduates**	**Enrolled**	**New**	**Graduates**	**Enrolled**	**New**	**Graduates**
BE-CMPENG	149	43	8	132	4	14	63		2	45		
BE-ELCENG	95	29		93	5	9	36		1	32		
MSE-COMPE	8	2	1	12		2				2		1
Total	**252**	**74**	**9**	**237**	**9**	**25**	**99**	**0**	**3**	**79**	**0**	**1**

Academic Year 2013-2014	Fall 2013			Spring 2014			Summer I 2014			Summer II 2014		
	Enrolled	**New**	**Graduates**	**Enrolled**	**New**	**Graduates**	**Enrolled**	**New**	**Graduates**	**Enrolled**	**New**	**Graduates**
BE-CMPENG	147	34	3	141	2							
BE-ELCENG	98	21	5	87	1							
MSE-COMPE	10	3	1	6								
Total	**255**	**58**	**9**	**234**	**3**							

4.4 Research

4.4.1 Journal publications

1. **Chadi Abou-Rjeily**, "Performance Analysis of Selective Relaying in Cooperative Free-Space Optical Systems", IEEE/OSA journal of lightwave technology, vol. 31, no. 18, pp. 2965 - 2973, September 2013.
2. **Chadi Abou-Rjeily**, "Achievable Diversity Orders of Decode-and-Forward Cooperative Protocols over Gamma-Gamma Fading FSO Links", IEEE transactions on communications, vol. 61, no. 9, pp. 3919 - 3930, September 2013.
3. **W. Fawaz**, "Improved EDF-based Management of the Setup of Connections in Opaque and Transparent Optical Networks", Springer Journal of Photonic, Network Communications, vol. 27, issue 1, pp. 8 – 15, January 2014.
4. **W. Fawaz**, R. Atallah, and M. Khabbaz, "A First Step Towards the Resolution of the Starvation Problem in Multi-Point-to-Point ICRCNs", IEEE Communications Letters, vol. 17, issue 11, pp. 2104 – 2107, November 2013.
5. Tokhtarian and **Saab**, "Impact of Model-Order Reduction of a DC Motor on Control Systems: An Undergraduate Laboratory Module," International Journal of Engineering Education.

4.4.2 Conference publications

1. **Chadi Abou-Rjeily**, "Simple-DF versus Selective-DF Relaying over Rayleigh Turbulence-Induced FSO Fading Channels", in the proceedings of the 24th Annual IEEE International Symposium on Personal, Indoor and Radio Communications (PIMRC-13), pp. 1082-1086, 2013.
2. R. Chedid, A. Salloum, M. Ziade**, R. Ghajar** and H. Hamdan, "A Techno-Economic Appraisal of Clean Coal-Fired Power Plants for Lebanon", 8th Conference on Sustainable Development of Energy, Water and Environment Systems (SDEWES 2013), Dubrovnik, Croatia, September 22 – 27, 2013, pp. 0296: 1 – 13.
3. R. Chedid, R. Tajeddine, R. Awwad, F. Chaaban, and **R. Ghajar**, "A Comparative Analysis of Various Equivalent Circuits for Performance Evaluation of PV Cells", 8th Conference on Sustainable Development of Energy, Water and Environment Systems (SDEWES 2013), Conference Proceedings, Dubrovnik, Croatia, September 22 – 27, 2013, pp. 0352: 1 – 11.
4. **R. Ghajar** and R. Chedid, "Integration of Renewable Energy Technologies in the Lebanese Electric Power System", The Inaugural European Conference on Sustainability, Energy and the Environment (ECSEE 2013), Conference Proceedings, Brighton, UK, July 4 – 7, 2013, pp. 172 – 181.
5. **Joe Tekli**, Antoine Bou Rjeily, Richard Chbeir, Gilbert Tekli, Pélagie Houngue, Kokou Yetongnon, Minale Ashagrie, Semantic to Intelligent Web Era Building Blocks, Applications, and Current Trends, International ACM Conference on Management of Emerging Digital Eco-Systems (ACM MEDES'13), October 2013, Luxembourg.
6. Bernard Semaan, **Joe Tekli**, Youssef Bou Issa, Richard Chbeir, Gilbert Tekli, Toward Enhancing Web Accessibility for Blind Users through the Semantic Web, International Conference on Signal Image Technology & Internet Systems (IEEE/ACM SITIS'13), November 2013, Kyoto, Japan

7. Amine Awada, Youssef Bou Issa, **Joe Tekli**, Richard Chbeir, Evaluation of Touch Screen Vibration Accessibility for Blind Users, ACM SIGACCESS International Conference on Computers and Accessibility (ACM ASSETS'13), October 2013, Bellevue, Washington, US

4.5 Course Offering

The following tables summarize the course offering during the academic year 2013-2014 per full-time faculty and semester. Some statistics are provided about the number of sections offered and the number of students per section (in brackets).

Instructor's Name	Courses Taught		
	Fall 2013	**Spring 2014**	**Summer 2014**
Chadi Abou Rjeily	**ELE 537** Communications Systems (51) **ELE 531/731** Optical Fiber Comm. (17)	**ELE 430** Signals and Systems (61) **ELE 535/537** Inf. and Coding Theory (25)	
Wissam Fawaz	**COE 212** Eng'g Prog (38) **COE 312** Data Structures (45) **COE 593** COE Application (26)	**COE 212** Eng'g Prog (78) **COE 431** Comp Networks (30)	
Raymond Ghajar	**INE 320** Eng'g Economy I (36) **ELE/COE 493** Prof in Eng'g (26) **ELE 422** Power Systems (13)	**ELE 420** Electromechanics (16)	
Zahi Nakad	**COE 414** Oper Systems (24) **COE 521/721** Embd Sys (18)	**COE 323** Microprocessors (58)	
George Nasr	**ELE 391** Mathematical Methods in Electrical Engineering (29)		
Iyad Ouaiss	**COE 423** Computer Architecture (26) **COE 321** Logic Design (69)	**COE 424** Digital Systems (25) **COE 522/723** High Perf. Comp. Arch. (27)	(planned) **COE 498** Profl Exp **ELE 498** Prof Exp
Samer Saab	**ELE 442** Control Systems (39) **ELE/COE 493** Prof in Eng'g (26)		
Dani Tannir	**ELE 302** Electrical Circuits II (62) **ELE 501** Microelectronics (28)	**ELE 201** Elect Circuits I (20) **ELE 401** Electronics I (58)	
Joe Tekli	**COE 212** Eng'g Prog (80) **COE 599B/799B** Int. Data Process. & App. (16)	**COE 212** Eng'g Prog (41) **COE 416** Software Eng'g (17) **COE 599C/799C** Intel. Eng'g Algorithms (28)	

Computer Engineering			Electrical Engineering		
Course #	**Course Title**	**# Sections**	**Course #**	**Course Title**	**# Sections**
Fall 2013					
COE 201	Computer Proficiency	8	ELE 302	Electrical Circuits II	2
COE 212	Engineering Prog	6	ELE 303	Electrical Circuits Lab	3
COE 312	Data Structures	1	ELE 305	Intro to Elect. Eng'g.	1
COE 321	Logic Design	2	ELE 391	Math. Met in Elect. Eng'g	1
COE 322	Logic Design Lab	5	ELE 413	Electromagnetic Waves	1
COE 324	Microprocessors Lab	3	ELE 422	Power Systems	1
COE 414	Operating Systems	1	ELE 442	Control Systems	1
COE 416	Software Engineering	1	ELE 443	Control Systems Lab	3
COE 418	Database Systems	2	ELE 493	Prof in Engineering	1
COE 423	Computer Arch	1	ELE 501	Microelectronics	1
COE 493	Prof in Engineering	1	ELE 531	Optical Fiber Comm	1
COE 521	Embedded Systems	1	ELE 537	Communication Systems	2
COE 591	Capstone Design Proj		ELE 591	Capstone Design Project	
COE 593	COE Application	1	ELE 731	Optical Fiber Comm	1
COE 599B	Int. Data Proc & App	1			
COE 721	Embedded Systems	1			
COE 728	ULSI Testing	1			
COE 799B	Int. Data Proc & App.	1			
COE 899	Comp. Eng'g Thesis				
Spring 2014					
COE 201	Computer Proficiency	5	ELE 201	Electrical Circuits I	3
COE 212	Engineering Prog	4	ELE 305	IntrO to Electrical Eng'g.	1
COE 323	Microprocessors	2	ELE 401	Electronics I	2
COE 416	Software Engineering	1	ELE 402	Electronics I Lab	4
COE 424	Digital Systems	1	ELE 411	Electromagnetic Fields	1
COE 425	Digital Systems Lab	2	ELE 420	Electromechanics	1
COE 431	Computer Networks	1	ELE 423	Electric Machines Lab	1
COE 492	Fundamentals in ECE	1	ELE 430	Signals and Systems	2
COE 522	High Perf Comp. Arch	1	ELE 492	Fundamentals in ECE	1
COE 591	Capstone Design Proj		ELE 526	Renew Energy Sources	1
COE 599C	Intel. Eng. Algorithms	1	ELE 528	Electrification of Plants	1
COE 723	High Perf. Comp. Arch	1	ELE 535	Infor and Coding Theory	1
COE 799C	Intel. Eng. Algorithms	1	ELE 538	Noise in Comm Systems	1
COE 899	Comp. Eng'g Thesis		ELE 539	Telecomm Systems	1
			ELE 540	Comm Systems Lab	2
			ELE 591	Capstone Design Project	
			ELE 593	ELE Application	1
			ELE 735	Infor. and Coding Theory	1
Summer I 2014					
COE 591	Capstone Design Proj		ELE 305	Intro to Electrical Eng'g	1
Summer II 2014 (Planned)					
COE 498	Prof Experience		ELE 498	Professional Experience	
COE 591	Capstone Design Proj		ELE 591	Capstone Design Project	

4.6 Assessment

The ECE department conducted assessment of all student outcomes (a) to (k) in 2013 – 2014 as shown in the table below. The details of the assessment results are contained in the COE and ELE assessment reports.

For this academic year, the soft skills were assessed by a panel of faculty members who asked students registered in the Professional course selected questions about each soft skill and filled a corresponding rubric. The ECE faculty also found that the assessment results taken in the ECE Fundamentals course were not satisfactory and decided to delete the course and change the assessment station and methodology.

Student outcome	Assessment Station	Results
a, e	ECE Fundamentals	Not satisfactory
b, k	Electronics Lab	Satisfactory
c, g	Capstone design project	Satisfactory
d, f, h, i, j	Faculty panel	Satisfactory

4.7 Activities

4.7.1 Professional activities and services

Dr. Chadi Abou Rjeily

- Associate editor IEEE Transactions on Communications.
- Chaired the session "Signal Processing for Wireless Communications II" in the conference IEEE PIMRC-13.
- TPC member for the IEEE GLOBECOM-2013
- Technical reviewer for the following international journals: IEEE Journal on Selected Areas in Communications; IEEE Transactions on Communications; IEEE Communications Letters; and IEEE Wireless Communications Letters.

Dr. Wissam Fawaz

- Associate Editor IEEE Communication Letters
- TPC (Technical Program Committee) for:
  - IEEE Global Communications Conference (Globecom), 2014
  - IEEE Wireless Communications & Networking Conference (WCNC), 2014
  - IFIP Network of the Future (NoF), 2014
  - IEEE International Conference on Connected Vehicles and Expo (ICCVE), 2014
- Reviewer for the following international journals and conferences: IEEE Transactions on Communications; IEEE WCNC 2014; and IEEE ICCVE 2013.

Dr. Raymond Ghajar

- Senior Energy Advisor, Minister of Energy and Water (Feb. 2008 – Present)
- Lead Consultant, Arab Supply and Trading Company (ASTRA) (Summer 2013)
- Reviewer of several journals in the fields, renewable energy, utility policy, economic modeling of energy projects.

Dr. Zahi Nakad

- Reviewer for IEEE ISWC and TIE

Dr. Iyad Ouaiss

- Reviewer for several professional journals and conferences in the CAD and Reconfigurable Computing fields.

Dr. Samer Saab

- Reviewer for the following international journals: IEEE Transactions on Automatic Control; IEEE Transactions on Industrial Electronics; and International Journal of Control.

Dr. Dani Tannir

- Completed a course on "Professionalism in Engineering" at the Ordre des Ingenieurs du Quebec (OIQ), May 2013.
- Reviewer of technical papers for NEWCAS 2013 (IEEE conference).

Dr. Joe Tekli

- Publicity chair for IEEE Services Congress including: ICWS; CLOUD, SCC, MS, Big Data
- TPC (Technical Program Committee) for:
  - IEEE International Conference on Web Services IEEE ICWS
  - IEEE International Conference on Cloud Computing IEEE CLOUD
  - International Conference on Cloud Computing CLOSER
  - IARIA International Conference on Digital Society IARIA ICDS
  - ACM Conference on Emergent Digital EcoSystems ACM MEDES
  - International Conference on Signal Image Technology & Internet based Systems
- Reviewer for:
  - Springer Multimedia Tools and Applications
  - Super Computing
  - International Journal of Information Technology and Web Engineering
  - Canadian Center of Science and Education: Network and Communication Technologies CCSE NCT
  - IEEE International Conference on Web Services
  - International Conference on CLOUD Computing
  - IARIA International Conference on Digital Society
  - ACM Conference on Emergent Digital EcoSystems

4.7.2 Academic research activities

The following is a list of Capstone design projects in the ECE department:

1. Hussein Rachini and Raffoul Francis, "VVChat", Dr. Wissam Fawaz, **fall 2013**.
2. Georges Mantoufeh, "Best Buy Radar Application", Dr. Wissam Fawaz, **fall 2013**.
3. Farouk Ghizzawi and Mohamad Khawly, "Smart E-bike", Dr. Dani Tannir, **fall 2013**.
4. Firas Jaber, "Universal Alarm Security System", Dr. Dani Tannir, **fall 2013**.
5. Ahmad Maarawi and Hani Eid, "Home Automation and Electricity Management System (HAEMS)", Dr. Zahi Nakad, **spring 2014**.

6. Jihad Dib and Jimmy Ghosn, "Remote Controlled Automated Delivery System", Dr. Zahi Nakad, s**pring 2014**.
7. Sabine Oussi, "Sign Language Recognition and interpretation system", Dr. Iyad Ouaiss, **spring 2014**.
8. Nicolas El Khoury and Georges El Rahi, "Home Security System", Dr. Iyad Ouaiss, **spring 2014**.
9. Sana ElHakim and Anthony Francis, "Smart Android Download Scheduler", Dr. Wissam Fawaz, **spring 2014**.
10. Ramzi Njeim, "Tag My World", Dr. Wissam Fawaz, **spring 2014**.
11. Hanady Najm and Lina Fattah , "Automated Room Control System", Dr. Dani Tannir, **spring 2014**.
12. Adnan Hamdan and Hussein Mroweh, "Smart Metering", Dr. Dani Tannir, **spring 2014**.
13. Hasan Yassine, "2-Axis Solar Tracking", Dr. Dani Tannir, **spring 2014**.
14. Amine Razzouk and Maria Raad, "Surveillance Boat", Dr. Dani Tannir, **spring 2014**.
15. Jad Said, "Obstacle Avoidance Cane for Blind People Assistance", Dr. Dani Tannir, **spring 2014**.

The following is a list of Master's thesis projects in the ECE department:

1. Hamze Msheik, "An RFID Localization Methodology using a Single Stationary Antenna", Dr. Samer Saab, **fall 2013**.
2. Joe Khalife, "Designing Policies using a MIMO PID Controller for Correlated Multiple-Policy Multiple-Objective Strategic Planning: A Balanced Scorecard Approach", Dr. Samer Saab, **spring 2014**.
3. Ahmad Al-Kawam, "KT2C: K-way Thermal Chip Clustering", Dr. Iyad Ouaiss, **spring 2014**.

5 INDUSTRIAL AND MECHANICAL ENGINEERING DEPARTMENT

5.1 Personnel

5.1.1 Full-time faculty

Dr. Michel KHOURY, Associate Professor and Chair
Lehigh University, 2004
Research Interest: Aerodynamics, Fluid Mechanics, and Turbulence modeling.

Dr. Barbar AKLE, Assistant Professor and Assistant Dean
Virginia Tech, Virginia, 2005
Research Interest: Mechatronics, Instrumentation, Robotics, Smart Materials and Structures, and Solid Mechanics and Controls.

Dr. Pierrette ZOUEIN, Associate Professor
University of Michigan, Ann Arbor, 1996
Research Interest: Facilities Planning and Logistics.

Dr. Elie BADR, Professor
Tulsa University, Oklahoma, 1997
Research Interest: Stress Concentration in Pressurized Crossbores.

Dr. Abdallah SFEIR, Emeritus Professor
University of California, Berkeley, USA
Dr. Wassim HABCHI, Assistant Professor
Institut National des Sciences Appliquées de Lyon, 2008
Research Interest: Tribology, Contact Mechanics, Finite Elements, Multiphysical modeling.

Dr. Jimmy ISSA, Assistant Professor
Michigan State University, 2008
Research Interest: Vibration Suppression using Passive and Active Techniques.

Dr. Ramy HARIK, Assistant Professor
Henri Pointcaré University, Nancy, 2007
Research Interest: Computer Aided Engineering (CAD/CAM), Manufacturing, Process Planning.

Dr. Jean Paul ARNAOUT, Associate Professor
Old-Dominion University, 2005
Research Interest: Optimization Techniques, Modeling and Simulation, Scheduling and Rescheduling.

Dr. Charbel MANSOUR, Assistant Professor
Mines ParisTech, 2009
Research Interest: Modeling of electrified powertrains, Energy Management

Dr. Marc HADDAD, Assistant Professor
Massachusetts Institute of Technology (MIT), Cambridge, Massachusetts, 2008
Research Interest: Systems Engineering

Dr. Ihab ALI, Assistant Professor
University of Maryland, 2010
Research Interest: Renewable Energy, Multi-Phase Heat Transfer.

5.1.2 Adjunct faculty

Dr. Walid Abillama
University of Michigan, Ann Arbor, USA, 1994
Research Interest: Production and Yield Management.

5.1.3 Part-time faculty

Dr. Ali H. Ammouri
Mechanical Engineering, American University of Beirut, 2013
Research Interest: Manufacturing, friction stir processing

Dr. Nabil Nehme
Civil Engineering, American University of Beirut, 2012
Research Interest: Large Scale Optimization, Linear/Non-Linear Integer Programming, Dynamic Programming, Game Theory.

Dr. Mira Thoumy
Operations Management – sector: healthcare, HEC Montreal, 2013
Research Interest: quality, performance, and continuous improvement in the health care field

Dr. Alain Makhoul
Mechanical Engineering, American University of Beirut, 2013
Research Interest: Fluid Mechanics, Heating Ventilation and Air-Conditioning

Dr. Roy Awedikian
Industrial Engineering, Ecole Centrale Paris, 2009
Research Interest: Design Engineering, Software Engineering, Verification and Validation

Mr. Antoine Skayem
MS – Industrial Engineering and Engineering Management, LAU
Teaching Control Lab, Computer Applications in IME

Mr. Michel Nacouzi
MS – Industrial Engineering and Engineering Management, LAU
Teaching Manufacturing and Computer Aided Design Labs

Mr. Suhail Shatila
MS – Industrial Engineering and Management, LAU
Teaching Engineering Graphics

MS. Micheline Dib
MS – Science in Mathematics, University of Texas at Arlington, 2002
Teaching Optimization, advanced statistics

Mr. Antoine Semaan
MS – Industrial Engineering, Purdue University, 1988
Teaching Project Contracting

Ms. Lara El Amm
MS– Civil and Environmental Engineering, MIT, 2003
Teaching Engineering Economy

Ms. Namitta Merchak
BE – Architecture
Teaching Engineering Graphics lab

Mr. Elias Mouarbes
BA–Industrial Graphic Design
American University of Culture and Education
Teaching Manufacturing Lab

5.1.4 Non-teaching staff

Ms. Joyce Feghaly Abi Raad
Lebanese American University, 2003
Master of Business Administration

Ms. Nicole Wehbe
American University of Beirut, 1998
Masters in Engineering Management

Mr. Salim Jamaleddine
Lebanese American University, 2010
Bachelor in Computer Engineering

5.2 Students

The following tables summarize the number of new and total students in the IME department per campus over the past three years.

Undergraduate Industrial Engineering								
Campus	Fall 2011		Fall 2012		Fall 2013		Spring 2014	
	New	Total	New	Total	New	Total	New	Total
Byblos	12	76	11	77	19	89	0	86
Beirut	3	4	1	2	6	7	0	6
Total	**15**	**80**	**12**	**79**	**25**	**96**	**0**	**92**

Undergraduate Mechanical Engineering								
Campus	Fall 2011		Fall 2012		Fall 2013		Spring 2014	
	New	Total	New	Total	New	Total	New	Total
Byblos	37	225	47	277	55	309	5	295
Beirut	41	50	32	40	28	34	2	30
Total	**78**	**275**	**79**	**317**	**83**	**343**	**7**	**325**

Graduate Industrial Engineering				
Campus	Fall 2011	Fall 2012	Fall 2013	Spring 2014

	New	Total	New	Total	New	Total	New	Total
Byblos	1	5	4	6	4	10	0	10
Beirut	0	0	0	0	0	0	0	0
Total	**1**	**5**	**4**	**6**	**4**	**10**	**0**	**10**

In July 2014, **14 students** received their BE in Industrial Engineering – one with Distinction and four with Honors, **57 students** received their BE in Mechanical Engineering – three with High Distinction, two with Distinction and one with Honors and **3 students** received their MS in Industrial Engineering and Engineering management.

5.3 Research

5.3.1 Journal publications

1. Khoury John, **Akle J. Barbar**, Katicha Samer, Ghaddar Ahmad, Daou Makram, "A microscale evaluation of pavement roughness effects for asset management", International Journal of Pavement Engineering, (2013). Published online: DOI: 10.1080/10298436.2013.792930.
2. Kocer Bilge; Zangrilli Ursula; **Akle Barbar**; Weiland Lisa, "Experimental and Theoretical Investigation of Ionic Polymer Transducers in Shear Sensing", Accepted in the Journal of Intelligent Material Systems and Structures.
3. R. F. Harik and **J. S. Issa** – *"Design of a vibration absorber for harmonically forced damped systems" Journal of Vibration and Control (Available Online - In Press), 2013.*
4. M. Björling, **W. Habchi**, S. Bair, R. Larsson and P. Marklund - Towards the True Prediction of EHL Friction, Tribology International, 2013, vol. 66, pp. 19-26.
5. **W. Habchi** - Reduced Order Finite Element Model for Elastohydrodynamic Lubrication: Circular Contacts, Tribology International, 2014, vol. 71, pp. 98-108.
6. M. Björling, **W. Habchi**, S. Bair, R. Larsson and P. Marklund – Friction Reduction in Elastohydrodynamic Contacts by Thin Layer Thermal Insulation, Tribology Letters, 2014, vol. 53, pp. 477-486. Featured in the January 16th 2014, vol. 505, "Research Highlights Section" of Nature: «Warm Carbon Coat Reduces Friction» (http://www.nature.com/nature/journal/v505/n7483/full/505264b.html).
7. **W. Habchi** - A Numerical Model for the Solution of Thermal Elastohydrodynamic Lubrication in Coated Circular Contacts, Tribology International, 2014, vol. 73, pp. 57-68.

5.3.2 Conference publications

1. **Akle J. Barbar**, and Habchi Wassim, "*Finite Element Modeling of the Sensing and Energy Harvesting Performance in Ionic Polymer Metal Composites*", Proceedings of the SPIE 19th Annual Symposium on Smart Structures and Materials, San Diego, California, Volume 833, 2013.

2. **Akle J. Barbar**, Habchi Wassim, "*Finite Element Analysis of the Sensing Behavior in Ionic Polymer Metal Composites: Introduction of the Streaming Potential",* Proceedings of the 6th ECCOMAS Conference on Smart Structures and Materials, SMART2013, Politecnico di Torino, Italy, June 2013.

3. **Mansour C.**, *"*Optimized Rule-Based Energy Management Strategy for the Toyota Prius Plug-In Hybrid using Dynamic Programming*". FISITA 2014, 34th World Automotive Congress, Maastricht, The Netherlands.*

4. B. Akle and **W. Habchi** – Finite Element Analysis of the Sensing Behavior in Ionic Polymer Metal Composites: *Introduction of the Streaming Potential, 6th ECCOMAS Conference on Smart Structures and Materials, SMART 2013, Torino, Italy.*

5. **W. Habchi** – Reduced Finite Element Elastohydrodynamic Lubrication Model: Circular Contacts, *40th Leeds-Lyon Symposium on Tribology & Tribochemistry Forum 2013, Lyon, France.*

6. B. Akle and **W. Habchi** – Finite Element Modelling of the Sensing and Energy Harvesting Behaviour in Ionic Polymer Metal Composites, *SPIE Smart Structures NDE 2013, San Diego, USA.*

7. **W. Habchi**, S. Bair and P. Vergne – Quantification of Friction Regimes in Elastohydrodynamic Lubrication, *5th World Tribology Congress (WTC 2013), 2013, Torino, Italy.*

8. **R. Harik–** Recognition of Thin Features Using Heat Diffusion, *10th Iinternational Symposium on Tools and Methods of Competitive Engineering (TMCE) 2014, Budapest, Hungary, May 19-23, 2014.*

5.3.3 International collaborations

Dr. Wassim Habchi
Research collaboration and work on different joint projects involving collaborations with renowned international researchers from different institutions:

Project 1: Towards the True Prediction of EHL Friction. Collaborators are:
- M. Björling (Lulea University, Sweden)
- R. Larsson (Lulea University, Sweden)
- P. Marklund (Lulea University, Sweden)
- S. Bair (Georgia Tech, USA)

Project 2: On the Mechanism of Friction Reduction in DLC Coated EHD Contacts. Collaborators are:
- M. Björling (Lulea University, Sweden)
- R. Larsson (Lulea University, Sweden)
- P. Marklund (Lulea University, Sweden)
- S. Bair (Georgia Tech, USA)

Dr. Michel Khoury
Research collaboration has been established with Kanazawa University.

Project 1: Optimization of Variable-Pitch-angle Wind Turbines. Collaborators are:
- T. Kiwata (Kanazawa University, Japan)

5.3.4 Donors/sponsors

For AY 2013-2014, the following donors/sponsors contributed to IME activities:

Donor/Sponsor	Project type/ Activities	Amount in (USD)
Shell iStyle	Shell-Eco Marathon	$5,000
Byblos Bank	Shell-Eco Marathon	$3,000
DHL	Shell-Eco Marathon	50% reduction on Shipment cost (July 2013 and Jan. 2014)
Badawi Group	IIE and ASME clubs	$3,000

5.4 Course Offering

The following tables list all the IME courses that were offered during AY 2013 – 2014. The tables show the number of credits, sections and students for each listed course.

Undergraduate Industrial Engineering					
Term	**Course Nb.**	**Course Name**	**# of credits**	**# of Sections**	**#of students**
Fal 13	INE307	Deterministic OR Models	3	1	16
	INE320	Engineering Economy I	3	1	36
	INE402	Optimization	3	1	33
	INE416	Ergonomics	4	1	31
	INE417	Ergonomics Lab	1	2	32
	INE428	Project Management	3	1	39
	INE440	Advanced Statistics	3	1	34
	INE442	Quality Control I	3	1	17
	INE446	Production Systems II	3	1	16
	INE506	Decision Analysis	3	1	19
	INE527	Project Scheduling	3	1	16
	INE563	CAD/CAM	3	1	18
	INE591	Project I	3	1	9
	INE593	Capstone Engineering Design	1	1	14
	INE599A	Lean Manufacturing	3	1	14
	INE599D	Intro to System Dynamics	3	1	29
	INE599E	Intro to System Analysis	3	1	10
Spr 14	INE308	Stochastic OR Models	3	1	24
	INE320	Engineering Economy I	3	3	95
	INE346	Production Systems I	3	1	13
	INE350	Simulation	3	1	21
	INE351	Simulation Lab	1	2	21
	INE362	Manufacturing Processes	3	3	21
	INE363	Manufacturing Lab	1	4	19
	INE402	Optimization	3	1	44
	INE407	Network Flow	3	1	20
	INE428	Project Management	3	2	64
	INE438	Facilities Planning and Layout	3	1	16
	INE491	Seminar on contemp. issues	3	1	12
	INE498	Professional experience T	6	1	1

Undergraduate Industrial Engineering					
Term	**Course Nb.**	**Course Name**	**# of credits**	**# of Sections**	**#of students**
	INE529	Project Contracting	3	1	38
	INE548	Machine Scheduling	3	1	25
	INE591	Project I	3	1	9
	INE593	Capstone Engineering Design	1	1	9
	INE599F	Case studies in engineering design	3	1	26
Sum I 14	INE320	Engineering Economy I	3	1	39
	INE402	Optimization	3	1	9
Sum II 14	INE320	Engineering Economy I	3	2	79
	INE498	Professional Experience	6	1	11

Undergraduate Mechanical Engineering					
Term	Course Nb.	Course Name	# of credits	# of Sections	#of students
Fal 13	MEE211	Engineering Graphics	1	9	165
	MEE212	Computer Applications in IME	2	2	81
	MEE212	Computer Apps in IME - Lab	0	4	81
	MEE241	Dynamics	3	1	31
	MEE301	Engineering Thermodynamics	3	2	84
	MEE311	Fluid Mechanics	3	2	71
	MEE312	Fluid Mechanics Lab	1	4	71
	MEE321	Material Properties and Processes	3	3	126
	MEE351	Computer Aided Design	3	2	84
	MEE351	Computer Aided Design – Lab	1	4	84
	MEE407	Internal Combustion Engines	3	1	28
	MEE407	Internal Combustion Engines Lab	1	1	8
	MEE414	Thermal Systems Design	3	2	73
	MEE422	Mechanical Engineering Design	3	1	40
	MEE442	Mechanical Vibrations	3	2	60
	MEE443	Mechanical Vibrations Lab	1	3	57
	MEE445	Control Systems	3	2	60
	MEE446	Control Systems Lab	1	3	48
	MEE515	Refrigeration and Air Conditioning	3	2	71
	MEE516	Refrigeration and Air Condit Lab	1	3	74
	MEE533	Advanced CAD/CAM	3	1	3
	MEE591	Project I	3	1	38
	MEE592	Project II	3	1	1
	MEE593	Capstone Engineering Design	1	1	12
	MEE599B	Lean Manufacturing	3	1	20
	MEE599D	Intro to Sustainable Energy	3	1	35
	MEE599E	Advanced Power Trains	3	1	32
	MEE599H	Passive Building Design	3	1	30
Spr 14	MEE211	Engineering Graphics	1	6	113
	MEE212	Computer Applications in IME	2	1	22
	MEE212	Computer Appss in IME - Lab	0	1	22
	MEE241	Dynamics	3	2	74
	MEE302	Energy Conversion	3	2	53

Undergraduate Mechanical Engineering					
Term	Course Nb.	Course Name	# of credits	# of Sections	#of students
	MEE311	Fluid Mechanics	3	1	32
	MEE312	Fluid Mechanics - Lab	1	2	23
	MEE320	Strength of Materials	3	2	86
	MEE332	Manufacturing Processes	3	3	85
	MEE333	Manufacturing Lab	1	5	77
	MEE341	Kinematics & Dynamics of Linkages	3	2	81
	MEE351	Computer Aided Design	3	1	25
	MEE351	Computer Aided Design - Lab	0	1	25
	MEE391	Instrumentation & Measurements	3	2	88
	MEE390	Instr. and Measurements – Lab	0	5	88
	MEE401	Energy Systems	2	1	15
	MEE403	Heat Transfer	3	2	72
	MEE404	Heat Transfer Lab	1	4	68
	MEE421	Finite Element Methods	3	1	20
	MEE422	Mechanical Engineering Design	3	1	45
	MEE491	Seminar in Contemp. Issues	3	1	30
	MEE591	Project I	3	1	23
	MEE593	Capstone Engineering Design	1	1	16
	MEE599E	Advanced Power Trains	3	1	31
	MEE599F	Composite Materials	3	1	26
	MEE599I	Sustainable Architecture	3	1	40
	MEE599J	Energy Audit	3	1	40
	MEE599K	Non Linear Dynamics and Chaos	3	1	20
Sum I 14	MEE212	Computer Applications in IME	2	1	14
	MEE212	Computer Apps in IME - Lab	0	1	14
	MEE341	Kinematics & Dynamics of Linkages	3	1	24
	MEE498	Professional Experience	6	1	18
Sum II 14	MEE498	Professional Experience	6	3	27

Graduate Industrial Engineering					
Term	Course Nb.	Course Name	# of credits	# of Sections	#of students
Fal 13	INE700	Advanced Statistics	3	1	5
	INE706	Decision Analysis	3	1	5
	INE742	Industrial Quality Control	3	1	1
	INE840B	Lean Manufacturing	3	1	6
	INE840E	Intro to System Dynamics	3	1	5
Spr 14	INE707	Network Flow	3	1	7
	INE800	Project Course	3	1	1

5.4.1 New courses offered during AY 2013 – 2014

1. **Non Linear Dynamics and Chaos –** Introduction to nonlinear dynamics, with applications to physics, engineering, biology, and chemistry. Emphasizes analytical methods, concrete examples, and geometric thinking. Topics include one-dimensional systems;

bifurcations; phase plane; nonlinear oscillators; and Lorenz equations, chaos, strange attractors, fractals, iterated mappings, period doubling.

2. **Energy Audit** – This course covers the survey of energy sources, cost analysis, alternatives, environmental issue, audit techniques, and technical reporting.

3. **Sustainable Architecture** – This course covers issues surrounding the integration of energy-sustainable and passive design principles into conceptual and practical building designs.

4. **Case Studies in engineering design** – Practical industrial case studies in automotive and energy industries: optimization of an engineering process within a multidisciplinary automotive organization, improvement of an engineering organization within a multidisciplinary and multicultural power plant project. Each case study will recall some of the design engineering fundamentals (modeling, simulation, decision analysis, quality management, project organization, etc.).

5.4.2 Summer internship

A number of companies were contacted to provide summer internship for our students. The following table presents a list of the companies that offered professional training to IME students.

Company	Major
Air Liquide	Industrial
Aramex	Industrial
Consolidated Contracting Co. CCC	Industrial
Dar Al Handasah (Shair & Partners)	Industrial
Expeditors International	Industrial
Liban Cables	Industrial
Masco, MEA	Industrial
National Oilwell Varco	Industrial
Petform	Industrial
Sanita s.a.l	Industrial
Saudi Building Systems Manufacturing Co.	Industrial
Saudi Pump Factory	Industrial
Sodamco s.a.l	Industrial
Abniah s.a.r.l. Engineering & Contracting	Mechanical
Ahmed Ramadan Juma Sons. Co.	Mechanical
Al Jaber & Partners	Mechanical
Beirut International Marine Industry and Commerce s.a.r.l	Mechanical
BUMC (Boustany United Machineries Co.) sal	Mechanical
Consolidated Contractors Company-CCC	Mechanical
Contracting and Trading Company-CAT	Mechanical
Dar Al Handasah (Shair & Partners)	Mechanical
Debbas Enterprize s.a.l.	Mechanical
E.M. Project	Mechanical

Company	Major
Equip Engineering & Contracting	Mechanical
General Electric	Mechanical
Gulf Industrial Services Company (GISCO) L.L.C	Mechanical
Kettaneh Construction sal	Mechanical
Khatib & Alami	Mechanical
Kia Motors Armenia	Mechanical
LG Electronics	Mechanical
M. Ezzat Jallad & Fils	Mechanical
ME Groupe	Mechanical
Middle East Airlines / MASCO	Mechanical
Mrad Enterprises SARL	Mechanical
Petrofac International LTD	Mechanical
Phoenix Machinery	Mechanical
Rafik El Khoury & Partners	Mechanical
Sabeco & Partners	Mechanical
Sanita s.a.l	Mechanical
Solidere	Mechanical
Sport Motors Group	Mechanical
T. Gargour & fils s.a.l.	Mechanical
Tariq Al Ghanim General Trading and Contracting Co. W.L.L	Mechanical
Technica Intl	Mechanical
TETCO	Mechanical
Unic	Mechanical
UNIPAK Tissue Mill	Mechanical
Zuhair Fayez Partnership Consultants	Mechanical

5.5 Activities

5.5.1 Professional activities and services

Dr. Barbar Akle

- Conference Co-Chair of the SPIE's EAPAD 2014 Conference.
- Member of the Organizing Committee of the 14th Conference on Electroactive Polymer Actuators and Devices (EAPAD).
- Participated in the Technical committee for smart materials and structures meetings for 2013. Participated in judging the Best Student Paper, and head of Communication and social media Subcommittee.
- Chaired several sessions in the SPIE 2013 conference.
- Serving as an Associate Editor for the Journal of Intelligent Material Systems and Structures.
- Reviewed several papers submitted to the Journal of Smart Materials and Structures, International Journal of Applied Mechanics, and Journal of Intelligent Material Systems and Structures. Reviewer for CNRS.
- SoE LIRA coordinator.

Dr. Jean-Paul Arnaout

- Served as a member on the 8th International Workshop on Enterprise & Organizational Modeling and Simulation (EOMAS) conference program committee.

Dr. Jimmy Issa

- Participated in the ASME weekend which was held in November 2013.

Dr. Wassim Habchi

- Member of the scientific committee of the 19th Lebanese Association for the Advancement of Science (LAAS) conference organized in LAU, Beirut Campus.
- Member of the Editorial Board of the 9th International Conference on Engineering Computational Technology (ECT 2014), Naples, Italy.
- Jury Member for the Best Poster Award at the 40th Leeds-Lyon Symposium on Tribology.
- Member of the development committee for the PRO-GREEN joint/dual graduate diploma and professional degree in green technologies (TEMPUS Project).
- Technical reviewer for the following international journals: Tribology International; Tribology Transactions; *ASME Journal Of Tribology; Lebanese Science Journal;*

Dr. Michel Khoury

- Reviewed manuscripts for the Renewable & Sustainable Energy Reviews Elsevier journal.
- Chaired a session on Energy-Savings and Renewable Energy at FLUCOME 2013.
- Participated in the Engineering Projects Day.

Dr. Marc Haddad

- Enrolled as Transport consultant with the UNDP CEDRO project, to prepare two papers (exchange) on the Lebanese transport sector: "Sustainable road transportation in Lebanon", and "Sustainable Aviation: Case of Middle East Airlines".
- Served as Juror for the MIT Arab Business Plan Competition (http://mitarabcompetition.com/)

Dr. Charbel Mansour

- Enrolled as Transport consultant with the UNDP CEDRO project, to prepare two papers (exchange) on the Lebanese transport sector: "Sustainable road transportation in Lebanon", and "Sustainable Aviation: Case of Middle East Airlines".
- Transport consultant with UNDP, Energy and Environment program, Climate Change team, and the Ministry of Environment (MOE), for the design and preparation of Nationally Appropriate Mitigation Actions (NAMA) for Lebanon. Participation in consultation meetings at the MOE, focus groups and presentation of the work in the NAMA design and preparation workshop for Lebanon, May 22, 3013.
- Participation in the Shell Eco-Marathon competition in Manila Philippines, February 2014. Participation in the Helix Tribology Award as an off-road competition.
- Served on the LAU SOE focus group for the Holcim Award (Fall 2013).

Dr. Ihab Ali

- Served (for four consecutive years) as member of the world-Wide Technical Committee for SEMI-THERM, "Semiconductor Thermal Measurement, Modeling and Management Conference".

Dr. Pierrette Zouein

- Consulting for UNDP CEDRO Project on Sustainable aviation in Lebanon.

- Consultant on the PNU project, coordinator for 2 tasks.
- Reviewer for the following Journals: Automation in Construction, Elsevier
- Member of ASCE TCCIT Intelligent Computing (IC) Committee

5.5.2 Outreach activities

Dr. Barbar Akle

- Chair of the Arts and Science Fair at LAU. Introduced several new competitions in Engineering and Sciences area.
- Organized Two NI seminars one for the electrical engineering students and another for the MEE students on November 5.

Dr. Wassim Habchi

- Shell-Eco-Marathon (SEM) 2013 – Kuala Lumpur, Malaysia:
  - Coordinator and co-advisor for the FYP Shell-Eco-Marathon, in which an electric car was designed and built to participate in SEM 2013, in Kuala Lumpur, Malaysia and SEM 2014, in Manila, Philippines.
  - Raised Funds: $8,000
- Annual IME Faculty vs Students Basketball Exhibition Game
  - Organizer of the Annual IME Faculty vs Students Basketball Exhibition Game
- First Lego League (FLL)
  - Head of Jury and Jury member of the "Mission" section Jury
- Jounieh International Festival Green Day
  - Shell-Eco Marathon Poster presentation at Jounieh International Festival Green Day

Dr. Michel Khoury

- Participated in the pro-green program

5.5.3 Academic research activities

A total of 12 FYPs were completed and presented by IME students during AY 2013 – 2014. A brief description of these projects is provided below.

4. Dr. Pierrette Zouein and Dr. Marc Haddad, "Re-designing processes of the emergency department at UMC Rizk Hospital", (3 INE students/3 teams)

   Project Description

   The purpose of this project is to redesign processes of the emergency department at UMC Rizk hospital. The final design should automate the processes as much as possible and minimize the time spent by the patient in the system. Students are asked to:

   - model the existing process using analytical tools or simulation
   - investigate ways to automate the process and minimize waste and paperwork by applying Lean concepts
   - provide a new design for rendering the services in the emergency room that optimizes the hospital effectiveness and patient satisfaction

   Project Deliverables

- Model of existing operations (analytical or simulation model)
- Survey of best practices and new technology available for streamlining the processing of patients in the emergency department
- Investigation of system design solutions and justification for the proposed design
- A report emphasizing the proposed design's economic and sustainability aspects and highlighting the risks associated with its implementation

5. Dr. Pierrette Zouein and Dr. Marc Haddad, "Re-designing patient admission processes at UMC Rizk Hospital", (7 INE students/2 teams)

   Project Description

   The purpose of this project is to redesign patients' admission processes at UMC Rizk hospital. The final design should automate the process as much as possible and minimize the time spent by the patient in the system to move to his/her hospital bed. Students are asked to

   - model the existing process using analytical tools or simulation
   - investigate ways to automate the process and minimize waste and paperwork by applying lean concepts
   - provide a system design that optimizes

   Project Deliverables

   - Model of existing operations (analytical or simulation model)
   - Survey of best practices and new technology available for streamlining the process of patient admission
   - Investigated system design solutions and justification for the proposed one
   - A report) should emphasize the economical, and sustainability aspects and highlight the risks associated with implementation of the proposed design

6. Dr. Ramy Harik and Dr. Jimmy Issa, "Design of a Four Seater Carcycle", (4 MEE students/2 Teams)

   Project Description

   A four seater Car cycle is a human powered vehicle which can host up to four cyclists. The gearbox of this device is carefully designed such that the efforts of all four cyclists are separately added to propel the car forward. The car cycle should be equipped with a mechanical energy storage system which is used to store energy when it is moving down the hill. The stored energy will be used to help propel the vehicle forward when needed.

   Project Deliverables

   - A CAD drawing of the design
   - Simulation of the prototype
   - Design of the gearbox of the vehicle
   - Design of the mechanical energy storage system
   - Stress analysis using commercial finite element software
   - Actual vehicle to be tested on the road

7. Dr. Barbar Akle and Dr. Charbel Mansour, "Automated Device for Pothole Identification on various roadway classes in Lebanon", **(**3 MEE students/2 Teams)

   Project Description

The main outcome of this project is to design, implement and test a reliable device to automate data collection and mapping of pavement roughness on various functional classification roadways and to quantify fuel consumption for enhanced benefit-to-cost analysis, asset management, and infrastructure investment strategies.

In order to achieve the stated goals, the project is split into two main pillars. First, sensors will be deployed at several locations to measure the vehicles' vertical accelerations over various pavement sections. Fuel consumption will be correlated to the vehicle's vertical acceleration over those pavement conditions. The second pillar will focus on identifying rough pavement potholes and mapping them in real time using GIS/GPS compatible algorithm, a step towards a better asset management system.

Project Deliverables

- Allocate test sites where two roads exists with similar elevation and curvature while having different roughness (CIE)
- Design the best locations for the accelerometers based on car dynamics (MEE)
- Design and implement an instrumentation system composed of the accelerometers, GPS and data acquisition. (MEE)
- Assess the possibility of designing an ultrasonic road roughness sensor and acquiring data from car sensors (MEE/CIE)
- Test several vehicles with the proposed system and obtain a correlation between fuel consumption and road roughness as a function of vehicle speed and type (MEE/CIE)
- Design and test an algorithm to detect potholes and their severity from the vertical acceleration data (MEE/CIE)
- Implement an algorithm to use the previous algorithm and GPS data to create in real-time pothole GIS layer (CIE)
- Implement and test the system along with a GPS/GIS system (MEE)

Project Constraints

- Feasible
- Robust algorithm
- Robust instrumentation system

8. Dr. Wassim Habchi and Dr. Charbel Mansour, "Shell Eco Marathon", (4 MEE students/2 Teams)

Project Description

The project consists in designing and building a car intended to participate in the Shell Eco-Marathon 2013 held in Kuala Lumpur, Malaysia. The Shell Eco-Marathon is a car design competition that consists in designing a vehicle that travels the **farthest distance** using the **least amount of energy**. Two vehicle categories are considered: Prototype and Urban. Under each category, there are two engine classes: Electric Mobility (hydrogen battery or solar cells or plug-in electricity) and Internal Combustion (Gasoline or Diesel or Biofuels or Gas-To-Liquid fuel). Depending on the selected car type / category a set of design specs is specified by the Shell Eco-Marathon organizing committee: volume, height, width, weight, number of wheels, safety standards, etc. Students will have to participate in a fund raising campaign for the project in order to raise the necessary

funds for the car design and shipment to Kuala Lumpur and to cover their accommodation and participation to the event in Malaysia.

Project Deliverables

- Report including design parameters, aerodynamic study, FEM analysis, etc.
- Operational vehicle, designed according to the specs specified by the competition
- Poster to be presented at the competition

9. Dr. Michel Khoury and Dr. Barbar Akle, "Solar Aircraft", (4 MEE students/2 teams)

   Project Description

   Development of unmanned solar powered aircraft has attracted attention of several agencies over the past decade because of their promising potential in military and civilian applications. In Lebanon such aircraft could be used as communication links or sensors to monitor remote areas.

   The objective of this current research is to successfully design and build an unmanned solar powered aircraft that is able to fly continuously for several hours.

   The aerodynamics of the aircraft has to ensure maximum efficiency. The solar cells must be properly embedded in the aircraft. The structure has to be optimized along with the material selection to ensure minimal weight. Appropriate amount of batteries has to be optimized along with other needed electronic components

   Project Deliverables

   - Optimal Aerodynamic Design
   - Dynamics and stability of the Aircraft
   - Structural finite elements design
   - Reliably embed solar cells in the wings
   - Optimize of the amount of batteries
   - Build a WORKING prototype
   - Test the prototype to achieve more than 2 hours of continuous flight

10. Dr. Barbar Akle, "Autonomous Fire Fighting Robot for devastated areas", (4 MEE students)

    Project Description

    Intelligent robots provide an excellent solution for dangerous missions. Combating fires in devastated areas is a mission that threatens the life of firefighters. In this project we propose the development of an autonomous robot that maneuvers around a specified area to detect fires and extinguishes them. The terrain could be a refugee camp or a devastated building. The robot will be equipped with sufficient sensors, cameras, and telemetry devises that allow it to autonomously maneuvering a certain area with fire while being remotely monitored.

    Project Deliverables

    Design and Build a prototype robot that will:

    - Maneuver a relatively rough terrain

- Avoid obstacles
- Detects a fire and efficiently extinguish it
- Using Xbee protocols can provide telemetry data of: GPS location, Proximity sensors, IR camera, temperature, smoke, CO and CO2 levels

11. Dr. Barbar Akle and Dr. Zahi Nakad, "Autonomous Self-rechargeable Quad-copter", (2 MEE students)

    Project Description

    Quad-copters have been proven to be a stable, efficient, safe, and reliable means of small parcel transportation. However the range of transportation is short and limited by the battery weights. The purpose of this project is to design and test a fully autonomous Quad-copter that hovers over a long distance by self-recharging through landing on solar powered recharging stations.

    Project Deliverables

    - Auto-piloted Quad-copter from a pre-set point A to Point C landing and taking off from Point B, a recharge station
    - Self-Rechargeable Quad-copter
    - Design of the Recharge station

    Project Constraints

    - Feasible
    - Robust algorithm
    - Carry its own weight, plus the instrumentation and communication systems, plus a camera

12. Dr. Michel Khoury, "Design of a parabolic solar cooker", (3 MEE students / 2 Teams)

    Project Description

    Tens of thousands of Syrian people who were forced to abandon their homes and their country cannot rely on traditional means of cooking due to economic hardship. Solar cooking offers a practical, affordable and sustainable alternative solution that can be used in refugee camps to alleviate this adversity. In this project students will design a solar parabolic cooker and build a small prototype that should also be capable of heating water when needed. Students will perform thermal computations to determine the necessary reflective surface area. They will optimize the cost by selecting low-grade material (can lids etc.) and reduce manufacturing complexity.

    Project Deliverables

    Project should consist of the following:

    - selection of low-grade material/low cost
    - design a collector to focus the sun rays (on fluid/cooker)
    - build and characterize the performance of the system
    - ease of manufacturability/ mobility

13. Dr. Jimmy Issa, "Design for Vibration Suppression in Electric Generators", (4 MEE students/1 team)

Project Description

Electric generators are commonly used in Lebanon to overcome the shortage in the electric power provided by the government. These generators are prone to vibrations which might lead to mechanical failures and noise emission. The aim of this project is to design vibration suppression systems which might include a combination of vibration absorbers and vibration isolation systems to reduce and suppress this unwanted vibration. The design will include fatigue analysis of all proposed vibration suppression systems to ensure a prolonged life. The project will consider commonly used generators in Lebanon.

Project Deliverables

Project should consist of the following:

- Modeling of an electric generator with cabin
- Propose a combination of absorbers designs and vibration isolation systems
- Fatigue analysis of the final design

14. Dr. Jimmy Issa and Dr. Ramy Harik, "Smart Green House", (4 MEE students/2 teams)

Project Description

There is need to build homes that are energy efficient heavily relying on sustainable energy sources: renewable energy (Solar, Wind, Anaerobic, etc.) combined with energy efficient technologies. This project invites students to investigate renewable energy resources that can be exploited at a fixed geographic location in Lebanon (Jounieh). The landmark will be provided and should be studied for thermal/acoustic isolation, solar heaters, photovoltaic, windows angle control, wind driven power, waste management, night lights, pipe lighting and any other system they will propose. The energy management of the house should be connected to central control systems that optimize several parameters (window angles, photovoltaic angles, etc.).

Project Deliverables

Project deliverables consist of the following:

- Full thermal study of the landmark
- Heating Plumbing circulation maps (connected to Chimney as well as a back incinerator of disposable waste)
- Potential greenhouse effect study similar to Levinton project in Argentina http://www.treehugger.com/files/2008/06/low-cost-energy-efficient-homes-argentina.php
- Cost study and payback time to solutions with respect to local market costs (electricity, water)
- Detailed MEP of Landmark (including insulation layers)
- Labview application of the control system, sensor selection and quotes

Project Constraints

- The study should be conducted on a specified landmark location
- Study should account for cost of proposed solutions
- Study should include innovative solutions as well as their application

15. Dr. Charbel Mansour and Dr. Ihab Ali, "Design and Analysis of a Sustainable (Zero Net) Energy Building under Local Lebanese Solar and Wind Conditions", (4 MEE students/2 teams)

    Project Description

    Sustainable energy design of buildings has become a vital component of the overall architecture design due to many factors including environmental, economic, security and socio-ergonomic ones. The definition of a sustainable zero net energy building is such that the building must not and does not use more energy than it creates. This could be achieved by a systematic design and analysis of both the electrical energy consumed by a building and its occupants as well as the electricity produced by the building's sustainable energy production components. The project would analyze and design both aspects of the building and integrate them to achieve a zero net energy sustainable architecture.

    Project Deliverables

    Project deliverables consist of the following:

    - Analysis of electrical energy needs and energy efficiency levels of a model building
    - Selection of HVAC systems to minimize the energy consumption levels
    - Design a renewable (green) hybrid solar PV/wind sustainable energy system for the model building based on Lebanon solar and wind data
    - Calculation of the overall building carbon foot print and the total yearly reduction in equivalent CO_2 emission

5.5.4 Students' clubs activities

The ASME and IIE clubs organized a series of activities during AY 2013-2014. The common activities of both clubs for the past year are:

1. **ASME/IIE Professional Development weekend**

   The aim of the weekend was Professionalism and career guidance and certainly to welcome new students to the club.

   Venue: le Crillon hotel, Broumana
   Date: 5 and 6 October, 2014
   Participants: IME faculty and 90 ASME student members and Faculty
   Speakers: Mr. Christopher Littlefield, Dr. Marc Haddad and LAU Engineering Alumni

2. **ASME/IIE internship testimonials**

   This is a 2-day event in which seniors share their Professional training experience that every mechanical engineering student has to pass through during one academic summer. Thus, all attendees benefited from the experience of their older colleagues.

   For ASME, the testimonials hosted 8 students which got their training in various fields (oil and gas, contracting, manufacturing, design, maintenance and services).

3. **ASME/IEE Christmas dinner**

Venue: Marinus Byblos

The dinner was a get together and it gave the ASME/IIE members a chance to get to know each other as well as to get to know some of their faculty members.

4. **ASME MATELEC Fieldtrip**

A group of 20 ASME students took a tour in the MATELEC huge plant in Amchit, going thru the manufacturing chain from A to Z. Students got to see how big scale manufacturing is done and how such industries operate.

5. **ASME ALMAZA fieldtrip**

The field trip took place in the Almaza Factory in Dawra. ASME Members got to see the different stages of making and bottling beers, as well a small overview of the hygiene and safety measurements that are taken in such industries.

6. **ASME AUB SPDC competition**

This competition takes place each year in one university around Lebanon, LAU ASME members participated in only one completion (Rafic Hariri University design competition) and went home with the FIRST place.

7. **IIE Orientation Day for new students**

This event was held at the beginning of the 2013-2014 academic year in which Dr. M Haddad gave a presentation for the first year INE students.

5.5.5 Departmental activities

On May 16, 2014, the IME department organized the Engineering Projects Day where engineering students from the different engineering departments were given the opportunity to showcase the projects they have been working on the whole year.

Here below a list of the Industrial and Mechanical engineering projects exhibited during the 2014 EPD:

1. LAU Spider Robot Race
2. Design of a steering system for the LAU Shell Eco-Marathon race car
3. Design of the powertrain of the LAU Shell Eco-Marathon race car
4. Design of dyno-chassis test bench for the LAU Shell Eco-Marathon race car
5. Shell Eco-Marathon race car telemetry Box
6. Low Cost Automated Remote Child Health Monitoring Device: (UNICEF)
7. Low cost Incubator with Telemedicine (UNICEF)
8. Compact waste sorting machine with automated voucher generator (UNICEF)
9. High efficiency wood stove (UNICEF)
10. Smart CPR machine
11. Transportable Living Spaces for Homeless (UNICEF)
12. Low Cost Water Saving and Soap Dispenser Devise: (UNICEF)
13. Solar Cooker (UNICEF)
14. Lighter than air UAV (ASME Student Design competition)
15. Wind Tunnel Instrumentation

16. Automated paintball turret
17. Stair Climbing Robot
18. Solar powered Aircraft
19. Smart Green house
20. Firefighting robot (UNICEF)
21. Extended range quadcopter (UNICEF)

6 GNE COURSES

6.1 Overview

The General Engineering or GNE courses are administered by the office of the Dean to serve all Engineering Students.

6.2 Personnel

6.2.1 Full-time faculty

Mr. Samer Abi Ghanem, Instructor of Actuarial Sciences
M.A. in actuarial science, 2003, University of Texas at Austin, USA

Dr. Chadi Abou Rjeily, Associate Professor
Ph.D. 2006, Ecole Nationale Supérieure des Télécommunications, France

Dr. Nader El Khatib, Assistant Professor of Mathematics
Ph.D. in Applied Mathematics, 2009 Université de Lyon, France.

Dr. Chadi Nour, Associate Professor of Mathematics
Ph.D. in Pure Mathematics, 2003, University Claude Bernard Lyon1, France

Dr. Jean Takchi, Associate Professor of Mathematics
Ph.D. in Mathematics from the Pennsylvania State University in 1984

6.2.2 Part-time faculty

Mr. Fadi El Chiti, Instructor

Dr. Daoud Baalbaki, Assistant Professor

Dr. Patricia Maatouk, Assistant Professor

Ms. Samar Mansour, Instructor

Dr. Habib El Rai, Professor

Mr. Ziad Sankari, Instructor

Mr. Imad El Chiti, Instructor

Dr. Solange Aoude, Assistant Professor

Dr. Hiba Sukkarieh Nakkash, Assistant Professor

Dr. Hassan Saoud, Assistant Professor

Dr. Leila Issa, Assistant Professor of Mathematics
Ph.D. in Computational and Applied Mathematics (CAAM), Rice University, May 2010

Dr. Rony Touma, Associate Professor of Mathematics
Ph.D. in applied mathematics (numerical analysis), 2005, University of Montreal, Canada.

6.3 Course Offering

The school of Engineering offered a total of 28 (20 courses in fall 2013 – spring 2014 and 8 courses in summer 2014) in general engineering during the 2013 – 2014 academic year. The following tables summarize the course offering per faculty and semester. Some statistics are provided about the number of sections offered and the number of students per section (in brackets).

Instructor's Name	Courses Taught		
	Fall 2013	**Spring 2014**	**Summer 2014**
Habib Rai	**GNE 212** Engineering Mechanics (60)	**GNE 212** Engineering Mechanics (43)	**GNE 212** Engineering Mechanics (14)
Daoud Baalbaki	**GNE 212** Engineering Mechanics (23)		
Samar Mansour	**GNE 301** Professional Communication (26)		
Ziad Sankari	**GNE 301** Professional Communication(76)	**GNE 301** Professional Communication(60)	**GNE 301** Professional Communication(42)
Fadi El Chiti	**GNE 305** Professional Ethics (141)		
Imad El Chiti		**GNE 305** Professional Ethics (67)	**GNE 305** Professional Ethics (36)
Chadi Nour	**GNE 331** Probability & Statistics (44)	**GNE 331** Probability & Statistics (45)	**GNE 331** Probability & Statistics (42)
Patricia Maatouk	**GNE 331** Probability & Statistics (41)		
Nader El Khatib	**GNE 333** Engineering Analysis (19)	**GNE 333** Engineering Analysis (46)	
Samer Abi Ghanem		**GNE 331** Probability & Statistics (23)	**GNE 331** Probability & Statistics (55)
Solange Aoude		**GNE 331** Probability & Statistics (41)	
Iyad Ouaiss			**COE 498** Prof Exp **ELE 498** Prof Exp
Hiba Sukkarieh			**GNE 331** Probability & Statistics (37)
Hassan Saoud			**GNE 331** Probability & Statistics (44)
Leila Issa-Rony Touma			**GNE 333** Engineering Analysis **(28)**
Jean Takchi			**GNE 333** Engineering Analysis (24)

Course #	Course Title	# Sections	Course #	Course Title	# Sections
Fall 2013			**Spring 2014**		
GNE 212	Engineering Mechanics	3	**GNE 212**	Engineering Mechanics	1
GNE 301	Prof. Communication	4	**GNE 301**	Prof. Communication	2
GNE 305	Professional Ethics	5	**GNE 305**	Professional Ethics	3
GNE 331	Probability & Statistics	2	**GNE 331**	Probability & Statistics	3
GNE 333	Engineering Analysis	1	**GNE 333**	Engineering Analysis	1

Course #	Course Title	# Sections	Course #	Course Title	# Sections
Summer I 2014			Summer II 2014 (planned)		
GNE 212	Engineering Mechanics	1	GNE 331	Probability & Statistics	1
GNE 301	Prof. Communication	2			
GNE 305	Professional Ethics	2			
GNE 331	Probability & Statistics	5			
GNE 333	Engineering Analysis	2			

REPORTS OF SCHOOL COMMITTEES

7 ACADEMIC COMMITTEE

7.1 Membership

The School Academic Committee has minimum two representatives from each department and with each member representing a program whenever applicable. The names and affiliation of the membership are as follows:

- Dr. Camille Issa, CIE (Chair)
- Dr. Mahmoud Wazne, CIE
- Dr. Wissam Fawaz, ECE-COE
- Dr. Samer Saab, ECE-ELE
- Dr. Jimmy Issa, IME-MEE
- Dr. Marc Haddad, IME-INE (Secretary)

7.2 Legislative Discussions and Recommendations

Most of the work of this committee was pertained to petitions submitted by students. The most common theme was course overload, course substitutions, and repeats. Some curricular changes concerning course descriptions and pre-requisites were also addressed.

7.3 Operational Recommendations

A new undergraduate program in Mechatronics was approved.

7.4 Petitions

The issue of Probability course being taken as a MTH course or GNE course still represents an unnecessary source of a great number of petitions. Also, the possibility of petitions being submitted electronically is long overdue.

8 ADMISSIONS' COMMITTEE

8.1 Committee Membership

- Mazen Tabbara (CIE)
- Caesar Abi Shdid (CIE)
- Wassim Habchi (MEE)
- Marc Haddad (INE) - Secretary
- Chadi Abou Rjeily (ELE)
- Iyad Ouaiss (COE) - Chair
- Rita Awwad (school representative on the UAC – ex-officio)
- Directors of Admissions (ex-officio)
- SOE Dean (ex-officio)

8.2 Legislative Discussions and Recommendations

The following are the main discussions and recommendations that took place during the 2013-2014 academic year.

8.2.1 Automation of admissions data

A COE student assistant was hired to implement an admissions automation tool. The tool was developed, went through several iterations of review, and is currently assisting the committee in generating admissions decisions on new applicants.

8.2.2 Review of petitions procedures

The committee agreed to sample petitions over the 2013-2014 academic year in order to compare decisions between the old and the newly proposed criteria.

8.2.3 Review of admissions criteria for fall 2014

The committee reviewed the admissions criteria and recommended keeping for fall 2014 the admissions requirements of fall 2013.

8.2.4 Review of bridge program

The committee reviewed and recommended against adopting the Bridge program as is currently.

8.2.5 Applicants with economics baccalaureates

The committee reviewed the Economics Baccalaureates policy and recommended to keep the same policy for fresh ES applicants; but to allow LAU students with ES baccalaureates to petition to transfer to Engineering after securing specific criteria.

8.3 Operational Recommendations

Through sixteen meetings and email circular votes, the committee acted on and recommended admissions for new applicants, change of major applicants, major declaration freshman applicants, and transfer applicants from other universities.

8.3.1 Admissions figures for 2013-2014

The following table provides a summary of the admissions figures for 2013-2014.

Major	Applications (So far 2014)	Accepted (So far 2014)	Accepted (Total 2013)
CIE	257	212	307
COE	116	101	101
ELE	52	46	66
INE	68	58	51
MEE	223	195	230
PTE	29	25	-
Total	***745***	***637***	***755***

Note: The figures above are as of July 3, 2014 and are expected to change prior to the end of the 2014 admissions cycle. Also, the 2013 figures include the USP batch of applicants (about a hundred applicants) most of which were accepted. However, USP applicants are not yet included in the 2014 (if any).

8.3.2 Petitions for 2013-2014

The following table provides a summary of the petitions for 2013-2014.

Major	Petitions	Accepted
CIE	21	13
COE	5	5
ELE	5	4
INE	16	9
MEE	10	6
PTE	3	1
Total	***60***	***38***

Note: The figures above are for both major declaration (from outside the school or from within the school) and change of major petitions submitted for spring 2014 or summer 2014 terms.

8.3.3 Transfer applicants for 2013-2014

The following table provides a summary of the transfer applicants for 2013-2014.

Major	Applications	Accepted
CIE	8	1
COE	1	0
ELE	0	0
INE	0	0
MEE	3	2
PTE	4	2
Total	***16***	***5***

9 FACULTY AFFAIRS COMMITTEE

9.1 Committee Membership

- Dr. Wissam FAWAZ, COE (Chair)
- Dr. Jimmy Issa, MEE (Secretary)
- Dr. Chadi Abou-Rjeily, ELE
- Dr. Mazen Tabbara, CIE
- Dr. Grace Abou-Jaoude, CIE

9.2 Legislative Discussions and Recommendations

The Faculty Affairs Committee (FAC) met 8 times during the 2013 – 2014 academic year. The following summarizes the main items that were discussed as well as the recommendations that were made during these meetings:

9.2.1 Faculty satisfaction with the current yearly performance evaluation system

In a bid to ensure a proper implementation of the action item P3.1.1 of the SoE Strategic Plan, the committee developed a questionnaire that aims at gauging the level of satisfaction of the faculty at the SoE with the current annual performance review process. This questionnaire was then recommended to the SoE Dean.

9.2.2 Annual faculty performance appraisal process

The committee reviewed the dimensions underlying the existing yearly faculty performance appraisal process and recommended basing the process on three dimensions, namely, teaching, research, and services.

- The committee developed the performance criteria/indicators for the teaching and research dimensions of the yearly faculty performance evaluation process but remained inconclusive regarding the way they should be graded.
- The committee defined performance criteria/indicators targeting the services dimension of the yearly faculty performance evaluation process and recommended the rubrics for the evaluation of the newly defined criteria/indicators.

9.3 Operational Recommendations

Based on the various performance criteria/indicators that were defined per dimension of the yearly faculty evaluation process, the following operational recommendations were made:

(b) The inclusion of the annual report prepared by a chair's committee/council as an integral part of the list of evidence pertaining to the service dimension.

(c) The integration of selected questions into the students' exit survey to facilitate the assessment of the quality of advising component of the teaching dimension.

(d) The need to modify the Blue system to allow for:

- The automatic allocation of a score for the quality of instruction component of the teaching dimension.
- The exclusion of the "Laboratory Sessions" section from the online course evaluation forms when it comes to courses not having a Lab component.

10 RESEARCH & FACULTY DEVELOPMENT COMMITTEE

10.1 Committee Membership

- Grace Abou-Jaoude (Ex-Officio)
- Wassim Habchi (Chair)
- John Khoury (Secretary)
- Iyad Ouaiss
- Dani Tannir
- Mahmoud Wazne
- Pierrette Zouein

10.2 Legislative Discussions and Recommendations

The School of Engineering Research and faculty development Committee (SOERC) worked on developing new application forms for travel, research and summer grants to reflect changes in the SOERC Rules & Procedures. These forms are available under login on the SOE web page.

10.3 Operational Recommendations

The SOERC committee decided on applications for Travel, Research and summer grants submitted by SOE faculty members during the academic year 2013-2014. The committee recommended its decisions to Dean Nasr as summarized in the below tables:

10.3.1 Travel grants

The following table provides a summary of the travel grants for 2013-2014.

Application Number	Applicant	Decision
SOERC-T2013-012	Michel El Khoury	Accept
SOERC-T2013-013	Ramy Harik	Accept
SOERC-T2014-001	Barbar Akle	Accept
SOERC-T2014-002	Caesar Abi Shdid	Accept
SOERC1314T005	Charbel Mansour	Accept
SOERC1314T006	Mazen Tabbara	Accept
SOERC1314T007	Camille Issa	Accept
SOERC1314T008	Camille Issa	Accept
SOERC1314T009	Wissam Fawaz	Accept
SOERC1314T010	Rita Awwad	Reject
SOERC1314T011	Wassim Habchi	Accept
SOERC1314T012	Joe Tekli	Accept
SOERC1314T013	Chadi Abou Rjeily	Accept

10.3.2 Research grants

The following table provides a summary of the research grants for 2013-2014.

Application Number	Applicant	Decision
SOERC-R2013-005	Charbel Mansour	Accept

Application Number	Applicant	Decision
SOERC1314R002	Pierrette Zouein	Accept
SOERC1314R003	Dani Tannir	Accept

10.3.3 Summer grants

The following table provides a summary of the summer grants for 2013-2014.

Application Number	Applicant	Decision
SOERC1314S001	Dani Tannir	Accept

11 STUDENT AFFAIRS COMMITTEE

11.1 Committee Membership

(b) Faculty Members:
- Dr. John Khoury
- Dr. Caesar Abi Shdid (Chair, CIE)
- Dr. Dani Tannir (ECE)
- Dr. Charbel Mansour (INE)

(c) Student Members:
- Anthony Francis (Secretary, COE)
- Michel Salibi (INE)
- Nader Mrad (MEE)
- Elie Barakat (ELE)
- Melanie Jabbour (CIE)

(d) University Student Council Representative:
- Ali Hariri

11.2 Legislative Discussions and Recommendations:

During the 2013-2014 academic year, the SAC met seven times including the election of the student members. All meetings have been documented and the minutes posted to the SOE website. During the meetings, the chair distributed the agenda for that meeting and reported back to SAC the recommendations of the Dean relative to issues raised in the previous meeting. Student members had a feeling of belonging and participation in this committee work. In general, all SAC recommendations have been passed on to the Dean's office.

The legislative decisions made through this academic year included:

1. Developing, approving and implementing new SAC elections policies and procedures.
2. Developing and approving guidelines for a student Engineering Scholarship Competition.

11.3 Operational Recommendations

The SAC recommended that student representative elections be conducted by electronic ballot voting at the end of the spring semesters. This was successfully implemented in May and resulted in smooth and streamlined elections.

11.4 Other Business

The SAC student members raised the issue of lack of any after-hours activities on campus to encourage student to spend more time on campus. The SAC student representatives recommended that the SAC work with student clubs to organize such activities.