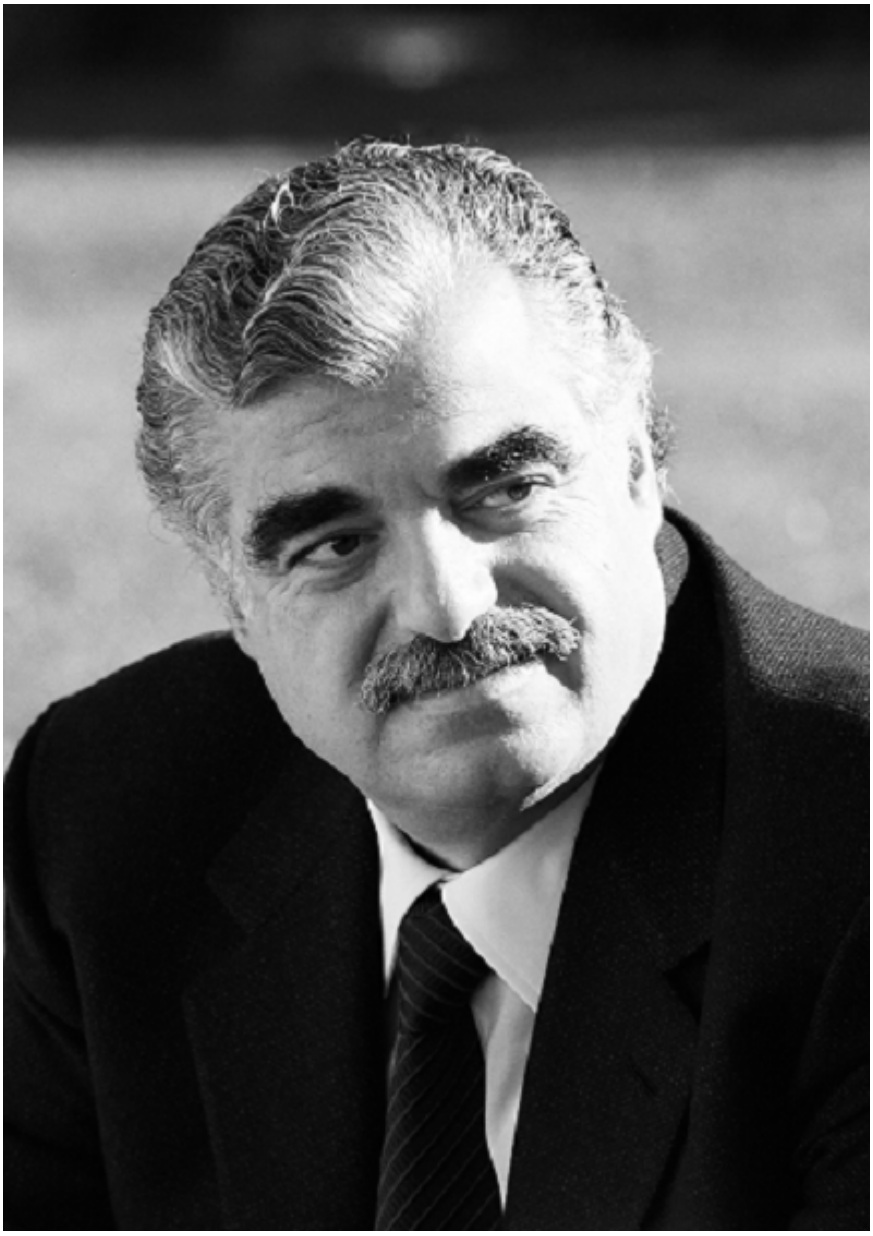
Rafik Hariri University
جامعة رفيق الحريري

GRADUATE CATALOG

2018-2019

Higher Education as it Should Be



"إن أملي هو فتح أبواب الجامعات والمعاهد العليا أمام المواهب والكفاءات المغمورة"

Notice

Information in this catalog applies to the 2017-2018 Academic Year as of September 4, 2017. The University reserves the right to make changes without prior notice in programs, course offerings, academic requirements, and teaching staff as deemed to be in the best interest of students.

This catalog has been drafted to conform to the related Lebanese laws and Directorate of Higher Education (DoHE) rules and regulations. In the event of a contradiction, the Lebanese laws and DoHE rules and regulations take precedence.

Student Responsibility for Catalog Information

Students are responsible for reading, understanding and adhering to the information in this catalog. Ignorance of the stated university, college and program regulations will not exempt students from the ramifications of their Failure to comply with them and the penalties that may incur.

Contact Information

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This catalog can also be viewed at www.rhu.edu.lb

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MESSAGE FROM THE PRESIDENT

Welcome

How many times in a normal day do we hear, see, or experience astonishing innovations that constantly shift the perimeters of the playing field and irreversibly transform the norms we have barely come to understand. To have a chance to look at the rear view mirror and reflect on past events is becoming a rare amenity. “Times they are” truly “a changing”, and fast!

The impact of innovation on every facet of life are astonishing. The most telling of contemporary terms is that we live “at an inflection point” of the human experience where the dark side of globalization and technology, climate change, and rise of extremist forces are ominous signs of a gathering storm that has the potential to leave a calamitous impact in its wake; that is for those who do not heed the warning signs and foment the weathering change.

Higher education does not operate outside the influence of change. At no time in human history has education been as important in developing the capacities and instruments of constructive change as it is today. Whatever action universities take to respond to a constantly changing reality stands no chance of success unless the time-enduring principles of higher education are upheld: propagating relevant knowledge to impact growth, setting free innate creativity to extend human possibilities, sowing hope to confront despair, fomenting reason to allay fear, and to cultivating a responsible way of being to safeguard the human progress. At every turn in history when challenges seemed to hurtle humanity towards the abyss, the human spirit and genius were able to fashion the tools that set the course right. This maxim still rings true. The next big set of ideas needed to save the world from its folly is out there to be unearthed and the biggest role of higher education is to create the conditions for those ideas to germinate.

This is the principle that impelled Rafik Hariri to found the University that bears his namesake. A visionary, a leader and a philanthropist, Rafik Hariri believed that education is the one human option that stands to leverage human potential and influence positive change most.

To our students and to all, this we pledge: an educational model that challenges the norms, a transforming learning experience that prepares for a lifetime of meaning, and an unwavering commitment to constantly refine the path to a future manifest with settings that are symbiotic with the hopes of the community that we dream of. Lest we forget, all this transpires on a campus where man and nature blend in an awesome harmony.

I care.

Ahmad Smaili,

President.

BOARD OF TRUSTEES

Mrs. Nazik Rafik Hariri, Chairperson

HE Charles Rizk

HE Ghazi Youssef

HE Adnan Mroueh

Dr. Daoud Sayegh

Dr. Nahla Houalla

Mr. Mohamad El-Hout

Mrs. Salwa Siniora Baasiri

Mr. Fadi Fawaz

Prof. Ahmad Smaili, President

ACADEMIC CALENDAR 2018-2019

Fall Semester		
Tue-Thu	Jul 17-19	Orientation and Registration / New Students Fall 2018
Tue-Thu	Aug 14-30	Payment of Fall 2018 Tuition and Fees
Tue-Thu	Aug 21-23	Eid Al-Adha/ Holiday*
Mon	Sep 3	Classes Begin
Tue-Thu	Sep 4-6	Drop and Add Period
Tue	Sep 11	Hijra New Year / Holiday*
Thu	Sep 20	Ashoura Day / Holiday*
Thu	Nov 1	Founder's Day
Mon-Fri	Nov 12-16	Advising Week / Spring 2019 for Continuing students
Wed	Nov 14	Last Day to Withdraw from Courses
Tue	Nov 20	Prophet's Birthday/ Holiday*
Thu	Nov 22	Independence Day / Holiday
Mon-Fri	Nov 26-30	Registration Week / Spring 2019 for Continuing student
Tue-Wed	Dec 4-5	Orientation and Registration / New Students Spring 2019
Wed	Dec 12	Last Day of Classes
Thu-Fri	Dec 13-14	Reading Period
Mon-Fri	Dec 17-21	Final Examinations Period
Thu-Thu	Dec 20 – Jan 3/2019	Payment of Spring 2019 Tuition and Fees
Tue	Dec 25	Christmas / Holiday
Tue	Jan 1	New Year / Holiday

Spring Semester		
Sun	Jan 6	Armenian Christmas / Holiday
Mon	Jan 7	Classes Begin
Tue-Thu	Jan 8-10	Drop and Add Period
Sat	Feb 9	Saint Maroon's Day / Holiday
Thu	Feb 14	H.E.P.M Rafik Al Hariri Commemoration Day
Mon-Fri	Mar 11-15	Advising Week / Summer–Fall 2019 for Continuing student

Fri	Mar 15	Last Day to Withdraw from Courses
Mon-Tue	Mar 18-26	Registration Week / Summer –Fall 2019 for Continuing student
Mon	Mar 25	Annunciation Day / Holiday
Wed	Apr 17	Last Day of Classes
Wed	Apr 17	Fall 2019 Financial Aid Applications Submission Deadline
Thu	Apr 18	Reading Period
Fri-Mon	Apr 19-22	Easter / Latin Holiday
Tue-Thu	Apr 23-May 2	Final Examinations Period
Tue-Fri	Apr 23 – May 10	Payment of Summer 2019 Tuition and Fees
Fri-Mon	Apr 26-29	Easter / Greek Orthodox Holiday
Wed	May 1	Labor's Day/ Holiday
Sat	Jun 15	Commencement Exercise (Tentative)

Summer Semester		
Wed	May 22	Classes and Co-op Work Experience Begin
Thu	May 23	Drop and Add Period
Tue-Thu	Jun 4-6	Eid El Fitr/ Holiday*
Thu	July 4	Last Day to Withdraw from Courses / Co-op
Thu	July 18	Classes and Co-op Work Experience End
Mon-Tue	July 22-23	Final Examinations Period

* Tentative dates pending moon sightings.

P.S. Any changes in public and religious holidays shall be reflected on our calendar in due time.

DIRECTORY

	Location	Extension
Admissions Office	Block E	405/406/407
Bookstore	Block I	753
College of Business Administration	G 101J	301
College of Engineering	C 103	501
College of Arts	F 105K	201
College of Sciences and Information Systems	I 201	701
Communication and Alumni Relations	B 201	754/755
Dorm Supervisor	A 112	112
Directorate for Quality Assurance and Institutional Advancement	I 219	783/799
Finance Department	Block E	424/417-419
Graduate Studies and Research	Block B	611
Gymnasium	Block G	330
Health Clinic	I 119	751
Help Desk	Block G	333/334
Human Resources	Block E	787/786
Library	Block E	434/435
Media Center		754/755
Operator	Block E	0
President's Office	Block E	441/442
Purchasing and Procurement Department	I 111, I 112	743/744
Registrar's Office	B 102	615/618
Security		290
Store	Block I	752
Student Affairs Office	Block E	770/777
Support Services Department	I 110	740/741
Acting Vice President for Academic Affairs	Block E	442
Vice President for Development and Information Technology	Block E	403
Vice President for Administration & Finance	Block E	402

THE UNIVERSITY OVERVIEW

UNIVERSITY ADMINISTRATION

Ahmad Smaili, President

Ahmad Smaili, Acting Vice President for Academic Affairs

Hisham Kobrosli, Vice President for Development and Information Technology

Najib Arabi, Vice President for Finance and Administrative Affairs

Board of Deans

Ahmad Smaili, Acting Vice President for Academic Affairs

Hisham Basha, Dean – College of Engineering

Jamil Hammoud, Dean – College of Business Administration

Mohamad Al Ladan, Dean – College of Sciences and Information Systems

Hiam Loutfi, Chair – Languages and Humanities Department

Admission

Zeina Tannir, Director

Communication and Alumni Relations

Rafal Tabbaa Khayat, Director

Finance Department

Sobhiya Doughaili, Manager

Human Resources Department

Doriah Naboulsi, Manager

Information Technology

Wassim Mallah, Assistant Director

Library

Ayda Al Ashi, Library Coordinator

Quality Assurance and Institutional Advancement

Ms. Mirna Talhouk, Assistant Director

Registrar

Nidal Khalaf, Registrar

Student Affairs

Sahar Hallak, Student Affairs Coordinator

Support Services Department

Ahmad Sabeh Ayoun, Director

THE UNIVERSITY

History

The establishment of an educational institution, accessible financially and geographically to all, was a pressing dream for His Excellency Prime Minister Rafik Hariri. In the early 1980s, PM Hariri chose Kfarfalous, an area between the South, Bekaa, and the mountains, to be the location for establishing a hospital and a university in collaboration with the University of Saint Joseph. However, the 1982 Israeli invasion led to the virtual destruction of the university and the theft of its equipment.

In 1984, the dream took a different turn with the establishment of the Rafik Hariri Foundation, a non-profit organization whose major goal was to provide the Lebanese youth with a chance for higher education in local and international universities. Around 33,000 Lebanese students benefited from the University Loan Program of the Rafik Hariri Foundation, and pursued their education in Lebanon, Europe, North Africa, and North America.

The end of the civil war in Lebanon led the Rafik Hariri Foundation to revive the dream of establishing an affordable, accessible university. The undertaking of such a project required the help of experts from a country that had made great strides in the field of education. Although several educationally advanced countries were considered, experts from Canada were eventually chosen for this collaboration. The programs of study at Rafik Hariri University were developed in association with a number of Canadian institutions, including the Canadian Bureau of International Education, the Canadian International Development Agency, Capilano University and Memorial University.

Rafik Hariri University, whose aim is to provide affordable, high quality education and to supply knowledgeable and competent graduates to meet Lebanese and regional job market demands, became a reality and opened its doors for the first time on September 15, 1999, with the College of Business Administration, according to Presidential Decree 1947. It opened with a student population of 75. After its Colleges of Engineering and Sciences and Information Systems were established, RHU was granted university status on June 19, 2006, by Decree Number 17192.

Vision

RHU envisions becoming a beacon of knowledge, a brand for academic distinction and a force of meaningful transformation by fostering a culture of quality, instituting authentic learning conditions, and supporting purposeful research to advance knowledge and nurture leaders capable of driving development and contributing to the enrichment of the community - immediate and beyond.

Mission

RHU shall: institute a culture of quality by committing to due process, academic excellence and hard-work; set up learning conditions conducive to farming dreams, stimulating imagination and cultivating passion to forever learn; instill the values of responsible behavior, tolerance, and freedom of self-expression and thought; and align learning outcomes with emergent community needs to ultimately transcend students' potential, possibilities, and contribution beyond time and distance.

Values

When it comes to values, we do not merely pay lip service. We are indeed deeply committed to a number of core values that we uphold and fulfill:

Shared Governance. Enable all RHU constituents to participate in shaping the provision of quality higher education.

Excellence. Offer a meaningful contribution to the development of knowledge and promoting excellence in teaching and administrative support.

Integrity. Operate with fairness, honesty, openness and the highest ethical standards to sustain a community of trust.

Diversity and Tolerance. Create a community that advocates and promotes diversity and tolerance as a priority of academic and civic life.

Community Service. Show commitment to serving our community through responding to the needs and concerns of all stakeholders.

Purposeful Learning. Engage students in a learning experience congruent with the dreams of individuals and the needs of the community.

Location and Climate

RHU is located in Mechref, Damour, 20 kilometers south of Beirut. The campus sits on a hill overlooking the Mediterranean Sea, above the Mechref Village, a residential project with altitudes ranging from 30 to 560 meters above sea level. The climate is moderately cold from December to March and moderately hot from June to September.

The 54,000-m2 campus has nine main buildings. Seven buildings are used for educational purposes, one for the administration, and one for faculty and student residences.

The lush greenness of the RHU campus creates a refreshing ambience and provides further incentive for students to pursue their academic goals. The green lawns provide ample space for students to study, relax, or socialize. The mosaic of blue, green, and white – a blue sky, green lawns, and white buildings – of the RHU campus is itself splendor.

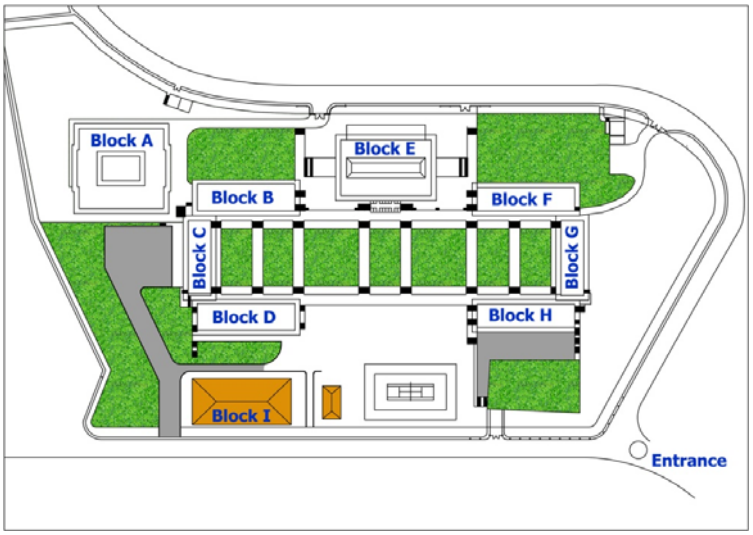
Directions and Map

From Beirut

Take the Beirut Saida Highway south (towards Saida)
Take the Damour main exit (towards Deir Al-Qamar)
Go left on the roundabout (follow the Mechref Village road sign)
Drive for 300 meters
Take a right at the Mechref Village main gate
Follow the RHU signs leading to Campus

From Saida

Take the Beirut Saida Highway north (towards Beirut)
Take the Damour main exit (towards Deir Al-Qamar)
Go left on the roundabout (follow the Mechref Village road sign)
Drive for 300 meters
Take a right at the Mechref Village main gate
Follow the RHU signs leading to Campus



Map of the RHU Campus

GRADUATE PROGRAMS AND DEGREES

Graduate programs at RHU aim to provide qualified students a graduate studies experience that helps them realize their potential as they seek to further their education. The College of Business Administration grants a general Master of Business Administration (MBA) degree and a Master of Business Administration (MBA) in Oil and Gas. The College of Engineering grants Master of Science (MS) degrees in six engineering programs

The number of credits to earn an MBA degree is 36, after completing the 99 credits required for a Bachelor of Business Administration degree.

The minimum number of credits to earn an MS degree in engineering depends on the earned undergraduate degree and on whether a student follows a thesis or a non-thesis path. According to the Ministry of Education and Higher Education (MEHE) decree, an MS granting program must ensure that a student completes a minimum of 155 credits beyond the Lebanese Baccalaureate or its equivalent. Therefore, a student who earns a Bachelor of Science degree from a 114-credit program must complete a minimum of 41 credits to earn a thesis-based MS degree. Meanwhile, a student who earns a Bachelor of Engineering degree from a 146-credit program (excluding Co-op credits) must complete a minimum of 9 credits to earn a thesis-based MS degree. Non-thesis track students must complete an additional three credits, for a total of 158 credits beyond the Lebanese Baccalaureate or its equivalent.

In addition to the above requirements, students who had earned a Bachelor of Engineering Technology (BET) degree from an IUT are required to take 24 credits of remedial courses for the BET degree to become equivalent to a Bachelor of Science degree in engineering. Additional 36 graduate credits are required to earn an MS degree.

The programs and the number of credits required for graduation beyond a Bachelor degree are summarized below.

Minimum MS degree Requirements			
Undergraduate studies		**MS Degree Minimum Credits Requirements**	
Degree	**Credits Earned**	**Thesis Option**	**Non-Thesis Option**
Bachelor of Science	114 Credits	48 Credits	51 Credits
Bachelor of Engineering	147Credits	15 Credits	18 Credits

Details on the existing graduate programs, graduation requirements and pertinent regulations are presented in this catalog.

ADMISSION

Zeina Tannir, Director of the Admissions Office
Sawsan Sheikh Younes, Associate Director of the Admissions Office
Block E
Phone: (961) 5 603090; Ext 405/406/407
E-mail: admissions@rhu.edu.lb
www.rhu.edu.lb/admission

Admission to graduate programs is based on merit. It is offered to applicants holding undergraduate degrees from RHU or other recognized institutions. Students can apply to graduate studies for the summer, fall or spring semesters. Applications are available at the Admissions Office or may be downloaded from RHU's web site: www.rhu.edu.lb

The Admissions Office receives admission applications, communicates with the applicant to complete the application dossier, responds to inquiries, coordinates with the academic units and the University Graduate Studies and Research Committee, and conveys admission decisions and related stipulations to the applicant. Admission to a graduate program is granted on competitive basis and early admission may be granted to students with strong undergraduate records. Applications may be submitted via mail, email, or in person. For details on admission requirements, application deadlines, procedures and fees to various University programs, please refer to the Admission section in this catalog or visit www.rhu.edu.lb/admission/.

Deadlines

The applications to master's degree programs and decisions rendered by the departments and concerned colleges proceed according to the following timeline:

1. Applications for admission to the master's programs should be received by the following dates of every year for early consideration: April 15 for summer or fall admission and November 15 for spring admission;
2. Applications received after the deadlines will be considered on a rolling basis;
3. A complete application must include at least two letters of recommendation from professors or supervisors of the applicant and an official transcript including at least the end of the first semester of the senior year or its equivalent;

4. Admission decisions on applications received by the dates specified in item 1 above are to be announced by the following dates: April 30 for summer or fall admissions and November 30 for spring admissions;
5. Potential students are given one month of the notification date to decide on accepting admissions and the assistantship, if offered, or risk losing the latter;
6. Students who are eligible to be admitted on probation will be notified by the April 30 and November 30 deadlines;

Admission Criteria

An applicant with a bachelor degree from RHU or other recognized institution will be admitted to graduate studies at RHU if the college to which the applicant proposes to study deems the applicant has high potential for success in the graduate program. Applications are reviewed and final recommendations are made by the concerned college on a case by case basis. An applicant who has received the bachelor degree from RHU is exempted from taking the GRE or the GMAT.

Depending on the record, an applicant is admitted either on a regular basis or on probation.

Regular Admission

Regular admission to a Master program is granted to a student who has:

- Attained an average of 80 at RHU or its equivalent at a recognized institution as determined by the college;
- Adequate English proficiency as established by the University;
- At least two letters of recommendation from faculty or supervisors familiar with the academic ability of the applicant.

Note that the English Proficiency requirement may be waived for students having a bachelor degree from an English teaching institution.

Admission on Probation

Acceptance on Probation may be granted to an applicant who meets the regular admission requirements stated above but has an undergraduate CGPA below 80 at RHU or its equivalent at other universities as determined by the college. Students admitted on probation may be requested to take background courses to strengthen their prospects of

success in graduate studies. Credits of background courses do not count toward completing the graduation requirements but are included in the CGPA.

A student accepted on probation must complete a minimum of 12 credits of background (in case they are required) and graduate level courses, or nine credits of graduate courses, in no more than two regular semesters, pass all courses and attain a CGPA of at least 80.

Special Admission Consideration

A holder of a bachelor degree who does not meet the RHU graduate admission criteria but has considerable practical experience is requested to sit for an interview with the College Graduate Studies Committee (CGSC) formed and chaired by the Dean. Based on the assessment of the candidate's aptitude for graduate studies, the CGSC may make one of the following recommendations:

- Accept the applicant on probation and require him/her to take a set of background courses and attain a minimum average of 80 in each course to continue as a regular student.
- Require the applicant to take the RHU Graduate Entrance Exam (GEE) prepared to assess the candidate's competence level in Mathematics and the discipline study area. Based on the results of the exam the CGSC committee recommends that the candidate be accepted on probation, take a set of courses and earn a minimum score of 80 in each course to continue as a regular student.
- Require the applicant to submit GRE scores for admission to the College of Engineering or the GMAT scores for admission to the College of Business Administration and based on the acquired score the CGSC identifies the candidate's areas of weakness or gaps of knowledge and recommends that the candidate takes a set of background courses to improve his/her competency level.

English Language Proficiency Requirements

English is the language of instruction in all programs offered at RHU. Applicants must therefore demonstrate English language proficiency by passing the RHU English Entrance Exam or by achieving a minimum score on Standardized English competency exams as follows:

Standardized English Exam	Minimum Scores
Institutional TOEFL (ITP)	550
Internet Based TOEFL (IBT)	80
IELTS	6.5
SAT I Writing Section	400 on Old Exam; 22 on the New Exam

Students who fail to attain the requisite score will be required to enroll in the Intensive English Language Program (IELP) to achieve the necessary English proficiency. The IELP consists of four levels and the student is placed in the appropriate level based on the English proficiency examination score. Student can skip ENGL 101 if he/ she attains the required score for ENGL 210 stated above.

RHU recognizes an Institutional TOEFL score to be valid for one year from the date the test was taken. However, an International TOEFL score, IBT score, SAT I (writing section), and IELTS score are valid for two years.

Applicants may choose to sit in for the RHU administered TOEFL or may contact the AMIDEAST Office in Beirut (Solidere District, Riad Solh Street, Bazerkan Building– Tel: 01/989901) to register for the TOEFL or SAT Exams. When registering for TOEFL, SAT I and SAT II, applicants must specify the RHU code 4438 in order for the results to be sent to the RHU Admissions Office.

Application Package

To be considered for admission to graduate studies at RHU, applicants must submit the following documents (RHU graduates are not required to submit the documents of items 1 through 5):

1. A certified copy of the undergraduate degree;
2. Official transcripts and the university catalog;
3. A certified copy of the Lebanese Official High School Certificate or its equivalent;
4. Sit for RHU English Entrance Exam or submit one of the standardized English Competency Exams.
5. Two letters of recommendation;
6. Original Civil Status Record (for Lebanese applicants);
7. Photocopies of passport and residence permit (for non-Lebanese Applicants);
8. Six identical recent passport-size colored photos;

9. A non-refundable application fee of LL 100,000 paid in cash at RHU or by a certified check payable to “Rafik Hariri University”.

Graduates of Technical Institutes

Holders of a Bachelor of Engineering Technology from a technical institute are eligible to join the MS program in an engineering field related to the diploma. To be accepted, the MEHE requires that a student must take 24 credits of undergraduate courses to make the level equivalent to that of Bachelor of Science in engineering degree. The grades achieved on the remedial courses shall not be used in calculating the CGPA.

Tuition Fees

Tuition Fees

The University tuition fees are determined by the Board of Trustees on an annual basis. Tuition and fees may be increased annually without prior notice. Currently applied tuitions and fees are posted on the University Website: www.rhu.edu.lb.

Program	Fee/Credit (L.L.)
Engineering	445,000
Business Administration	330,000
Freshman	330,000
Education	300,000
Journalism	300,000
English Language	300,000
Teaching Diploma	300,000
Graphic Design	435,000
Interior Design	435,000
Computer Science	325,000
Health Care Information Systems	325,000
Mathematics	325,000
Master credits - all programs	585,000
Intensive English (IELP 070, 085, 095)	2,200,000
Intensive English (IELP 100)	1,250,000

Other Fees

Type of Services	Fees in L.L.
Non-refundable application fees for joining the University*	100,000
Enrollment fees – upon acceptance*	250,000
Deposit fees – upon acceptance**	250,000
NSSF	202,500
Campus life	70,000
Internet	135,000
Co-op	1,075,000
Deferred payment***	
Regular semester	40,000
Summer semester	25,000
Late Registration****	120,000
Late Payment*****	60,000
Transportation – optional	
Regular shuttle – Fall or Spring semester	600,000
Regular shuttle - Summer semester	300,000
Campus shuttle - Fall or Spring semester	180,000
Campus shuttle - Summer semester	90,000
Parking fee - Fall or Spring semester	50,000
Parking fee - Summer semester	25,000
Dormitory/Housing - optional	
Double room in a shared apartment- Fall or Spring semester	1,050,000
Double room in a shared apartment - Summer semester	525,000
Single room - Fall or Spring semester	1,650,000
Single room - Summer semester	825,000
Registration	225,000
Deposit	300,000

*Enrollment fees: Non-refundable fee assessed to new students upon the decision to join RHU and would be credited to the tuition fees.

**Deposit fees: A fee assessed to new students upon the decision to join RHU and is refundable only upon graduation

***Deferred payment: payments of tuition fees will be scheduled over four installments for fall and spring semesters and two installments for a summer semester

****Late registration: A student is required to register during the registration period otherwise a late registration fee of 120,000 L.L. will be added.

*****Late payment: late payment charge of 60,000 L.L. shall be charged for any installment not paid by the established deadline

Other Notes:

1- Students with financial holds will not have access to their grades and will not be able to register during the normal registration period.

2- Students with outstanding financial holds are not eligible to get any official document from the university unless the holds are cleared.

The background undergraduate credits taken by graduate students will be assessed the tuition fees of undergraduate credits.

Payment Methods

Payment Methods

Students are required to pay all tuition balance and other university fees by the announced deadlines to avoid late payment fees and the risk of courses being dropped. Once the student register for a course, he/she shall remain accountable for all applicable tuitions and fees until he/she drops the course formally by the drop/add deadline. Refer to the academic calendar at www.rhu.edu.lb for applicable deadlines.

Payments must be made by the announced deadlines through one of the following methods:

1. At one of the Bank Med branches, each student is required to download his/her statement of fees from RHU's student information system (SIS) to print it and present it to the bank at the time of payment.
2. Bank transfer to RHU's bank account:
    a. Branch BankMed, Raouche Branch
    b. IBAN# LB04 0022 0000 0000 1930 5000
    c. SWIFT MEDLLBBX
3. Pinpay is a bill payment mobile app. (It requires the student to be registered in Pinpay). (Access the Pinpay app-login by entering your password at the upper left button- from home screen press on "Education" button- select RHU- Enter your student ID- press next- confirm your password- your payment should be completed)

4. Credit card at the finance department (in this case extra fees will be charged).

All student payment will be automatically deferred over four payments for fall and spring semesters and over two payments for the summer semester.

Tuition Refund

In case any student has decided to drop an **already** paid course (s), the following will be applied:

1. During the drop and add period, paid fees of the dropped course(s) will be credited to the student's statement of fees in full.
2. After the drop and add period no refund will be applied, unless the student withdraws due to emergent circumstances. Refer to the withdrawal section of the catalog for more information.

If a student decides to officially withdraw from the University, then the following will be applied:

1. He/she is eligible for a refund of 75% of the semester paid tuition if the withdrawal is approved before the classes begin,
2. He/she is eligible for a refund of 50% if the withdrawal is approved during the drop/add period and,
3. No refund is applied for withdrawing after the drop/add period.

Clearance and general deposit refund

Upon completion of the graduation requirements, the student has to fill out a clearance form which can be obtained from the registrar's office. Upon filling out the form and securing the required signatures the general deposit can be refunded to the student within a period that does not exceed four months beyond the graduation date.

Dorm deposit is refundable upon graduation & leaving dormitory facility.

P.S. All deposits will be refunded after deducting any outstanding balances.

Transfer of Credits

A graduate course taken beyond the requirements for the bachelor's degree at RHU or other recognized institutions may be transferred for graduate credits at RHU provided that the course grade is 75 or above. A maximum of six credits may be transferred.

Approval of the department concerned and the CGAC is required for all transfers.

Transfer Graduate Students

Graduate credits earned in a recognized institution other than RHU can be transferred subject to the following rules on a case-by-case basis:

- Attained a grade of 80 or above;
- A maximum of 12 credits is transferred for graduate credits beyond a Bachelor of Science in engineering or a Bachelor of Business Administration.

Transfer of Credits from One Master's Degree to Another

Graduate courses taken beyond the courses required for a master's degree at RHU may be transferred to another master's degree program at RHU. The following conditions apply: (1) The applicant earns a grade of 80 or above in the courses to be transferred; (2) A maximum of six credits may be transferred if courses are relevant to the new graduate program.

Approvals of the department concerned and the GSRC are required for all transfers.

REGISTRAR'S OFFICE

Nidal Khalaf, Registrar
Amani Baasiri, Assistant Registrar
Block B
Phone: (961) 5 60390, Ext: 615/618.
Email: registrar@rhu.edu.lb
www.rhu.edu.lb/registrar

The Registrar's Office administers academic processes; enforces academic regulations and tracks students' academic progress. The office coordinates closely with academic advisors and academic units to guarantee the accomplishment of the following responsibilities: implementing updated study plans; maintaining student's academic records; enforcing University academic regulations, policies and bylaws; tracking students' performance and generating students' statistical reports; preparing courses and exams schedules; assigning classrooms; registering students for the correct classes; issuing transcripts; verifying graduation lists; ensuring up-to-date CampusVue records and information; and updating and publishing University calendar and catalog.

The Registrar's Office uses CampusVue Students Information System to implement academic processes and maintain students' records in coordination with the MIS team at the IT Center. Students and faculty have CampusVue personal secured accounts to access relevant records, courses, schedules, grades, etc.

For registration procedures, deadlines and related issues please refer to the Registration section in this catalog or visit: www.rhu.edu.lb/registrar

Registration

Students, after consulting with their academic advisors, must register for the courses they intend to take during the registration period noted in the academic calendar, presented in this catalog and posted on the University website www.rhu.edu.lb/. During the registration period, academic advisors assist the students to prepare the course schedules by completing the Course Registration Forms and activating personal online CampusVue registration. Copies of the Course Registration Forms must be sent to the Registrar's Office after the drop/add period for verification of students' schedules and archiving. Any course registered online by the student without prior approval of the academic advisor shall be automatically dropped.

The course schedule must comply with the following rules: the pre-requisite(s) of the courses the student intends to take were completed, the courses are required by the program and are taken in the order noted in the program's study plan, failed courses are taken when first offered, and the maximum and minimum load rules are met. After completing the registration, the student must print the statement of fees and proceed to pay all applicable tuition and fees by the announced deadlines. Failure to meet financial commitments may result in dropping the class schedule.

National Social Security Fund (NSSF)

The Lebanese Law mandates that all Lebanese students be registered as members of the NSSF. This requirement does not apply to Non-Lebanese students. A Lebanese student admitted to RHU must complete the Social Security Application form that is dispatched with the admission letter. On the form the student indicates:

- NSSF status (beneficiary or not)
- NSSF number if already registered (employed students only)
- NSSF number of parents (if beneficiary)
- An official attestation of the type and source of all benefits including NSSF

Refer to Student Services section for more information on NSSF matters.

Passport and Visa

Expat students admitted to RHU must have their passport valid for 13 months from the date they join RHU and must obtain a visa from the Lebanese Embassy in the country of origin.

ACADEMIC REGULATIONS

Once accepted in a graduate studies program, the following regulations apply:

Period of Study

All requirements for the master's degree must be completed within a maximum period of four years after admission to the graduate program. Extension beyond the maximum allowed period of study requires justification and approval by the CGSC and the VP of Academic Affairs.

Orientation

During the first semester of graduate work, the concerned department will arrange for a meeting to explain the graduate studies policies and help graduate students get acquainted with the faculty and their research interests. This is intended to help expedite students' selection of a project topic and advisor.

Supervision

During the first semester of graduate studies at RHU, the department concerned shall designate an interim academic adviser to guide students in planning a course of study for the semester and acquaint them with the graduate studies policies and procedures. By the end of the first semester, each student must choose an advisor, prepare a plan a study and complete the GS-1 form.

Courses and Grades

Courses taken as part of a student's graduate study program fall in one of two categories: background courses and graduate courses.

Background Courses

Students accepted to a graduate program may be requested to take a set of background, usually undergraduate courses that do not carry graduate credits but are required to make up for any deficiencies in the student's background. The following conditions apply to background courses:

- The number and level of pre-requisite courses are part of the plan of study as set by the college at the time of admission.
- Background courses must be registered first if offered,
- A student may repeat a course for which a grade less than 80 is earned only once
- A maximum of two background courses may be repeated for grade improvement.

Failure to meet these conditions results in the student's automatic dismissal from the graduate program.

Graduate Level Courses

The minimum passing grade of a graduate course is 70. Students in the graduate program are required to maintain a cumulative average of at least 80 in all courses taken for graduate credit.

Course Load

The maximum course load for a graduate student is 12 graduate credits per regular semester. Students on probation can register a maximum of 9 credit hours per semester. Students who are employed during their graduate studies are strongly advised not to take more than six credits.

Plan of Study

By the end of the first semester, a graduate student and her/his Academic Advisor must complete the Proposed Program of Study form (GS-1) which includes a tentative plan of study. This program of study is submitted to the Chairperson of the concerned Department for approval then to the Dean of the College. Once approved, this document becomes part of the student's permanent record.

Academic Standing

Regular Standing

Regular standing status is attributed to a graduate student who maintains a cumulative GPA of 80 or above and has not failed any course.

Warning

A student receives an academic warning if his/her SGPA in any regular semester falls below 75 while maintaining a CGPA 80 or above and has not failed any course.

Academic Probation

Academic Probation is applied to a student who fails a course taken for graduate credit and/or has a CGPA less than 80. Academic probation must be removed in two regular semesters after being placed on probation. During this period, all failed courses must be repeated and successfully passed. If a failed course was not offered during the probation removal period it must be successfully repeated when first offered.

Repeated Courses

A graduate course may be repeated only once.

Dismissal

Dismissal from the graduate program applies to a student who:

- Attains a Semester GPA less than 70;
- Fails to remove probation in two consecutive regular semesters irrespective to the number of earned graduate credits;
- Failed a course more than once.
- Placed on probation more than once.

Graduate Assistantship

Rafik Hariri University (RHU) offers a limited number of merit-based assistantships to graduate students under the Graduate Assistant (GA) Program every term, excluding summer. This form of scholarship provides limited financial support to qualified graduate students for services they render to the University. Refer to the chairperson of the department for more information and submission of application.

Graduation Requirements

To be eligible for graduation with a master's degree, a graduate student must have:

- Completed the credit hours of course work required by the program;

- Completed the thesis/project requirements and submitted a copy of the thesis/project to the library;
- Met the period of study requirements;
- Passed all courses; and
- Attained a CGPA of at least 80.

Note: Please refer to the related college section for additional college requirements that may apply.

LIBRARY

Ms. Ayda Al-Ashi, Library Coordinator
Block E
Phone: (961) 5 603090; Ext: 434/435
E-mail: library@rhu.edu.lb
www.rhu.edu.lb/library

Rafik Hariri University Library provides students, faculty and staff the resources and services they need to succeed in their educational and research undertakings. The library building occupies more than 650 square meters of space offering users ample study and computing commons; halls for meetings, seminars and conferences; classrooms; faculty development centers; praying rooms; executive meeting rooms. The library holds collections in The Arts, Humanities, Computer, Social Sciences, Business and Economics, Accounting, Finance, Management, History, Engineering (Civil, Mechanical, Mechatronics, Biomedical and Electrical) Education, Literature and Languages News and Newspapers, Science and Technology, and History. The library applies international standards and implements modern technologies in all functions and services. RHU Library provides resources to academic programs in the form of books, journals and multimedia resources. Current collections include more than 7710 printed book items and 154,506 electronic books covering 160 subject area, and more than 25,819 titles from journals, conference proceedings, reports, magazines, newspapers, working papers, and videos. The repository currently includes all RHU graduate student senior projects and theses. Use of these resources is subject to copy right law and the license agreements that RHU signs with the e- resources providers. The Library has a modern IT infrastructure which includes:

- An integrated library system (SIERRA) that embeds all library functions, services, and auxiliary tools that enable access to resources on and off campus.
- Workstations located in the references area and connected to the Internet to access online catalogs, e-databases, Turnitin and other resources.
- An Internet lab equipped with networked computers loaded with the latest applications.
- Multi-media rooms equipped with state-of-the-art tools, computers, video projectors, data shows, CD writers, scanner, etc.
- Wireless connectivity covers all library spaces.

RHU continues to develop and improve library resources and services in response to changes and emergent needs; participate proactively in the enrichment of the educational experience; improve information technology and multimedia assets; repurpose available space to accommodate changing library role; and improve community outreach and branding.

Information Resources

Collections available at RHU Library include a wide range of information resources to support all academic disciplines and meet the needs of University faculty and students. In addition to maintaining traditional printed resources in form of books and periodicals, the library holds a collection of electronic resources and multimedia materials. The library home page provides links to the full-text online databases, e-journals, e-books, research databases and online catalog. The homepage also includes information about library policies, service hours, auxiliary tools and services. See https://rhu.edu.lb/Library.

Organization of Materials

Library resources are organized in accordance with International standards and best practices. All print resources are arranged and catalogued according to Dewey Decimal Classification 21 and MARC21 formats and standards which are used to build bibliographic databases.

Library Services

The library staff assist users in using library resources and respond to enquiries received in person, by phone, by email or through the library home page electronic forms. The staff also organize specific training sessions to help users improve their skills in searching and retrieving relevant information. Faculty, students and staff holding valid ID cards may borrow library materials in accordance with the circulation policy. Faculty members may request putting books and other materials on reserve for use by students inside the library premises for a period of time. Computer commons allow users on-site access and retrieval of resources. Media resources, copiers and printers are available for use inside the RHU Library. Pre-paid cards may be purchased to use the printing and the photocopying machines.

Library Clearance

Graduating students are required to submit one hard and one soft (pdf) copy of their thesis/ senior projects according to RHU library format (Turabian format) They should check with their librarian and get approval for publication before printing .

INFORMATION TECHNOLOGY DEPARTMENT

IT Helpdesk
Phone: (961) 5 603090 Ext: 333
Email: helpdesk@rhu.edu.lb
www.rhu.edu.lb

The Information Technology Department exists to provide optimal IT solutions to support the University students, faculty, and staff in their quest to achieve excellence in teaching, learning, research and service. The IT Department actively engages the teaching and learning processes by introducing multimedia solutions and mobile technologies, creating smart classroom environment, and supporting effective utilization of the learning management system. The IT Department also supports administrative divisions in adopting technologies that improve users' productivity in executing University functions, and manages all University information systems. Additionally, the IT Department is responsible for maintaining, and upgrading all hardware, software and applications dedicated to running University academic and administrative functions. IT Department also engages in infrastructure planning and maintenance and in supervising related projects.

Operation and Network Services

The IT Department runs a state-of-the-art Data Center that houses the computers and related telecommunications and storage systems including latest generation servers, Virtual Desktop Infrastructure, Storage Area Networking, and Intrusion Prevention System. The center operates redundant power sources, redundant data communications connections, and security devices.

The center includes a large number of servers that provide all students, faculty, and staff the storage space and privileged access to network-based data, software resources, and Internet and e-mail services.

The network serves all students, faculty, and staff. It covers over nine buildings of classrooms, offices, student and faculty dorms. The Gigabit Ethernet fiber-optic backbone network is connected to the Internet through a 150 Mb/s line to provide the necessary bandwidth for quality services. The network consists of over 840 voice/data points and includes more than 40 wireless access points covering all university buildings. At present, nearly 400 computers are connected to the University network.

Management Information System (MIS)

The Management Information Systems (MIS) Section includes a highly competent team that manages the University Information Systems. The MIS is responsible for developing, administrating, supporting and providing service management for the University Enterprise Resource Planning (ERP) including: Student Information System (CampusVue), student accounting, finance, payroll, human resources systems, library and archiving systems, staff work log system and ID card system. Furthermore, the MIS manages information flow and generates reports to various University divisions for planning and decision making purposes.

University Website

RHU website is an important communication tool for the University and the source of vital information for prospective and current students, as well as faculty and staff, among other audiences.

Management of the website through a full responsive content management system (CMS), led by the system administrator, strives to ensure that all the information is accurate and easily accessible.

The website provides the users with all available online services including: Student Information System, Moodle, Online Payment System, Surveys and Voting, Alumni Section, Latest Press Releases, Events and News, Careers, Downloadable Applications and much more.

Instructional and Classroom Technologies

A team of dedicated specialists ensures that technology-aided teaching and learning needs of faculty and students are met. The team maintains the multimedia assets in more than 32 classrooms, and supports smart classrooms. The team manages the Moodle – Learning Management System (LMS) - which provides the platform through which faculty, and students actively engage the course material and improve students' potential of attaining expected learning outcomes. New tools are being introduced to simplify the creation of online courses and enable conversion of documents into dynamic objects.

IT Helpdesk Services

The IT Helpdesk team provides a wide range of support services for the students, faculty and staff at RHU in order to ensure that technology aided teaching, learning and administrative processes are running smoothly. These services include but are not limited to: supporting all the IT peripherals (hardware and software) in offices, classrooms and computer labs, users' accounts management, e-mail services, internet and Wi-Fi services, file sharing management, surveillance cameras management, access control management, ID cards printing, etc.

The Helpdesk team utilizes the Ticket Management System "TMS" as their main communication channel with RHU faculty and staff members. TMS provides a transparent and interactive platform for staff and faculty members to send their requests and report incidents, and to follow up and keep record of their tickets. Also, TMS provides a space for end users to provide satisfaction feedback on the service they are receiving from ITC personnel in each ticket.

QUALITY ASSURANCE AND INSTITUTIONAL ADVANCEMENT

Ms. Mirna Talhouk, Assistant Director
Block E
Phone: (961) 5 603090, Ext. 443
E-mail: qaia@rhu.edu.lb
www.rhu.edu.lb/qaia

The Quality Assurance and Institutional Advancement (QAIA) unit was established in 2014 to collect and analyze vital institutional data and to develop and implement quality assurance policies and procedures. The aim of the unit is to improve institutional effectiveness, facilitate continuous improvement, support shared decision making, and assure attainment of aspired excellence in all areas of the university. The QAIA unit is responsible for the following duties:

- Act as a repository of all official institutional documents and statistics;
- Design surveys, focus groups, assessment tools to collect and analyze institutional data;
- Issue reports to the University administrators;
- Maintain a database about competitor institutions;
- Prepare and maintain the University portfolio of programs by developing and implementing an institutional database for Rafik Hariri University that will integrate data from all sources of information in all colleges of the university;
- Harmonize the institutional effectiveness activities to ensure that all academic and administrative units achieve their outcomes and ensure consistency in all campus locations;
- Identify gaps in data collection, analysis and utilization and establish procedures to maintain quality of data;
- Ensure proper use of knowledge and internal / external assessment data;
- Design and update the evaluation and assessment methods appropriate for each category of programs and verify all development plans;
- Support academic units in accreditation efforts;
- Conduct periodic audit to monitor performance and improve related practices.

STUDENT AFFAIRS

Mrs. Sahar Hallak, Student Affairs Coordinator
Block E
Phone: (961) 5 603090 Ext. 770/777
Email: Dso@rhu.edu.lb
www.rhu.edu.lb/studentaffairs

The Student Affairs Office is responsible for many functions that serve to support the nonacademic aspects of University life that improve students' potential of academic success and help them attain a meaningful holistic experience. The Office manages student clubs and societies, promotes athletic and creative activities, organizes cultural events, oversees housing facilities, provides counseling services, holds student elections and organizes student orientation programs, in addition to the handling of the Work Study and the Financial Aid Programs. A brief overview of the various functions and services is presented in the following.

Cultural, Social and Artistic Activities

RHU provides a supportive environment that encourages and enables students to actively participate in extracurricular activities. The Student Affairs Office works closely with student clubs, societies and councils to enrich students' life outside the classroom. By organizing a wide spectrum of athletic, cultural, social, artistic and theatrical activities and events that are physically, psychologically and socially constructive, students are able to advance a cause and practice a hobby they are passionate about. In doing so, students have the opportunity to connect with like-minded peers, build friendships and develop leadership skills.

Counseling and Coaching

The Student Affairs Office aims to create conditions that promote students' social and psychological comfort essentials to achieve academic success. The Student Affairs Office supports students in overcoming obstacles and challenges they encounter during their university experience. The office organizes seminars and workshops to promote student awareness and help them develop skills in coping with social, psychological and emotional difficulties and challenges. The office also provides one-to-one counseling to help a student deal with personal issues and anxieties and make appropriate choices and

decisions. For more information please contact us at: Dso@rhu.edu.lb or 05/603090, Ext: 777.

Student Housing

There are two separate dormitories at Rafik Hariri University, one for the female students and the other for the male students.

The employees working in the students' dormitory yearn to offer comfortable, safe housing experience to international students and local residents who study away from home. Each dorm features a social sit-in area, a study room with computers connected to the internet and library resources, and a broadband WiFi coverage. A bus shuttle runs to and from Damour's highway serving students who wish to spend time off campus. The University is keen to making the living experience on campus an opportunity to strengthen ties and build lifelong friendships among all students. The Dean of Students Office organizes sports, cultural and social events exclusive for students living on campus. For more information on housing services please contact us at: atmehns@rhu.edu.lb or 05/603090, Ext: 741.

Athletics and Recreation

The indoor sports center and outdoor tennis, football and basketball courts at RHU provide ample opportunities for students, faculty and staff to participate in their favorite sports, hobbies and training needs. A team of specialists organizes athletic activities and tournaments to engage students and help them develop skills in the sports they are passionate about. Varsity teams are formed and supported to participate in local and international competitions. For more information please contact Coach Khaled Baba at: babakk@rhu.edu.lb or 05/603090, Ext: 330.

The Ushers

This program trains student volunteers and involve them in organizing university sponsored events and conferences, on and off campus. Ushers play a vital role in the success of the open-house activities, graduation ceremony and new-students orientation. Ushers are trained to guide students, parents and guests and make them feel at ease during their visit to the campus. For information contact us at: dso@rhu.edu.lb or 05/603090; Ext: 777.

Transportation

There are free bus shuttles that transport students from the dormitory to Damour's highway. Shuttle bus services are available to transport students to the RHU campus from and to several areas in Lebanon.

The buses run the routes several times per day. For more information about the bus schedule, please contact the Student Affairs Office sao@rhu.edu.lb or 05/603090, Ext: 777.

Student Centers

There are student lounges to relax and enjoy activities such as pool, chess, ping pong and other entertainment. Each dorm also has two common rooms, one for social gathering and the other for studies.

Food Services

The cafeteria at Rafik Hariri University serves a variety of traditional and international cuisines at reasonable prices during the day and through the evening hours. RHU also has ample and comfortable sit in areas to enjoy your meal in the picturesque natural outdoors. Vending machines offering snacks and drinks are placed in various university buildings.

Health Care

The University Medical Clinic has a resident nurse that provides RHU students, faculty and staff preliminary healthcare services around the clock. The clinic is located in Block "I" next to the bookstore. Ambulance services are also available around the clock in case a situation needs attention beyond the clinic's available resources.

Student Rights and Responsibilities

Rafik Hariri University (RHU) pledges to students ***the right to***:

- be challenged to enrich the capacity for critical judgment;
- receive support in pursuit of answers and meanings;
- study in an inspiring and supportive learning environment;

- receive proper academic advising and mentoring;
- be treated with dignity and respect by all;
- receive a clear and informative course outline at the start of the semester and be informed of any modifications thereafter;
- receive constructive feedback on course work within a reasonable timeframe;
- be assessed on the merits of academic performance without prejudice or other discrimination;
- insure the confidentiality of academic and personal information;
- access all information and documents;
- express opinion and convey grievances without fear of retribution; and
- protest violation of rights, appeal judgment deemed unfair and receive and understand related decisions;

And expects students to accept ***the responsibility to***:

- understand, comply and safeguard the University by laws and student code of conduct;
- set a purpose and drive to achieve it;
- study hard to learn and commit to forever learning;
- know program study plan and graduation requirements;
- follow course outline, attend all classes, and accomplish course requirements timely and honorably;
- respect and adhere to established University deadlines;
- be courteous, respectful of diversity, and tolerant to others' beliefs and concerns;
- express concerns and grievances within the confines of civility;
- follow due process and react with reason in the face of conflict;
- protect University property and preserve campus beauty;
- embrace sustainable practices and use natural resources wisely; and
- represent the University with honor and professionalism.

Expected Conduct

Students are expected to behave morally, act responsibly and work diligently to advance their lives and that of their communities. In doing so they will:

1. Work hard and intently engage the educational experience.
2. Speak out in a respectful manner and feel free to propose initiatives to improve the university experience.
3. Refrain from smoking except in designated spaces.
4. Help maintain the cleanliness and beauty of the premises.
5. Place trash and recyclable items in designated receptacles.
6. Protect University facilities that are built for their own benefit.
7. Never cheat or claim credit for work that is not their own.
8. Respect diversity and be tolerant of all points of view that are different from their own.
9. Understand the rights and responsibilities and appreciate the premise on which they are founded.
10. Adhere to the university bylaws and policies and assist in implementing them.

RESEARCH

In line with its mission, RHU aims to create the conditions that promote quality research with the potential to advance knowledge and improve human conditions. Upon the recommendation of the Vice President for Academic Affairs (VPAA), the President appoints a graduate studies and research coordinator (GSRC) to ensure the achievement of that aim. The GRSC while working closely with academic units shall coordinate graduate studies and research efforts, follow up on graduate students' progress and needs, identify and seek both internal and external multidisciplinary collaborative research routes, manage the evaluation of the research proposals submitted by faculty members for University and external funding, tap external funding opportunities, and assist the VPAA in articulating and enforcing graduate studies and research policies.

COLLEGE OF BUSINESS ADMINISTRATION

COLLEGE OF BUSINESS ADMINISTRATION

Officers of the College

Ahmad Smaili	President
Ahmad Smaili	Acting Vice President for Academic Affairs
Jamil Hammoud	Dean

Contact Information

Ms. Lydia Hyder
Administrative Assistant
Building G, Room 101-G
Phone: 961 05 603090, Ext. 301
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History and Overview

Being the first and oldest college of the University, The College of Business Administration (CBA) at Rafik Hariri University was established in 1999. Since then, the College has grown significantly and presently offers seven undergraduate business programs in Accounting, Business Computing, Finance and Banking, Human Resources Management, Management, Marketing, Marketing and Advertising. In addition, the College offers a graduate MBA program in general business. Moreover, the CBA takes pride in being the first in Lebanon and the Arab World to offer a graduate MBA program with specialization in Oil and Gas Management.

The faculty is active in applied research in a number of business and related areas, with a focus on seeking solutions for actual community problems and issues. To that extent and in partnership with governmental entities, civil society, trade associations and the private sector, the College is actively engaged into ongoing outreach activities and initiatives designed to support community development and prosperity.

Finally, the CBA distinguishes itself by its systematic Co-op program which allows its students to gain real world working experiences, and its Community Engagement Experience program which enables the students to develop leadership skills via actual community service.

Vision

The College of Business Administration aims to become a premier innovative institution of business education in the region.

Mission

The College of Business Administration aspires to transform the lives of students through graduate and undergraduate business education, contribute to the advancement of knowledge through applied research, and makes a positive impact on society's pursuit of development and prosperity.

We aim to foster an educational culture and environment of innovation and collaboration which enables the development of leaders and professionals, capable and willing to become agents of principled, ethical and socially responsible human progress.

The College undertakes its mission in the context of a higher education philosophy that emphasizes proficient technical know-how in a specialization area, reinforced by core knowledge of main business functional areas, and grounded in the general fundamentals of liberal arts education.

Core Values

The College of Business Administration is committed to maintaining a system of norms, behaviors and conduct well-grounded in the following main guiding values:

Academic Freedom of Inquiry

Faculty and students are free to pursue knowledge and learning so long as such pursuits do not breach University and College missions, policies and regulations.

Excellence through Innovation

The College has an unwavering commitment to the pursuit of excellence in everything we do. Key to this pursuit is our innovative initiatives, ideas and efforts.

Ethical and Socially Responsible Conduct

The College exercises all efforts possible to ensure the awareness and practice of ethical and socially responsible norms.

Tolerance and Diversity

The College is committed to highlight and raise awareness of tolerant mentalities which accept and respect differences with others. Moreover, the College recognizes and promotes the enrichment that results from the diversity of individuals, communities, ideas and perspectives.

Personal Initiative and Individual Responsibility

Leaders and professionals have the courage to initiate and take responsibility for their choices. The College promotes this principle and encourages its stakeholders to learn and act in accordance with it.

Teamwork, collaboration and cooperation

The College is committed to conduct its affairs in the spirit of teamwork and collaboration. Furthermore, the College opens up opportunities for students to learn and appreciate the value of collective work.

Continuous Improvement and Innovation

The College regards continuous improvement and innovation in its programs and scholarship as necessary to meet the challenges of rapidly changing business environments

College Learning Goals

Conforming to the College's mission statement, we aim to transform the lives of our students through graduate and undergraduate business education; the College's Learning Objectives specify the expected resulting outcome of this transformation as graduates capable of becoming agents of human progress.

Accordingly, the general learning objective of the College is to equip its students with the values, knowledge, competencies and skills needed to produce a positive impact in whatever they do in life. In particular, these values, knowledge, competencies and skills are as follows:

General and Specialized Knowledge

Knowledge of main business functional areas	Students will acquire basic and fundamental knowledge of main business functional areas, necessary for them to

(CLG1)	understand the general business environment and its interrelationships.
Specialized knowledge (CLG2)	Students will become proficient in up-to-date theories, applications, best practices and other dimensions of their chosen area of specialization, including hands-on applications.

Employability

Effective communication (CLG3)	Students will acquire abilities to effectively communicate orally and in writing in various professional environments and settings.
Working knowledge of IT (CLG4)	Student competencies will be enabled by the development of a working knowledge of information technologies adequate to meet the challenges of the information technology and telecommunication revolution.

Critical Thinking and Social Responsibility

Analysis and critical thinking (CLG5)	Programs and activities in the College will involve learning settings which require students to learn and practice analytical and critical thinking tools and methods.
Ethics and social responsibility (CLG6)	The college will ensure that its students are exposed to learning opportunities which would allow them to improve their recognition and awareness of ethical dilemmas and socially responsible behaviors.

Growth Potential

Pursuit of growth opportunities (CLG7)	Teaching and activities in the College shall promote knowledge and competencies which would allow students to seek further development opportunities

MBA PROGRAM

Program Overview

The Master of Business Administration (MBA) program at the College of Business Administration (CBA) is a graduate studies program, carefully crafted and continuously reviewed and updated, to allow students interested in advanced studies, to pursue their ambitions, within the framework of adding value to the betterment of society and humanity.

The program blends contemporary theories with real world applications and best practices, in the context of international standards and expectations. Accordingly, teaching methods and approaches emphasize the case method, learning by doing, and thoughtful integration of online and information technologies

Moreover, the program's breadth and depth is designed to insure that graduates may join the business world upon graduation, or go on to pursue more advanced academic and/or applied studies.

Mission

The MBA program's mission is to create a sustainable learning environment conducive to developing professional managerial leaders, able and willing to add economic and social value to society and humanity, in whatever contexts they live or serve.

Specialization Options

Students admitted into the MBA Program may choose their emphasis to be: General Business Management or Oil and Gas Management. An undergraduate degree in business is not necessary to pursue studies in either of the two emphasis areas, as background and/or remedial courses could be given to compensate for possible lack of fundamental business knowledge, in accordance with the admission requirements specified below.

General Business Management: Student Learning Goals and Outcomes

Managerial Dimension

Goal 1: Demonstrate knowledge of contemporary and modern strategic planning and management

Outcome 1: Use strategic management tools such as SWOT to evaluate the strategic position of a business organization.

Professional Dimension

Goal 2: Demonstrate ability to tackle business problems and skills to effectively communicate business information

Outcome 2: Apply problem solving tools to various business situations

Outcome 3: Prepare and deliver presentations, projects and research reports

Economic Value Dimension

Goal 3: Demonstrate ability to integrate aspects from various functional domains of business to arrive at plausible solutions.

Outcome 4: Identify and assess the various functional aspects of a business case or situation, and propose appropriate solutions

Social Value Dimension

Goal 4: Demonstrate awareness of the necessity to contribute to the betterment of society.

Outcome 5: Reflect on how business can contribute to society's wellbeing.

Oil and Gas Management: Student Learning Goals and Outcomes

Managerial Dimension

Goal 1: Demonstrate knowledge of contemporary and modern strategic planning and management, especially as they related to the petroleum industry

Outcome 1: Use strategic management tools such as SWOT to evaluate the strategic position of a business organization, with emphasis on the petroleum industry

Professional Dimension

Goal 2: Demonstrate ability to tackle petroleum industry business problems and skills to effectively communicate business information

Outcome 2: Apply problem solving tools to various business situations pertaining to the petroleum industry

Outcome 3: Prepare and deliver presentations, projects and research reports

Economic Value Dimension

Goal 3: Demonstrate ability to integrate aspects from various functional domains of business to arrive at plausible solutions for petroleum industry problems

Outcome 4: Identify and assess the various functional aspects of a business case or situation, and propose appropriate solutions

Social Value Dimension

Goal 4: Demonstrate awareness of the necessity to contribute to the betterment of society.

Outcome 5: Reflect on how business can contribute to society's wellbeing.

Admission Requirements

All applicants to the MBA program must first satisfy the university graduate admission requirements specified in in this bulletin in.

Regular Admission

Applicants who have a Bachelor of Business Administration degree or its equivalent in any business area and satisfy the university graduate admission requirements for regular admission will be granted a regular admission status into the MBA program, and will be exempt from any background and/or remedial courses.

Admission on Probation

Applicants admitted on probation into either one of the two emphasis options may have to take up to three background and/or remedial courses, in addition to the MBA program requirements, to solidify their chances of successful completion of the MBA program. The number and nature of background and/or remedial courses are determined by the College's graduate admission committee on a case by case basis, depending on the strength of the applicant's file, professional work experience and undergraduate transcript.

Admission for Students with non-Business Undergraduate Degrees

Applicants with undergraduate degrees in areas other than business may have to take up to five background and/or remedial courses, in addition to the MBA program requirements, to ensure that they have the necessary business foundational knowledge for successful completion of the MBA program.

In general, the five courses include one foundational course in each area of Accounting, Finance, Economics, Management/Marketing, and Quantitative Methods. The number and nature of background and/or remedial courses are determined by the College's

graduate admission committee on a case by case basis, depending on the strength of the applicant's file, professional work experience, and undergraduate transcript.

Graduation Requirements

In addition to the University requirements stipulated in the general section of this catalog, the following graduation condition must also be met before an MBA is granted: A student cannot graduate if he/she has more than two courses in which a grade less than 80 were attained.

Program Requirements

MBA program requirements consist of mandatory core business knowledge courses (18/21 credits), elective specialization courses (12/15 credits) and an MBA capstone research project (3 credits). Moreover, students majoring in oil and gas management are required to complete a practicum of 1 to 2 month practical training period at various petroleum industry companies and organizations. All in all, students are required to successfully complete 36 credits to graduate. The mandatory Core Business Knowledge Courses (18/21 Credits) are listed below:

Course	Title	Credits
BADM 505	Business Research Methods	3
BADM 515	Quantitative Modeling for Business	3
BECN 500	Applied Business Economics	3
BFIN 520	Corporate Financial Planning	3
BMGT 500	Strategic Planning and Business Policy	3
BMKT 510	Strategic Marketing Management	3
In addition to the above six mandatory courses, students on the General Business Management track must take BACC 500 - Managerial Accounting, and students on the Oil and Gas Management track must take BACC 505 - Accounting for Oil and Gas.		

MBA Research Project

Students in any of the MBA programs are expected to complete their MBA studies by successfully completing a capstone research project. The topic of the project is selected by the students and the project advisor and expected to involve research on a pertinent contemporary issue. The student must present his/her work in a formal report.

Study Plans

MBA: General Business Management

Course	Title	Credits
Year 1, Fall Semester (9 Credits)		
BECN 500	Applied Business Economics	3
BADM 505	Business Research Methods	3
	Business Management Elective	3
Year 1, Spring Semester (9 Credits)		
BFIN 500	Corporate Financial Planning	3
BACC 500	Managerial Accounting	3
	Business Management Elective	3
Year 2, Fall Semester (9 Credits)		
BADM 515	Quantitative Modeling for Business	3
BMGT 500	Strategic Planning and Business Policy	3
	Business Management Elective	3
Year 2, Spring Semester (9 Credits)		
BMKT 510	Strategic Marketing Management	3
BADM 590	MBA Research Project	3
	Business Management Elective	3

MBA: Oil and Gas Management

Year 1, Fall Semester (9 Credits)		
BECN 500	Applied Business Economics	3
BADM 505	Business Research Methods	3
BMGT 530	Overview of the Global Oil and Gas Industry	3
Year 1, Spring Semester (9 Credits)		
BFIN 500	Corporate Financial Planning	3
BACC 505	Accounting for Oil and Gas	3
BECN 525	Energy Policy and Economics	3
Year 1, Summer (0 Credits)		
BADM 585	Practicum	0
Year 2, Fall Semester (9 Credits)		
BADM 515	Quantitative Modeling for Business	3
BMGT 500	Strategic Planning and Business Policy	3

BMGT 510	Advanced Project Management	3
Year 2, Spring Semester (9 Credits)		
BMKT 510	Strategic Marketing Management	3
BADM 530	Oil and Gas Law, Contracts and Negotiations	3
BADM 595	MBA Research Project in Oil and Gas Management	3

Courses Descriptions

Descriptions of these courses are given below:

BACC 500	**Managerial Accounting**	**3(3,0)**
This course investigates the important role accounting systems and information play in the management, planning, control and decision making of businesses. Topics include cost concepts, behavior and estimation; theory of constraints; cost-volume-profit analysis; activity based costing, capital budgeting and profit planning.		

BADM 505	**Business Research Methods**	**3(3,0)**
This course is about using business research to support business and management decisions or pursue more advanced graduate studies in business. It covers mainly the development, implementation, analysis and reporting of a research proposal. While the course covers qualitative research, it places emphasis on quantitative research in general and surveys in particular.		

BADM 515	**Quantitative Modeling for Business**	**3(3,0)**
This course introduces students to the use of management science to support the business decision making process. The focus is on quantitative tools and techniques that are used to facilitate decision making such as linear programming, transporting problems, project management, inventory models, waiting line modes, decision analysis, and forecasting.		
BECN 500	**Applied Business Economics**	**3(3,0)**
Business Economics combines microeconomic tools with management methods for the purpose of effective decision making. It mainly covers quantitative demand analysis, optimization, consumer behavior, production, cost analysis, market structures and pricing.		

BFIN 520	Corporate Financial Planning	3(3,0)
This course exposes students to the financial management of the firm for the purpose of value maximization. That includes capital budgeting, capital structure and working capital management. The course starts with an intensive review of main corporate finance principles, followed by advanced level coverage of capital budgeting, capital structure and leverage, dividend policy, long term debt, financial forecasting and working capital policy.		

BMGT 500	Strategic Planning and Business Policy	3(3,0)
This course offers students deep insight into the strategic management process and its influence on the competitive advantage of an organization. Students will develop a comprehensive management viewpoint that integrates their knowledge of specific business functions and enables them to formulate and implement strategy. The course covers topics like vision, mission and objectives, environmental analysis, strategy formulation, implementation, and evaluation.		

BMKT 510	Strategic Marketing Management	3(3,0)
This course is an immersion in the core principles and practices of successful marketing plans and strategies. Topics include creating a marketing strategy in the context of overall business strategy, exploring the marketing mix, competitive dynamics, value pricing and integrating digital, brand and business strategies. The course places emphasis on customer relationship management and turning Big Data into value and profits.		

BACC 505	Accounting for Oil and Gas	3(3,0)
This course covers the fundamentals of oil and gas accounting. Topics include non-drilling exploration costs, drilling and development costs, proved and unproved property costs, asset retirement and asset impairment, oil and gas revenue accounting, oil and gas taxation and oil and gas disclosures.		

Elective Courses - General Business Management Program (12 credits)

Students in the general business management program elect four specialization courses, in addition to the mandatory core business knowledge requirements detailed above. Below are a number of elective specialization courses to choose from, along with their descriptions.

BECN 505	Globalization and International Business	3(3,0)
This course offers a thorough conceptual understanding of globalization and its implications on business and economic policy making. In addition to pointing out the challenges and opportunities globalization imparts, the course examines the interconnectedness between globalization and markets, governance, and global business and economic policy.		

BECN 515	Environmental Economics	3(3,0)
This course will focus on the balance between the environment and economic prosperity. Due consideration is given to the efficient and equitable use of environmental resources such as air, water, land, parks and wildlife. The use of such resources is examined from a number of perspectives including the market, efficiency, and equity and government policy.		

BECN 520	Emerging Markets	3(3,0)
The course contributes to the understanding of the trend for transformation towards open market economies while building accountability within the system. This includes the reform of the price system including prices in the labor market, exchange rate regimes, as well as legal reform that cover basically business laws to enhance competitiveness and equal opportunities.		

BFIN 505	Portfolio Theory and Investment Analysis	3(3,0)
This course aims to cover modern portfolio theories and asset allocation models and methods for the purpose of an effective investment decision. It covers investment strategies and management processes, investment short and long term objectives, financial instruments selection and timing, trading practices, performance evaluation, the Capital Asset Pricing Model and the Efficient Market Hypothesis.		

BFIN 510	International Business Finance	3(3,0)
This course covers the environment of international financial management and country risk analysis, foreign exchange and derivatives markets, and FX risk management. It also deals with ways to finance the multinational corporation and manage its working capital. In addition, it covers foreign investment analysis with special emphasis on FDI. The course includes an in-depth review of several contemporary case studies.		

BFIN 515	Commercial Bank Management	3(3,0)
The emphasis of this course is on commercial bank management policy and decision making. Analysis focuses on advanced asset-liability management approaches and addresses banking risk management issues such as interest rate, liquidity, credit, operational and capital adequacy. Topics include, performance, maturity, duration and gap management		

BMGT 505	Contemporary Management and Internal Organization	3(3,0)
This course examines how successful organizations use management to convert strategy into reality. It describes the levels of management, the skills of managers and their functions, and elaborates using, contemporary tracks of management, on the four functions of management with special reference to leadership.		

BMGT 510	Advanced Project Management	3(3,0)
This course is intended to equip graduate students with the ability to manage mega projects in addition to advanced knowledge of the latest techniques used in various areas of project management including project selection and planning, cost estimation and pricing, contracts and procurement, scheduling and resource management. PMI standards will serve as a point of reference in instruction. Real project casework will be provided and used for teaching and demonstration.		

BMGT 520	Corporate Governance	3(3,0)
This course deals with the optimization of economic results as viewed by the processes of corporate governance. Corporate governances is the way in which a corporation is directed, administered, and controlled. The balance of power between the corporation and its environment (the stake holders) is well studied in this course.		

BMGT 525	Entrepreneurship and Investment Capital	3(3,0)
Great business ideas will remain ideas unless the proper resources are allocated to transform it into business reality. This course discusses how business opportunities are created by matching entrepreneurs with capital. Students will look at how venture capitalists evaluate, value, and structure new entrepreneurial investments. Another aspect of this course is how venture capitalists manage their funds.		

BMGT 535	Ethics and Social Responsibility	3(3,0)
The purpose of this course is to enable students to make ethical decisions in business by providing them with a framework that they can use to identify, analyze, and resolve ethical issues in business decision making. In addition, social responsibility is an important part of a firm's business strategy. Issues such as the balance between business benefits and social benefits, the role of sustainability in business strategy; and the importance of stakeholder relationships will be discussed.		

BMGT 540	Organizational Leadership and Behavior	3(3,0)
This course provides a comprehensive analysis of individual and group behavior in organizations with emphasis on leadership. Its purpose is to provide an understanding of how organizations can be managed more effectively while enhancing the quality of employees work life. Topics include motivation, rewarding behavior, stress, individual and group behavior, conflict, power and politics, decision-making, communication and organizational change and development.		

BMGT 545	Operations and Supply Chain Management	3(3,0)
This course teaches students how to manage the operations related to the creation and distribution of goods and services, increasingly taking place outside the boundaries of traditional enterprise setting. This study includes analyzing processes, ensuring quality, creating value, and managing the flow of information, products and services across a network of customers, enterprises and supply chain partners.		

BMKT 515	Branding and Franchising	3(3,0)
Students will learn to develop a brand strategy, how to analyze and evaluate brands and manage them for maximum effectiveness. The course also examines brand planning, brand equity, brand architecture, and the different brand strategies. Franchise management issues and how to maintain and strengthen brand identity through franchising will also be analyzed.		

BMKT 520	Digital Marketing	3(3,0)
Digital marketing has evolved from a peripheral element of organizational marketing to one that is the hub of customer-centric communications in an increasingly multi-channel environment. This course explains the principles of digital marketing together with the major factors involved with implementation, measurement, and evaluation of successful campaigns that utilize digital marketing channels.		

BADM 580	Graduate Independent Studies in Business	3(3,0)
This course is designed to allow students to pursue further knowledge and competence in emerging business topics and issues, on an independent research basis, under the supervision of a full time faculty member. Specific Issues, topics and requirements will be agreed upon between the student and the faculty supervisor.		

Elective Courses - Oil and Gas Management Program (12 Credits)

Students enrolled in the oil and gas management program are required to take the four specialization courses listed below along with their descriptions, in addition to the mandatory core business knowledge courses.

BADM 530	Oil and Gas Law, Contracts and Negotiations	3(3,0)
This course presents coverage of the legal rules that govern the development of privately owned mineral rights, which often also apply to government-owned resources. It covers aspects such as the nature, protection, and conveyance of oil and gas rights, leasing, and taxation. In addition the course covers the structure and different types of oil and gas contracts.		

BECN 525	Energy Policy and Economics	3(3,0)
This course covers the economics of various energy resources with emphasis on oil and gas. Students will be exposed to how market mechanisms shape and influence the demand for and the supply of energy. Moreover, the course examines energy cost structures and analyzes the relationship between energy consumption and the performance of the macro economy and economic growth.		

BMGT 510	Advanced Project Management	3(3,0)
This course is intended to equip graduate students with the ability to manage mega projects in addition to advanced knowledge of the latest techniques used in various areas of project management including project selection and planning, cost estimation and pricing, contracts and procurement, scheduling and resource management. PMI standards will serve as a point of reference in instruction. Real project casework will be provided and used for teaching and demonstration.		

BMGT 530	Overview of the Global Oil and Gas Industry	3(3,0)
This course presents a descriptive and analytical overview of the business of oil and gas. It addresses a wide range of topics organized around the oil and gas industry value chain, starting with exploration and ending with products sold to consumers. Topics		

include issues related to upstream, midstream and downstream aspects such as exploration, development, production, transportation, trading, refining and marketing.

MBA Research Project

Students in the MBA program with emphasis in General Business Administration are expected to complete their MBA studies by successfully completing a capstone research project, as described below.

BADM 590	**MBA Research Project**	**3(3,0)**
The MBA Research Project is a self-directed study undertaken by the student, under close supervision of a faculty member. The project is a capstone experience in the sense that it integrates together knowledge from various business areas, as part of complete research process designed to address a business issue agreed upon between the student and the faculty supervisor.		

By contrast, students in the MBA program with emphasis in Oil and Gas Management are expected to complete their MBA studies by successfully completing an oil and gas capstone research project, as described below.

BADM 595	**Oil and Gas Research Project**	**3(3,0)**
The Oil and Gas Research Project is a self-directed study undertaken by the student, under close supervision of a faculty member. The project is an oil and gas capstone experience in the sense that it integrates together knowledge from various areas, as part of complete research process designed to address an oil and gas issue of interest agreed upon between the student and the faculty supervisor.		

MBA Oil and Gas Practicum

Students enrolled in the Oil and Gas Management program are required to successfully complete a practical training practicum as described below.

BADM 585	**Oil and Gas Practicum**	**0(0,3)**
The Oil and Gas Practicum is a period of 1-2 month practical training performed at petroleum industry companies, for the purpose of enabling the student to gain firsthand experience in the business of oil and gas and develop a practical appreciation of the industry in general.		

Faculty List

Akoum, Rima; Instructor, Master of Business Law, Lebanese University, Beirut, Lebanon, 2014

Ayass, Arfan; Instructor, MS in Accounting, University of South Carolina, USA, 1969.

Bizri, Rima; Assistant Professor and Chair, Ph.D in Risk Management in Islamic Finance, Imam Ouzai University, Beirut, Lebanon, 2014.

Chaya, Jamil; Assistant Professor, Ph.D. in Money and Finance, University of Rome Tor Vergata, Rome, Italy, 2015.

Ghazzawi, Fouad; Instructor, MBA in Accounting & Finance, Lindenwood University, Saint Charles, MO., USA, 2008

Hajjar, Faysal; Instructor, MS in Finance; Saint Joseph University, Lebanon, 2005.

Hakim, Rima; Senior Lecturer, M.S., CMA in Business Management, Beirut University College (BUC), Beirut, Lebanon, 1993.

Hammoud, Jamil; Associate Professor and Dean, Ph.D. in Economics, Ecole des Hautes Etudes en Sciences Sociales (EHESS), Paris, France, 2003.

Jardali, Houssein; Lecturer, PH.D. in Business Administration, Lebanese University, Beirut, Lebanon, 2016

Mansour, Samar Khayat; Instructor, MA in Economics, American University of Beirut, Lebanon, 2001.

Moghrabi, Ragheed; Lecturer, MA in Financial Economics, Northeastern University, Boston, USA, 1996.

Mozahem, Najib; Assistant Professor, Ph.D. in Organizational Theory, Durham Business School, Durham, England, 2015.

Rahal, Bassim; Instructor, MBA in Finance, Lebanese American University, Lebanon, 1999.

Saheb, Adel; Instructor, MS in Construction Management, University of Pittsburg, USA, 1987

Tarabay Mohamad, Assistant Professor, DBA in Finance, Grenoble School of Management, Grenoble, France, 2010.

Wahbi, Marwan; Assistant Professor, DBA in Marketing, Grenoble School of Management, Grenoble, France, 2017

Zoughaib, Mona; Lecturer; Ph.D. in Management Science, University of Paris V, Descartes, France, 2009.

COLLEGE OF ENGINEERING

COLLEGE OF ENGINEERING

Officers of the College

Ahmad Smaili	President
Ahmad Smaili	Acting Vice President for Academic Affairs
Hisham Basha	Dean

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History

The College of Engineering at Rafik Hariri University (RHU) was established in 1999. Since then, the College has grown significantly and presently offers six undergraduate engineering programs in Biomedical, Civil, Computer and Communications, Electrical, Mechanical, Mechatronics Engineering. Fully accredited by the Lebanese Ministry of higher education, the college is working with each department towards accreditation by the Engineering Accreditation Commission of ABET – the most prestigious accrediting agency worldwide.

The College also features active research programs in a number of engineering areas. In this regard, Master Degree's programs in all six programs are available. For those students who are employed and can only be present on campus in the afternoons, a non-thesis Master's degree option is also available. More than 400 students are currently enrolled in the undergraduate and graduate programs.

Overview

The College of Engineering at RHU was established in order to fill a perceived gap that existed in high-caliber, yet affordable, higher education in technology and associated fields. The college strives to apply learning methodologies that can transform entrant

students into 21-century leaders in their respective fields. Furthermore, the college stresses the important balance between knowledge-skills and application. To the latter's effect, specialized Labs, modern class rooms, and a unique Co-op experience are implemented.

Vision

The College of Engineering aspires to be a center of excellence in engineering education and an incubational environment for innovation that serves Lebanon, the region and worldwide.

Mission

The College of Engineering's mission is to provide quality professional education in a learning environment conducive to transformation that will enable our students to effectively innovate practical solutions to society's problems and individual needs in Lebanon, the Middle East and the world.

Goals

We strive to achieve our mission. To this end, we are committed to ever-revise our programs while keeping our senses tuned to our surroundings. More than anything else, our students - their learning and potential success - receive our greatest attention.

Values

The college of Engineering fully endorses the values of RHU of: Academic Freedom of Inquiry, Excellence through Innovation, Ethical and Socially Responsible conduct, Tolerance and Diversity, Personal Initiatives and Individual Responsibility, Teamwork, Collaboration and cooperation, and Continuous Improvement.

Academic Programs

The College of Engineering offers six programs leading to a Master of Science Degree (MS).

1. Master of Science in Civil Engineering
2. Master of Science in Electrical Engineering

3. Master of Science in Computer and Communications Engineering
4. Master of Science in Biomedical Engineering
5. Master of Science in Mechanical Engineering
6. Master of Science in Mechatronics Engineering

Program Codes

The following table lists the code used for each program. This code is used as the prefix of each course designation in the program.

Program Code	Program
CIVE	Civil Engineering
BIOM	Biomedical Engineering
CCEE	Computer and Communications Engineering
ELEC	Electrical and Electronics Engineering
MECH	Mechanical Engineering
MECA	Mechatronics Engineering

Admission Requirements

All applicants to the MS program must first satisfy the university graduate admission requirements specified in in this catalog.

Regular Admission

Applicants who satisfy the university graduate admission requirements for regular admission will be granted regular admission status into one of the six graduate programs, and will be exempted from any background and/or remedial courses.

Admission on Probation

Applicants admitted on probation may be required to take background and/or remedial courses, in addition to the graduate program requirements, in order to treat any deficiencies in their background. The number and nature of background and/or remedial courses are determined by the College's graduate admission committee on a case-by-case basis, depending on the strength of the applicant's file, professional work experience and undergraduate transcript.

Admission of Students with non-engineering Undergraduate Degrees

Applicants with undergraduate degrees in areas other than Engineering may have to take bridging courses, in addition to the graduate program requirements, to ensure that they have the necessary Engineering foundational knowledge for successful completion of the graduate program they want to join. The number and nature of background and/or remedial courses are determined by the College's graduate admission committee on a case-by-case basis, depending on the strength of the applicant's file, professional work experience, and undergraduate transcript.

Degree Requirements

To earn a MS degree in engineering students must complete a set number of credits, depending on the undergraduate earned degree as summarized in the following table.

Minimum MS degree Requirements			
Undergraduate studies		MS Degree Credits Requirements	
Degree	Credits Earned	Thesis Option	Non-Thesis Option
Bachelor of Science Degree	114 Credits	48 Credits	51 Credits
Bachelor of Engineering Degree	147 Credits	15 Credits	18 Credits

These requirements are applicable to RHU graduates with a BS or a BE degree in Engineering and to non-RHU graduates whose undergraduate degrees cover at least the same number of RHU transferable credit hours. Others may be required to take additional graduate courses.

Note: Holders of a BS degree must first complete the requirements of the Last Year of the BE Program as described in the undergraduate catalog.

Graduate Studies Options

Graduate students may pursue one of two options, Thesis option or non-thesis option. The requirements for each option beyond the completion of all BE degree requirements are as follows:

Thesis Track

- Research Methods Course (3 credits)
- 600 level Technical Elective courses (6 credits)
- Thesis work (6 credits)

Non-Thesis Track

- Research Methods Course (3 credits)
- 600 level Technical Elective courses (12 credits)
- Project-based work (3 credits)

Master Project

In partial fulfillment of the requirements for the MS degree (non-thesis option) a student is required to complete a three credits project selected by the students and advisor and approved by the Dean in consultation with the College Council.

Master Thesis

In partial fulfillment of the requirements for the MS degree, a student must submit a thesis based on original, independent research. The thesis must be in English. Thesis timeline and regulations are briefly discussed below. The thesis consists of 6 credits encompassing two parts, Thesis I (3 credits) and Thesis II (3 credits). Student must work closely with his/her thesis advisor so that the thesis is completed during the semester the student registers for Thesis II. In case more time is needed to complete the thesis work, the student may be allowed to register for Thesis II one additional time at no cost. Any registration beyond a second time the student shall be required to pay for the credits.

Timeline

The following tables summarize thesis regulations and completion deadlines.

Table 1 Steps towards Thesis completion

	Date	Form to complete
Orientation	First week of the first semester	
Plan of study	End of first semester	(GS-1)
Thesis committee formation	End of 1st semester	
Thesis proposal	See table 2	(GS-2)

Thesis defense	See table 2	(GS-3)
Thesis copy to Library	See table 2	

Table 2 Deadlines for completing thesis

	To graduate in		
Deadline for	**August**	**December**	**May**
Approval of thesis proposal and committee	Apr 30	Sept 15	Jan 15
Thesis defense	July 15	Dec 15	Apr 30
Deposit of thesis at library	July 25	Dec 24	May 10

Committee

Normally, the thesis advisor is chosen from among the full-time professorial faculty of the department. The thesis advisor and the graduate student must form the thesis committee. The committee shall be composed of: the thesis advisor as chairperson, and at least two other members from RHU academic community. At least two members of the thesis committee must be members of the department to which the student belongs. Committees can include up to four members. The additional member could be from RHU, industry, or from an institution other than RHU. All academic committee members should hold professorial rank. The thesis committee approves the thesis topic and research program and conducts the thesis defense examination. The thesis committee shall be approved by the Dean in consultation with the CGSC.

Proposal

Once the plan of study is approved, the student must submit to the CGSC a proposal approved by the thesis committee and the chairperson of the department at least two weeks before the CGSC meets. The proposal must include: Thesis objectives, Scope of work with relevant literature review, Research methodology, Expected findings, and Expected date of graduation.

The Proposal Cover Page Form (GS-2) must be submitted with the proposal. The CGSC will render a decision on the proposal on the following dates: April 30 for students graduating in August September 15 for students graduating in December January 15 for students graduating in May.

The decision of the CGSC is communicated to the student through his/her thesis advisor.

It is the student's responsibility to keep members of the thesis committee informed of the progress of his/her work and to seek their feedback.

Format

The required thesis format is explained in the Thesis Manual which is available at the Library. The thesis manual provides instructions on the preparation of thesis. Theses not conforming to the requirements of the thesis manual will not be accepted. An abstract not exceeding 350 words must be submitted.

For all matters not discussed in the manual, theses must follow the form and style described in the latest edition of K. L. Turabian, Manual for Writers of Term Papers, Thesis and Dissertations (University of Chicago Press), or any other form specified by the department or program provided this conforms to the manual.

Defense

A graduate student may not have his/her thesis defense until he/she has successfully completed at least 30 credits of the course requirements for the master's degree and secured the permission of the thesis advisor.

A final draft of the thesis must be prepared in consultation with each member of the thesis committee. The final draft of the thesis must be submitted to each member of the thesis committee at least two weeks before the date of the thesis defense.

The thesis defense should take place at least four months after the approval of the proposal by the GC. The deadlines for the thesis defense for students who wish to graduate in August, December, or May are July 15, December 15, and April 30, respectively.

The thesis defense will be open to the public and will be announced at least one week in advance. The total time allocated for the thesis defense should allow for answering all questions and should normally not exceed 90 minutes.

The results of the thesis defense shall be reported on a special form, Form GS-3, signed by the chairperson and members of the thesis committee. This form is communicated by the chairperson of the department to the Registrar with a copy of the plan of study form (GS-1) indicating the graduate courses completed by the student, and the attained grades. In the event that the student fails the thesis defense, the student may resubmit the thesis and defend it after a period of at least three months. Failure on the second attempt results in automatic dismissal from the thesis work.

After successful defense of the thesis, the chairperson of the department recommends to the GC that the student be granted the master’s degree. A student must be registered for Thesis-II in the semester in which he/she is expected to graduate.

Thesis Grade

The Thesis grade is P for Pass and F for Fail. If the Thesis committee deems that the thesis work is exceptional they may recommend the department granting the student a commendation that would reflect the exceptional outcome of his/her work.

Submission of the Thesis to the Library

The student, after passing the thesis defense, must submit two hard and one soft copy of the thesis, complete with abstract and signatures of the members of the thesis committee, to the Library. The receipt of these copies is submitted by the student to the office of the Registrar before the student is awarded the degree.

Study Plans

In the following sections the study plan for each MS program offered in the College of Engineering is presented followed by the descriptions of the associated 600 level courses.

Civil Engineering Program

The following study plan summarizes the courses and credit distribution for the Masters of Science (MS) in Civil Engineering. The following study plan serves as a roadmap for a smooth progression toward graduation.

Course #	Title	Credits	Pre-requisites
ENGR 600	Engineering Research Methods	3	
CIVE 690	Capstone Research Project (non-thesis option)	3	ENGL 217
CIVE 695A	Thesis I (thesis option)	3	Co-req: ENGL 217
CIVE 695B	Thesis II (thesis option)	3	CIVE 695 A
CIVE 6xx	Technical Elective I	3	
CIVE 6xx	Technical Elective II	3	
CIVE 6xx	Technical Elective III (non-thesis option)	3	
CIVE 6xx	Technical Elective IV (non-thesis option)	3	

A. Engineering Research Methods

The research methodology course is mandated by the MEHE. This course must be taken by all MS bound students. However the specific experiences organized around the general topics may be tailored to meet program's need. The description of the Engineering required course is described below.

ENGR 600	**Engineering Research Methods**	**3(3,0)**
This course introduces students to quantitative and qualitative methods for engaging in meaningful research. The student, at the end of the course, will attain skills in research intent and design, methodology and technique, format and presentation, and data management. Throughout the course, the student's ability to use this knowledge to become a more effective researcher will be developed. In particular, the student will be able to develop a hypothesis about a research problem and develop related questions; frame the problem with the correct research methodology; collect data that accurately addresses the research problem; measure the effectiveness of a solution methodology; analyze data to make informed decisions; provide technical documentation of all the phases of a research project; evaluate feasibility of research proposals; and present data to support decisions in front of stakeholders.		

B. Research Project/Thesis

CIVE 690	Capstone Research Project	3(3, 0)
A capstone course requiring group work in one of the emphasis areas offered by the Department. The project is to be carried out under the supervision of a full-time faculty member and culminated in a formal written and oral report (refer to college guidelines related to graduation projects structure and content). **Pre-requisite**: ENGL 217.		

CIVE 695A	Master Thesis I	3(3, 0)
Includes guided review of research literature and/or pilot work relevant to the thesis topic. By the end of this course the candidate for the MS degree should have established a hypothesis, a research methodology and a work schedule for the completion of his/her thesis. A brief oral and written report is expected at the end of the course and should be approved by the research advisor(s). (This course may be repeated only once to accomplish its objective). **Co-requisite:** ENGL 217.		

CIVE 695B	Master Thesis II	3(3, 0)
Continuation of CIVE 695A, Includes the completion and submission of a research thesis, the quality of which is judged acceptable by the jury committee established in accordance with the College of Engineering and Graduate Committee guidelines. (This course may be repeated only once to accomplish its objective). **Pre-requisite:** CIVE 695A.		

C. Elective Courses

As part of the program for the Masters of Science in Civil Engineering, the student is required to take a total of 6 credit hours (12 credit hours for non-thesis option in addition to the 3 credits Capstone Project) of 600 level technical elective courses. These courses allow the student to attain an in-depth knowledge and understanding in a focus area of interest. The student who chooses the non-thesis option can mix and match elective courses from the different areas to acquire broader knowledge of different Civil Engineering disciplines. The thesis option student should select, in coordination with the thesis advisor, the set of electives that best meet the requirements for successful completion of his/her thesis. The CIVE available technical elective courses are distributed in three areas:

1. Structures, Materials and Geotechnical Engineering
2. Water & Environmental Engineering
3. Public Works, Construction Management

It is highly recommended that students take elective courses from the list below after completing the mandatory requirements in the related area. Students may select technical electives from other programs subject to the approval of the thesis committee. The list of recommended technical electives is given below.

Course #	Title	Credits	Pre-requisites
Structures, Materials and Geotechnical			
CIVE 611	Plastic Analysis of Structures	3	CIVE 507
CIVE 612	Advanced Structural Analysis	3	CIVE 507
CIVE 613	Advanced Reinforced Concrete	3	CIVE 415
CIVE 614	Retaining Structures	3	CIVE 424
CIVE 615	Soil and Site Improvement	3	CIVE 424
CIVE 616	Advanced Construction Systems	3	CIVE 415, CIVE 417
CIVE 617	Soil Strength and Slope Stability	3	CIVE 423
Water & Environmental Engineering			
CIVE 672	Environmental Impact Assessment	3	Co-req.: CIVE 538, ENGL 217
CIVE 673	Irrigation and Drainage Engineering	3	CIVE 536
CIVE 674	Environmental Policy and Management	3	CIVE 332
CIVE 675	Hydraulic and Hydrologic Modeling	3	CIVE 536
CIVE 676	Hydraulic Structures	3	CIVE 424, CIVE 536
Public Works & Construction Management			
CIVE 604	Infrastructure Asset Management	3	Senior Standing
CIVE 605	Decision Making and Risk Management	3	MATH 351
CIVE 642	Bridge Engineering	3	CIVE 415, CIVE 424
CIVE 643	Advanced Highway Engineering	3	CIVE 342, CIVE 415
CIVE 644	Airport Engineering	3	CIVE 342

Courses Description

Structures, Materials and Geotechnical

CIVE 611	Plastic Analysis of Structures	3(3,0)
Concept of plastic analysis, plastic hinges, incremental load method (step by step), mechanism method, upper bound, lower bound, and uniqueness theorems, combined mechanisms, beams, multistory, multi-bay and gable frames, computer implementation. **Pre-requisite**: CIVE 507. On demand.		

CIVE 612	Advanced Structural Analysis	3(3,0)
Flexibility and Stiffness matrix methods for analysis of indeterminate trusses, beams, and frames. Grid beams and structures on elastic supports. Composite Structural systems. Influence lines of indeterminate structure utilizing concepts of virtual work and moment distribution methods – Qualitative and Quantitative approaches. **Pre-requisite**: CIVE 507. On demand.		

CIVE 613	Advanced Reinforced Concrete	3(3, 0)
Design of reinforced concrete walls: walls designed as compression members; empirical design method; alternative design of slender walls; shear walls; and pre-cast concrete. Distribution of forces among members, member design, structural integrity, connection and bearing design, strength evaluation of existing structures, reinforced concrete arches. **Pre-requisite:** CIVE 415. On demand.		

CIVE 614	Retaining Structures	3(3, 0)
Lateral earth pressures: at rest, active and passive states, limit equilibrium methods and theory of elasticity, seismic conditions, hydrostatic and seepage pressures. Retaining walls: design of gravity, cantilever, and basement walls. Sheet-piles: cantilever and anchored bulkheads, free- and fixed-earth support methods, moment reduction, and anchorage design. Braced cuts: pressure envelopes, design of sheeting, wale beams and struts, stability against bottom heave or piping. Shoring systems: types, control of groundwater, construction stages, anchors prestressing and testing, ground settlement around excavations. Code requirements, computer applications. **Pre-requisite:** CIVE 424. On demand.		

CIVE 615	Soil and Site Improvement	3(3, 0)
Mechanical methods: compaction theory, properties of compacted soils, laboratory tests, field equipment, compaction specifications and control, dynamic compaction, vibroflotation, blasting techniques. Hydraulic methods: theory of wells, dewatering systems, drainage of slopes, preloading and use of vertical sand/wick drains. Physical and chemical methods: granular admixtures, Portland cement, lime, calcium chloride, fly ash, bitumen, grouting materials and techniques. Inclusion methods: reinforced earth with steel strips or geosynthetics, soil nails and rock bolts. Laboratory and computer applications. **Pre-requisite:** CIVE 424. On demand.		

CIVE 616	Advanced Construction Systems	3(3,0)
Composite systems; composite beams and columns; Lateral resisting systems; Braced Frames, Moment Resisting Frames (OMRF-SMRF), Shear Wall, Dual System, Core System. Design and detailing of special joints. **Pre-requisite**: CIVE 415, CIVE 417. On demand.		

CIVE 617	Soil Strength and Slope Stability	3(3,0)
Slope stability is a critical element of geotechnical engineering, involved in virtually every civil engineering project. Soil Strength and Slope Stability course aims to provide a detailed background to Mechanics of soil, limit equilibrium procedures, discuss classification of mass movement and landslides types, analyze slope stability, safety and reliability, and investigate the main methods of slope design and stabilization. **Pre-requisite**: CIVE423. On demand.		

CIVE 618	Special Topics in Design	3(3,0)
Design of bearing and retaining walls, strut-and-tie model; deep beams, corbels, inverted beams, water tanks, domes, ring beams and beams subjected to torsion; finite element modeling and design of plates and shells. **Pre-requisite**: CIVE 510 On demand.		

Water & Waste Water Treatment

CIVE 672	Environmental Impact Assessment	3(3,0)
Study and evaluation of the impacts of large scale projects on the physical, biological, and socio-economic environmental aspects taking into account environmental laws and regulations and EIA guidelines, identification of impacts, quantification methods, mitigation measures, and monitoring plans. Case study involving the preparation of an		

EIA report including sustainability impact assessment and preparation of an environmental management plan. **Co-requisite**: CIVE 538 and ENGL 217. On demand.

CIVE 673	**Irrigation and Drainage Engineering**	**3(3, 0)**
Irrigation: planning and design of canals networks, field irrigations, sprinkler irrigation system, drip irrigation system, drainage: importance of drainage, open drainage design and planning, tile drainage design and planning, canal lining design. **Pre-requisite:** CIVE 536. On demand.		

CIVE 674	**Environmental Policy and Management**	**3(3,0)**
This course explores human made problems in the environment parallel with concepts in environmental ethics, management and policies so as solutions are provided concerning preservation of the environment. Topics covered are pollution of air, water, and soil, international and national environmental ethics, management and policies. **Pre-requisite**: CIVE 332. On demand.		

CIVE 675	**Hydraulic and Hydrologic Modeling**	**3(3, 0)**
Hydraulic modeling: Physical modeling, numerical modeling, hydrologic modeling, application of deterministic and probabilistic concept to simulate and analyze hydrologic systems; discussion of the theory and application of linear and non-linear, lumped, and distributed systems techniques in modeling the various phases of the hydrologic cycle. **Pre-requisite:** CIVE 536. On demand		

CIVE 676	**Hydraulic Structures**	**3(3,0)**
Hydraulic aspects of the theory and design of hydraulic structures, types of dams and their function, stability analysis of gravity dams, culverts, navigation canals, reservoirs and port facilities, control structures such as gates and weirs. **Pre-requisite**: CIVE 424, CIVE 536. On demand.		

Public Works

CIVE 605	**Decision Making and Risk Management**	**3(3,0)**
Decision making, risk analysis, quantitative analysis, and application of quantitative methods to construction projects' environment. **Pre-requisite:** Senior Standing.		

CIVE 642	Bridge Engineering	3(3,0)
Types of bridges and influence lines. Loads and their distribution on bridges, serviceability of bridges, design of bridge deck, superstructure, and substructure. **Pre-requisite**: CIVE 415; CIVE 424. On demand.		

CIVE 643	Advanced Highway Engineering	3(3, 0)
Highway and Airport pavement design (flexible and rigid pavements), Stress Analysis in flexible and rigid pavements, pavement response under traffic load, failure of flexible and rigid pavements, highway pavement maintenance and rehabilitation (methods, programs, management), types and design, Hot mix Asphalt Concrete: Materials, Design Methods and Testing. **Pre-requisite:** CVLE 342, CIVE 415. On demand.		

CIVE 644	Airports Engineering	3(3, 0)
Principles of Airport Planning, Components of Airports (airside, landside), Aircraft characteristics, Airport operations, Airport System planning, Site selection, Land use, Airport terminal area and airport access, Airport Capacity and delays, Airport geometric design (Runways, Taxiways, Aprons), Safety Surfaces (Obstacle limitation surfaces: approach, take-off, transition, conical, horizontal), Airport pavement (types, design, construction). **Pre-requisite:** CIVE 342. On demand.		

CIVE 645	Urban Transportation Planning	3(3, 0)
A detailed review of the transportation planning process; inventory methodologies; trip generation, distribution and assignment with associated mathematical models and theories; prediction of future travel; land and use models; modal split; developing and testing of proposed systems; simulation. **Pre-requisite:** CIVE 342. On demand.		

CIVE 685	Advanced Topics in Civil and Environmental Engineering	3(3, 0)
A detailed investigation of advanced topics of current significance in civil and environmental engineering such as: design of small earth dams, man and the environment, drilling and blasting, scheduling construction operations, operations research and optimization, construction equipment and methods, traffic safety, optimum structural design, environmental impact analysis, infrastructure networks, water and wastewater treatment, solid waste management, air pollution, systems analysis in civil engineering, and current issues and advances in civil and environmental engineering. May be repeated to a maximum of 6 credits, but only 3 credits can be earned under the same title. **Pre-requisite:** Graduate studies.		

Electrical Engineering Program

The following study plan summarizes the courses and credit distribution for the Masters of Science (MS) in Electrical Engineering. The following study plan serves as a roadmap for a smooth progression toward graduation.

Course #	Title	Credits	Pre-requisites
ENGR 600	Engineering Research Methods	3	
ELEC 690	Capstone Research Project (non-thesis option)	3	ENGL 217
ELEC 695A	Thesis I (thesis option)	3	Co-req: ENGL 217
ELEC 695B	Thesis II (thesis option)	3	ELEC 695 A
ELEC 6xx	Technical Elective I	3	
ELEC 6xx	Technical Elective II	3	
ELEC 6xx	Technical Elective III (non-thesis option)	3	
ELEC 6xx	Technical Elective IV (non-thesis option)	3	

A. Engineering Research Methods

The research methodology course is mandated by the MEHE. This course must be taken by all MS bound students. However the specific experiences organized around the general topics may be tailored to meet program's need. The description of the Engineering required course is described below.

ENGR 600	Engineering Research Methods	3(3,0)
This course introduces students to quantitative and qualitative methods for engaging in meaningful research. The student, at the end of the course, will attain skills in research intent and design, methodology and technique, format and presentation, and data management. Throughout the course, the student's ability to use this knowledge to become a more effective researcher will be developed. In particular, the student will be able to develop a hypothesis about a research problem and develop related questions; frame the problem with the correct research methodology; collect data that accurately addresses the research problem; measure the effectiveness of a solution methodology; analyze data to make informed decisions; provide technical documentation of all the phases of a research project; evaluate feasibility of research proposals; and present data to support decisions in front of stakeholders.		

B. Research Project and Thesis

ELEC 690	Capstone Research Project	3(3, 0)
A capstone course requiring group work in one of the emphasis areas offered by the Department. The project is to be carried out under the supervision of a full-time faculty member and culminated in a formal written and oral report (refer to college guidelines related to graduation projects structure and content). **Pre-requisite:** ENGL 217.		

ELEC 695A	Master Thesis I	3(3, 0)
Includes guided review of research literature and/or pilot work relevant to the thesis topic. By the end of this course the candidate for the MS degree should have established a hypothesis, a research methodology and a work schedule for the completion of his/her thesis. A brief, written report is expected at the end of the course and should be approved by the research advisor(s). (This course may be repeated only once to accomplish its objective). **Co-requisite:** ENGL 217.		

ELEC 695B	Master Thesis II	3(3, 0)
Continuation of ELEC 695A - Includes the completion and submission of a research thesis, the quality of which is judged acceptable by the jury committee established in accordance with the College of Engineering and Graduate Committee guidelines. (This course may be repeated only once to accomplish its objective). **Pre-requisite:** ELEC 695A.		

C. Elective Courses

As part of the program for the Masters of Science in Electrical Engineering, the student is required to take a total of 6 credit hours (12 credit hours for non-thesis option) of 600 level technical elective courses. These courses allow the student to attain an in-depth knowledge and understanding in a focus area of interest. The student who chooses the non-thesis option can mix and match elective courses from the different areas to acquire broader knowledge of different Electrical Engineering disciplines. The thesis option student should select, in coordination with the thesis advisor, the set of electives that best meet the requirements for successful completion of his/her thesis. The ELEC available technical elective courses are distributed in three areas:

1. Power
2. Renewable Energy
3. Intelligent Systems

It is highly recommended that students take elective courses from the list below after completing the mandatory requirements in the related area. Students may select technical electives from other programs subject to the approval of the thesis committee. The list of recommended technical electives is given below.

Course #	Title	Credits
ELEC 685	Advanced Topics in Electrical Engineering	3
Power		
ELEC 611	Computer Modeling of Electrical Power Systems	3
ELEC 612	Electric Power System Control	3
Renewable Energy		
ELEC 621	Renewable Energy Resources and Technologies	3
ELEC 622	The Smart Grid	3
Intelligent Systems		
ELEC 631	Digital Control	3
ELEC 632	Nonlinear Adaptive Control	3

Courses Description

ELEC 685	Advanced Topics in Electrical Engineering	3(3,0)
This course is designed to enable students to study current advanced topics of interest which are carefully selected from ELEC-related topics. The contents of such a course are to be determined by the instructor and the department.		

Power

ELEC 611	Computer Modeling of Electrical Power Systems	3(3,0)
This course is intended to teach electrical engineering students how to simulate the changing states of electrical power systems by studying the performance and predicting the disturbances of the power system boosted by the FACTS. It describes the mathematical background, algorithms and the basic tools needed to simulate interconnected complex power systems and likely response to different types of network pathologies or disturbances.		

ELEC 612	Electric Power System Control	3(3,0)
This is a course on the structure of modern power systems, the different levels of control, and the nature of stability problems. The course will introduce students to the generators, excitation systems, prime movers, ac and dc transmission, and system		

loads as well as the principles of active and reactive power control, and models for control equipment.

Renewable Energy

ELEC 621	Renewable Energy Resources and Technologies	3(3,0)
This course covers renewable energy technologies from the engineering point of view: applications, engineering calculations and design, feasibility and so on. The main aim of the course is to provide the student with a systematic understanding of current knowledge, problems and insight into the field of renewable energy technologies.		

ELEC 622	The Smart Grid	3(3,0)
The use of communications and information technologies is likely to cause major shifts in the way energy gets delivered. The smart grid will use these technologies to deliver electricity reliably and efficiently, and it has the potential to radically change the electricity sector in the same way that new technologies changed the telecommunications sector. This course will examine not just the smart grid technologies, but the transformational impacts of the smart grid on the industry. Students in this course will learn the fundamentals of the smart grid: its purpose and objectives, its technologies, its architectures, and its management. Students will also learn many of the challenges facing the smart grid as part of its evolution.		

Intelligent Systems

ELEC 631	Digital Control	3(3,0)
This course is a comprehensive introduction to digital control system analysis and synthesis. The course covers analysis and synthesis of sampled-data control systems. It capitalizes on the knowledge of the student in Classical Control to extend classical methods for analysis and synthesis of digital control systems. The course also introduces digital control methods which are not based on classical control theory.		

ELEC 632	Nonlinear Adaptive Control	3(3,0)
This course presents a comprehensive exposition of the theory of nonlinear dynamical systems and its control. It will focus on (1) methods of characterizing and understanding the behavior of systems that can be described by nonlinear ordinary differential equations, and (2) methods for designing controllers for such systems. In the design parts we will focus on the nonlinear robust adaptive control. Both classical and modern concepts from nonlinear system theory will be introduced.		

Computer and Communications Engineering Program

The following study plan summarizes the courses and credit distribution for the Masters of Science (MS) in Computer and Communications Engineering. The following study plan serves as a roadmap for a smooth progression toward graduation.

Course #	Title	Credits	Pre-requisites
ENGR 600	Engineering Research Methods	3	
CCEE 690	Capstone Research Project (non-thesis option)	3	ENGL 217
CCEE 695A	Thesis I (thesis option)	3	Co-req: ENGL 217
CCEE 695B	Thesis II (thesis option)	3	CCEE 695 A
CCEE 6xx	Technical Elective I	3	
CCEE 6xx	Technical Elective II	3	
CCEE 6xx	Technical Elective III (non-thesis option)	3	
CCEE 6xx	Technical Elective IV (non-thesis option)	3	

A. Engineering Research Methods

The research methodology course is mandated by the MEHE. This course must be taken by all MS bound students. However the specific experiences organized around the general topics may be tailored to meet program's need. The description of the Engineering required course is described below.

ENGR 600	**Engineering Research Methods**	**3(3,0)**
This course introduces students to quantitative and qualitative methods for engaging in meaningful research. The student, at the end of the course, will attain skills in research intent and design, methodology and technique, format and presentation, and data management. Throughout the course, the student's ability to use this knowledge to become a more effective researcher will be developed. In particular, the student will be able to develop a hypothesis about a research problem and develop related questions; frame the problem with the correct research methodology; collect data that accurately addresses the research problem; measure the effectiveness of a solution methodology; analyze data to make informed decisions; provide technical documentation of all the phases of a research project; evaluate feasibility of research proposals; and present data to support decisions in front of stakeholders.		

B. Research Project/Thesis

CCEE 690	Capstone Research Project	3(3, 0)
A capstone course requiring group work in one of the emphasis areas offered by the Department. The project is to be carried out under the supervision of a full-time faculty member and culminated in a formal written and oral report (refer to college guidelines related to graduation projects structure and content). **Pre-requisite:** ENGL 217.		

CCEE 695A	Master Thesis I	3(3, 0)
Includes guided review of research literature and/or pilot work relevant to the thesis topic. By the end of this course the candidate for the MS degree should have established a hypothesis, a research methodology and a work schedule for the completion of his/her thesis. A brief, written report is expected at the end of the course and should be approved by the research advisor(s). (This course may be repeated only once to accomplish its objective). **Co-requisite:** ENGL 217.		

CCEE 695B	Master Thesis II	3(3, 0)
Continuation of CCEE 695A, Includes the completion and submission of a research thesis, the quality of which is judged acceptable by the jury committee established in accordance with the College of Engineering and Graduate Committee guidelines. (This course may be repeated only once to accomplish its objective). **Pre-requisite:** CCEE 695A.		

C. Elective Courses

As part of the program for the Masters of Science in Computer and Communications Engineering, the student is required to take a total of 6 credit hours (12 credit hours for non-thesis option) of 600 level technical elective courses. These courses allow the student to attain an in-depth knowledge and understanding in a focus area of interest. The student who chooses the non-thesis option can mix and match elective courses from the different areas to acquire broader knowledge of different Computer and Communications Engineering disciplines. The thesis option student should select, in coordination with the thesis advisor, the set of electives that best meet the requirements for successful completion of his/her thesis. The CCEE available technical elective courses are distributed in four areas:

1. Computer Software and Artificial Intelligence
2. Computer Hardware
3. Networking

4. Signal Processing and Wireless Communications

It is highly recommended that students take elective courses from the list below after completing the mandatory requirements in the related area. Students may select technical electives from other programs subject to the approval of the thesis committee. The list of recommended technical electives is given below.

Course #	Title	Credits	Pre-requisites
CCEE 685	Advanced Topics in Computer and Communication Engineering	3	
Computer Software and Artificial Intelligence			
CCEE 611	Game Design and Programming	3	CCEE 316
CCEE 612	Advanced Data Mining	3	CCEE 564
Computer Hardware			
CCEE 621	Reconfigurable Computing	3	CCEE 426
CCEE 623	Advanced Embedded Systems	3	CCEE 426
Networking			
CCEE 631	Multimedia Systems	3	CCEE 447
CCEE 632	Ad-hoc Networks	3	CCEE 454
Signal Processing and Wireless Communications			
CCEE 641	Security in Wireless Networks	3	CCEE 552
CCEE 642	Satellite Communication Systems	3	CCEE 341

Courses Description

CCEE 685	**Advanced Topics in Computer and Communication Engineering**	**3(3,0)**
This course is designed to enable students to study current advanced topics of interest which are carefully selected from CCE-related topics. The contents of such a course are to be determined by the instructor and the department.		

Computer Software and Artificial Intelligence

CCEE 611	**Game Design and Programming**	**3(3,0)**
This courses teaches the student basics of object-oriented architectures and software design patterns used in game design. The student will learn how to design and implement several kinds of games, animation techniques, physics simulation, user controls, graphical methods, and intelligent behaviors. **Pre-requisite:** CCEE 316.		

CCEE 612	Advanced Data Mining	3(3,0)
In this course advanced data mining topics will be covered, namely: classification (decision trees, logistic regression, support vector machines), combining multiple learners (bagging, boosting, cascading, stacking), clustering (k-means, EM, hierarchical clustering, topic modeling), dimensionality reduction (principal component analysis, linear discriminant analysis, subset selection), and graphical models (Bayesian networks, Markov networks). More advanced topics will be covered through student presentations such as: active learning, multi-label learning, graph mining, link prediction, data mining in bioinformatics, social media analytics, privacy-aware data mining, viral marketing, recommender systems, large scale data mining, temporal pattern mining, stream data mining, and outlier detection. **Pre-requisite:** CCEE 564.		

Computer Hardware

CCEE 621	Reconfigurable Computing	3(3,0)
This course introduces the student to the state-of-the-art in reconfigurable computing (RC) from a hardware as well as software perspectives. Numeric and signal processing applications will be used to illustrate RC platforms advantages. Field-programmable gate arrays (FPGAs) will be reviewed first focusing on their hardware limitations and their effect on the placement and routing problems. Then the architecture for existing multi-FPGA systems and the compilation techniques for mapping applications described in a hardware description language to RC are introduced. Finally, specific contemporary RC systems are examined. Students will be expected to work with recent existing RC hardware to design and implement working projects. **Pre-requisite:** CCEE 326.		

CCEE 623	Advanced Embedded Systems	3(3,0)
This course introduces the student to Real-time operating systems (RTOS). The RTOS topics of managing multiple tasks and processes, context switching, task scheduling, and inter-process communication mechanisms are introduced. The student will also learn how to ensure system reliability and fault tolerance. Student will be expected to use state of the art development tools to design and implement useful projects. **Pre-requisite:** CCEE 326.		

Networking

CCEE 631	Multimedia Systems	3(3,0)
Multimedia applications and requirements, Audio/Video fundamentals including analog and digital representations, human perception, and audio/video equipment, audio and video compression including perceptual transform coders for images/video scalable coders and perceptual audio encoders. Application and performance comparison of various coding algorithms including hardware/software trade-offs. Image and video processing applications and algorithms. Multimedia hardware and software. **Pre-requisite:** CCEE 447.		

CCEE 632	Ad-hoc Networks	3(3,0)
This course will provide students with an understanding of wireless ad-hoc networks, enable them to recognize the wide range of applicability of these networks, and provide them with an understanding of the major design issues, including topics such as protocol mechanisms and resource constraints. **Pre-requisite:** CCEE 454.		

Signal Processing and Wireless Communications

CCEE 641	Security in Wireless Networks	3(3,0)
This course will present the most important mechanisms dedicated to protect data integrity and confidentiality, access control, authentication, user privacy, quality and continuity of service, in wireless networks. Topics include: Wireless Technology Overview, Risks and Threats of Wireless, Security under Resource Constraints (bandwidth, memory, computation, energy constraints), Intrusion and Anomaly Detection in Wireless Environments, Key Management in Wireless Environments, Privacy and Anonymity in Wireless Environments, Public Key Infrastructure in Wireless Environments, Authentication, Authorization, and Access Control in Wireless Environments, Standards in Wireless Security (Equivalent Privacy Standard (WEP), Extensible Authentication Protocol (EAP), Wi-Fi Protected Access (WPA, WPA2, IEEE 802.11i), Bluetooth Security, RFID Security, Secure Mobile Commerce, Secure Wireless Multimedia Broadcast. **Pre-requisite:** CCEE 552.		

CCEE 642	Satellite Communication Systems	3(3,0)
Description of a Satellite Communication System, Orbit Types, Radio Regulations Applications of Communication Satellites. Multiple Access Techniques. Multi-beam Satellite Systems, Regenerative Satellite Systems, Broadcasting by Satellites, Satellite Communication Techniques, Satellite Communication Payload, Earth Station Technology. **Pre-requisite**: CCEE 341.		

Biomedical Engineering Program

The following study plan summarizes the courses and credit distribution for the Masters of Science (MS) in Biomedical Engineering. The following study plan serves as a roadmap for a smooth progression toward graduation.

Course #	Title	Credits	Pre-requisites
ENGR 600	Engineering Research Methods	3	
BIOM 690	Capstone Research Project (non-thesis option)	3	ENGL 217
BIOM 695A	Thesis I (thesis option)	3	Co-req: ENGL 217
BIOM 695B	Thesis II (thesis option)	3	BIOM 695 A
BIOM 6xx	Technical Elective I	3	
BIOM 6xx	Technical Elective II	3	
BIOM 6xx	Technical Elective III (non-thesis option)	3	
BIOM 6xx	Technical Elective IV (non-thesis option)	3	

A. Engineering Research Methods

The research methodology course is mandated by the MEHE. This course must be taken by all MS bound students. However the specific experiences organized around the general topics may be tailored to meet program's need. The description of the Engineering required course is described below.

ENGR 600	**Engineering Research Methods**	**3(3,0)**
This course introduces students to quantitative and qualitative methods for engaging in meaningful research. The student, at the end of the course, will attain skills in research intent and design, methodology and technique, format and presentation, and data management. Throughout the course, the student's ability to use this knowledge to become a more effective researcher will be developed. In particular, the student will be able to develop a hypothesis about a research problem and develop related questions; frame the problem with the correct research methodology; collect data that accurately addresses the research problem; measure the effectiveness of a solution methodology; analyze data to make informed decisions; provide technical documentation of all the phases of a research project; evaluate feasibility of research proposals; and present data to support decisions in front of stakeholders.		

B. Research Project/Thesis

BIOM 690	Capstone Research Project	3(3, 0)
A capstone course requiring group work in one of the emphasis areas offered by the Department. The project is to be carried out under the supervision of a full-time faculty member and culminated in a formal written and oral report (refer to college guidelines related to graduation projects structure and content). **Pre-requisite:** ENGL 217.		

BIOM 695A	Master Thesis I	3(3, 0)
Includes guided review of research literature and/or pilot work relevant to the thesis topic. By the end of this course the candidate for the MS degree should have established a hypothesis, a research methodology and a work schedule for the completion of his/her thesis. A brief, written report is expected at the end of the course and should be approved by the research advisor(s). (This course may be repeated only once to accomplish its objective). **Co-requisite:** ENGL 217.		

BIOM 695B	Master Thesis II	3(3, 0)
Continuation of BIOM 695A, Includes the completion and submission of a research thesis, the quality of which is judged acceptable by the jury committee established in accordance with the College of Engineering and Graduate Committee guidelines. (This course may be repeated only once to accomplish its objective). **Pre-requisite:** BIOM 695A.		

C. Elective Courses

As part of the program for the Masters of Science in Biomedical Engineering, the student is required to take a total of 6 credit hours (12 credit hours for non-thesis option) of 600 level technical elective courses. These courses allow the student to attain an in-depth knowledge and understanding in a focus area of interest. The student who chooses the non-thesis option can mix and match elective courses from the different areas to acquire broader knowledge of different Biomedical Engineering disciplines. The thesis option student should select, in coordination with the thesis advisor, the set of electives that best meet the requirements for successful completion of his/her thesis. The BIOM available technical elective courses are distributed in three areas:

1. Medical Instrumentation and Imaging
2. Clinical Engineering and Bio-informatics
3. Artificial organs

It is highly recommended that students take elective courses from the list below after completing the mandatory requirements in the related area. Students may select technical electives from other programs subject to the approval of the thesis committee. The list of recommended technical electives is given below.

Course #	Title	Credits	Pre-requisites
Medical Instrumentation and Medical Imaging			
BIOM 611	Interventional Treatment Systems	3	BIOM 414
BIOM 612	Emerging Techniques in Healthcare	3	BIOM 417
BIOM 613	Human Performance Engineering	3	BIOM 530
BIOM 621	Cardiovascular Explorations and Angiographic Procedures	3	BIOM 522
BIOM 622	MRI Research and Innovations	3	BIOM 522
BIOM 623	Functional and Molecular Imaging	3	BIOM 522; BIOM 530
Clinical Engineering and Bio-informatics			
BIOM 631	Risk Management	3	
BIOM 632	Health Care Facility Management	3	
BIOM 633	Medical Technology & Ethics	3	BIOM 531
BIOM 651	Medical Informatics and Artificial Intelligence	3	
BIOM 652	Bio-computation	3	
BIOM 653	Biometrics	3	
Artificial Organs			
BIOM 641	Prostheses	3	BIOM 519
BIOM 642	Transport Phenomena	3	BIOM 522
BIOM 643	Genetic and Tissue Engineering	3	BIOM 416

Courses Description

BIOM 685	Advanced Topics in Biomedical Engineering	3(3,0)
This course is designed to enable students to study current advanced topics of interest which are carefully selected from BIOM-related topics. The contents of such a course are to be determined by the instructor and the department.		

Medical Instrumentation and Medical Imaging

BIOM 611	Interventional Treatment Systems	3(3,0)
This course introduces students to the contributions of technology to direct disease treatment. It highlights the need for reliable technology development for surgical suite healthcare interface. The emphasis will be on assessing the wide variety of technologies that have made surgical procedures more reliable, less traumatic, and shorter in duration, as well as understanding materials know-how advances that lead to the development of technologies allowing minimally invasive treatment of a variety of diseases. Covered topics include: anesthesia/monitoring devices, intraoperative neurophysiological monitoring, spontaneous activity, angioplasty, stents, embolic filters, cardiac ablation catheters, stereotactic procedures and clinical applications. **Pre-requisite**: BIOM 414.		

BIOM 612	Emerging Techniques in Healthcare	3(3,0)
This course introduces students to new treatment and diagnosis strategies, as well as new applications of existing technologies, have emerged wide range of ideas as case studies in innovation. It highlights the factors determining the degree to which these techniques become accepted. The emphasis will be on proving the efficacy of the emerging medical technologies. Covered topics include: hyperbaric oxygen therapy, indications and outcomes for hyperbaric oxygen treatment, delivery strategies for image-guided thermal therapy, electrotherapy, hearing and audiologic assessment, pure-tone audiometry, speech recognition testing, spontaneous otoacoustic emissions (SOAE), immittance audiometry, slit lamp, opthalmology sets, ear, nose and throat (ENT) devices. **Pre-requisite**: BIOM 417.		

BIOM 613	Human Performance Engineering	3(3,0)
This course describes concepts, methods, and tools that strive toward treatment of each of specific areas with the engineering rigor that is routinely applied to artificial systems. It emphasizes on the evaluation of an individual's performance capacities; the design of assistive devices and the design of operator interfaces for medical		

instruments. Importance is thus placed on combination of cause-and-effect and statistical models, measurements of varying degrees of sophistication that are selected to fit needs of a particular circumstance, and various types of analyses. Covered topics include: gait analysis, neuromuscular functional unit, range of motion and extremes of motion, endurance, reliability, limitations, analysis of sensory-motor control performance, measurement instruments and procedures, models of human mental processing and performance, physical task analysis. **Pre-requisite**: BIOM 530.

BIOM 621	**Cardiovascular Explorations and Angiographic Procedures**	**3(3,0)**

This course describes interaction between biomechanics and medical imaging disciples through discussion of various imaging modalities and techniques used for the diagnosis for heart and vessel complications. It emphasizes on the study of blood flow, investigation of vessels properties, assessment of arteries dimensions and obstructions as well as monitoring of injected catheters and/or stents. The interests and principles of non-invasive methods such as Ultrasound and NMR will be detailed also purposes of X-ray based interventional imaging systems will be presented. Covered topics include: Colored Doppler, Cardiac MRI, Cardiac Function, Atherosclerosis, Carotid Bifurcation, Brain Perfusion, Fluoroscopy, contrast agents. **Pre-requisite**: BIOM 522.

BIOM 622	**MRI Research and Innovations**	**3(3,0)**

This course introduces students to the latest improvement in diagnosis and health care follow-up using magnetic resonance imaging systems. The emphasis will be on presenting MR sequence engineering applications in divers medical fields, as well as discussing MR based spectroscopy principles and objectives. The MR safety, complications, artifacts definition, limitations and associated proposed solutions will be detailed. Covered topics include: Fast Spin Echo, FLAIR, Time of flight, Diffusion Weighted Imaging, Parallel Imaging, Magneto hydrodynamics, Magnetic susceptibility, aliasing, saturation. **Pre-requisite**: BIOM 522.

BIOM 623	**Functional and Molecular Imaging**	**3(3,0)**

This course introduces student to in vivo characterization of biological processes at the cellular and molecular level, and visualization of in vivo physiologic or biochemical processes achieved with different imaging modalities, mostly MRI, PET and SPECT. The course will highlight increasing attention this type of imaging has received in recent years because imaging the distribution of targeted molecules allows the tracking of biochemical processes before their physiological consequences appear. Several applications in neurological studies and cardiovascular explorations are to be

described. Covered topics include: Kinetic modeling, parametric imaging, glucose metabolism, radioactive tracer, regional cerebral blood flow, regional cerebral oxygen extraction fraction (rCOEF), and the arterial oxygen concentration (CaO2). **Pre-requisite**: BIOM 522 and BIOM 530.

Clinical Engineering and Bio-informatics

BIOM 631	**Risk Management**	**3(3,0)**
This course describes deep roots inside health care of the organized effort to identify, assess, and reduce physical and financial risk to patients, staff, and business. The emphasis will be on new initiatives by international regulatory agencies to inject risk management techniques into the development and use of medical devices. Also the course will discuss the risk management model, process, steps, regulations, assessment and identification. Covered topics include: Enterprise risk, Total quality management (TQM), Performance improvement (PI), Failure mode and effect analysis (FMEA), Corrective and preventive action (CAPA), Risk analysis–ISO/IEC 14971, Root cause analysis (RCA).		

BIOM 632	**Health-care Facility Management**	**3(3,0)**
This course presents procedures followed for medical and health services management. It covers duties of administrator and his assistants, as well as work flow between staffs of different services and departments. It emphasis on credentials, quality control, human resources, finances, recovery, insurance, sterilization, infection control and health safety procedures. **Pre-requisite**: BIOM 421.		

BIOM 633	**Medical Technology & Ethics**	**3(3,0)**
This course introduces students to the ethical dilemmas and challenges that have emerged with the positive outcomes of biomedical engineering regarding its responsibility in developing new treatment modalities that have significantly improved medical care, the quality of life for patients. The course will stress on the involvement of humans in clinical research, the definition of death and the issue of euthanasia, the animal experimentation and human trials for new medical devices, the patient access to sophisticated and high cost medical technology, and the regulation of new biomaterials and devices. Covered topics include: professions, sources of professional ethics, professional integrity, responsibility, code, euthanasia, animal experimentation, regulation of medical device innovation, ethical issues in emergency use, ethical issues in treatment use, the safe medical devices act. **Pre-requisite**: BIOM 531.		

BIOM 651	Medical Informatics and Artificial Intelligence	3(3,0)
This course describes the growth of bioinformatics field, its complexity and content. It will consist of two parts. The first defined as none artificial intelligence decision making and devoted to areas that form a key "core" of computer technologies such as hospital information systems (HIS), computer-based patient records (CPR), communications and standards. The second parts correspond to artificial intelligence based topics containing expert systems, knowledge-based systems neural networks. Covered topics include: Patient Database Strategies, Patient Management, Clinical Decision Support Systems, and Computer Networks in Health Care, HL7, PACS, Decision Theoretic Models, Statistical Models, Decision Making, Artificial Neural Networks, Training Algorithms, Clinical Decision Systems, and Expert System Process Model.		

BIOM 652	Bio-computation	3(3,0)
This course refers to several areas of research at the boundary between computation and biology. The emphasis will be on computational biology, natural computing via use of naturally inspired computing models to solve mathematical problems, and the attempt to exploit biomolecules and cells to perform computations. It will focus on DNA computing, in which one uses DNA molecules and their interactions to perform computations, as well as recent promising models such as membrane computing. Covered topics include: DNA sequencing, Polymerase chain reaction (PCR), Adleman's experiment, Stranded DNA, DNA computing on surfaces, Genomic data base and Bio-computational Models.		

BIOM 653	Biometrics	3(3,0)
This course deals with the automatic recognition of individuals based on statistical analysis of physiological and/or behavioral characteristics. The emphasis will be on biometric characteristic defined as human physiological or behavioral characteristic that is unique, universal, stable, and collectable. Covered topics include: biometric system structure, verification system, identification system, feature extraction, matching, decision, performance evaluation, finger print, palm print, face, iris, hand vein thermogram, DNA, ear, odor, etc.…		

Artificial Organs

BIOM 641	Prostheses	3(3,0)
This course describes fundamentals of substitutive medicine. It stresses on the interest of an engineered device or the transplantation of organs, tissues, or cells ability to substitute for most of organs and body functions. Highlight on categories, types, nature and principles of different artificial organs will be given. Covered topics include: Heart Valve Prostheses, Vascular Grafts, Hyperplasia, Graft Infections Liver Support Systems, Nerve Guidance Channels, ENT Replacement Devices, Artificial Blood, and artificial skin. **Pre-requisite**: BIOM 519.		

BIOM 642	Transport Phenomena	3(3,0)
The intention of this course is to couple the concepts of transport phenomena with chemical reaction kinetics and thermodynamics to introduce the field of reaction engineering. It encompasses the subjects of momentum transport (viscous flow), energy transport (heat conduction, convection, and radiation), and mass transport (diffusion). The media in which the transport occurs is regarded as continua; however, some molecular explanations are discussed. The continuum approach is of more immediate interest to engineers, but both approaches are required to thoroughly master the subject. Covered topics include: Microvascular Heat Transfer, Interstitial Transport in the Brain, Arterial Wall Mass Transport, and Concepts of Biomimicry. **Pre-requisite**: BIOM 542.		

BIOM 643	Genetic and Tissue Engineering	3(3,0)
This course introduces students to the unprecedented insight into the inner workings of the most basic structures of living tissues due to the information revealed by revolutionary undertakings, such as the human genome project. The attention will be focused on manipulating molecular architecture structures for therapeutic purposes. It will describe the techniques that have been developed to transplant genetic material into a variety of living tissues. Also, will be discussed the ability of affecting the future of many areas of disease treatment by developments in the field of tissue engineering. Covered topics include: transgenic animals, DNA microinjection, embryonic stem (ES) cell technology, cloning, tissue regeneration, fluid-induced shear, micropipette aspiration, chondrocytes, scaffold materials, protein coating. **Pre-requisite**: BIOM 416.		

Mechanical Engineering Program

The following study plan summarizes the courses and credit distribution for the Masters of Science (MS) in Mechanical Engineering. The following study plan serves as a roadmap for a smooth progression toward graduation.

Course #	Title	Credits	Pre-requisites
ENGR 600	Engineering Research Methods	3	
MECH 690	Capstone Research Project (non-thesis option)	3	ENGL 217
MECH 695A	Thesis I (thesis option)	3	Co-req: ENGL 217
MECH 695B	Thesis II (thesis option)	3	MECH 695 A
MECH 6xx	Technical Elective I	3	
MECH 6xx	Technical Elective II	3	
MECH 6xx	Technical Elective III (non-thesis option)	3	
MECH 6xx	Technical Elective IV (non-thesis option)	3	

A. Engineering Research Methods

The research methodology course is mandated by the MEHE. This course must be taken by all MS bound students. However the specific experiences organized around the general topics may be tailored to meet program's need. The description of the Engineering required course is described below.

ENGR 600	**Engineering Research Methods**	**3(3,0)**
This course introduces students to quantitative and qualitative methods for engaging in meaningful research. The student, at the end of the course, will attain skills in research intent and design, methodology and technique, format and presentation, and data management. Throughout the course, the student's ability to use this knowledge to become a more effective researcher will be developed. In particular, the student will be able to develop a hypothesis about a research problem and develop related questions; frame the problem with the correct research methodology; collect data that accurately addresses the research problem; measure the effectiveness of a solution methodology; analyze data to make informed decisions; provide technical documentation of all the phases of a research project; evaluate feasibility of research proposals; and present data to support decisions in front of stakeholders.		

B. Research Project/Thesis

MECH 690	Capstone Research Project	3(3, 0)
A capstone course requires group work in one of the emphasis areas offered by the Department. The project is to be carried out under the supervision of a full-time faculty member and culminated in a formal written and oral report (refer to college guidelines related to graduation projects structure and content). **Pre-requisite:** ENGL 217.		

MECH 695A	Master Thesis I	3(3, 0)
Includes guided review of research literature and/or pilot work relevant to the thesis topic. By the end of this course the candidate for the MS degree should have established a hypothesis, a research methodology and a work schedule for the completion of his/her thesis. A brief, written report is expected at the end of the course and should be approved by the research advisor(s). (This course may be repeated only once to accomplish its objective). **Co-requisite:** ENGL 217.		

MECH 695B	Master Thesis II	3(3, 0)
Continuation of MECH 695A, Includes the completion and submission of a research thesis, the quality of which is judged acceptable by the jury committee established in accordance with the College of Engineering and Graduate Committee guidelines. (This course may be repeated only once to accomplish its objective). **Pre-requisite:** MECH 695A.		

C. Elective Courses

As part of the program for the Masters of Science in Mechanical Engineering, the student is required to take a total of 6 credit hours (12 credit hours for non-thesis option) of 600 level technical elective courses. These courses allow the student to attain an in-depth knowledge and understanding in a focus area of interest. The student who chooses the non-thesis option can mix and match elective courses from the different areas to acquire broader knowledge of different Mechanical Engineering disciplines. The thesis option student should select, in coordination with the thesis advisor, the set of electives that best meet the requirements for successful completion of his/her thesis. The MECH available technical elective courses are distributed in two areas:

1. Mechanical Design and Manufacturing
2. Energy and Thermo-fluid Systems

It is highly recommended that students take elective courses from the list below after completing the mandatory requirements in the related area. Students may select technical electives from other programs subject to the approval of the thesis committee. The list of recommended technical electives is given below.

Course #	Title	Credits	Pre-requisites
Mechanical Design and Manufacturing			
MECH 601	Advanced Mechanics of Materials	3	MECH 320
MECH 602	Pressure Vessel and Piping Design and Analysis	3	
MECH 606	Fatigue and Fracture Mechanics Design and Evaluation	3	MECH 320; MECH 421
MECH 608	Advanced Manufacturing	3	MECH 422
MECA 604	Design of Mechanisms	3	MECH 321
MECA 607	Manufacturing System & Supply Chain Design	3	MECH 422
MECA 608	Lean/ Six Sigma Processes	3	
MECH 685	Advanced Topics in Mechanical Engineering	3	
Energy and Thermo-fluid Systems			
MECH 603	Combustion Engineering	3	MECH 334
MECH 604	Solar Energy	3	MECH 330 or MECH 333
MECH 605	Turbomachinery	3	MECH 335
MECH 607	Advanced Heat Transfer	3	MECH 431
MECH 609	Advanced Computational Fluid Dynamics	3	MECH 530
MECH 610	Advanced Fluid Mechanics	3	MECH 335
MECH 697	Advanced Topics in Mechanical Engineering	3	

Courses Description

Mechanical Design and Manufacturing

MECH 601	Advanced Mechanics of Materials	3(3,0)
3-D Stress tensor and invariants; constitutive models; theories of failure for ductile and brittle materials; plane stress/plane strain elasticity; unsymmetrical bending of straight beams; shear center for thin-walled cross-sectional beams; bending of curved beams		

and rings; axisymmetric geometry and loading; elasto-plastic analysis of thick-walled cylinders and autofrettage & shrink-fitting residual stresses; rectangular & circular thin plates; circular thick plates; Beam on elastic foundation theory and practice use of Roark's formula. **Pre-requisite**: MECH 320. On demand.

MECH 602	**Pressure Vessel and Piping Design & Analysis**	**3(3,0)**

Stress analysis and evaluation of thin-walled pressure vessels and piping components; material properties and temperature limit; design philosophy of ASME Section VIII, Division 1; design philosophy of Section VIII, Division 2; design calculations using Section VIII, Division 1; design calculations using B 31.3 Piping code; flange selection based on P/T ratings – ASME/B 16.5 / 16.47 standards; fabrication, inspection and testing of pressure vessels; safety valves; in-service inspection & monitoring; practical applications; design project. On demand.

MECH 606	**Fatigue and Fracture Mechanics Design and Evaluation**	**3(3,0)**

Material properties; stress intensity calculation; Brief S-N method used in non-pressurized mechanical components design: S-N method used in pressurized mechanical components design; effects of cracks and notches; fundamental of linear elastic fracture mechanics (LEFM) principles; crack-tip stress intensity factor calculations; fracture toughness evaluation; codes & standards; crack growth models, the use of finite element method in evaluating fatigue crack propagation life. **Pre-requisite**: MECH 320 and MECH 421. On demand.

MECH 608	**Advanced Manufacturing**	**3(3,0)**

Overview of advanced manufacturing: engineering materials, metal forming, particulate processing, solidification processes; non-traditional machining, understanding metrology and instrumentations; joining & assembly processes; micro-fabrication and nanofabrication technologies; automation technologies; production planning, control, and inspection; industrial visits. **Pre-requisite**: MECH 422.On demand.

MECH 685	**Advanced Topics in Mechanical Engineering**	**3(3,0)**

This course is designed to enable students to study a given advanced topic of interest, which is carefully selected from the mechanical engineering-related topics. The content outline of such a topic is to be determined by the instructor and to be approved by the department Chair. **Pre-requisite**: Instructor's consent. On demand.

Energy and Thermo-Fluid Systems

MECH 603	Combustion Engineering	3(3,0)
Fuels and their properties; review of basic thermodynamics and gaseous mixtures; combustion thermodynamics: stoichiometry; the first and second Laws of thermodynamics applied to combustion; composition products in equilibrium; fundamentals of combustion; applications. **Pre-requisite**: MECH 334. On demand.		

MECH 604	Solar Energy	3(3,0)
Solar geometry for stationary and tracking systems; solar energy availability and measurement; radiative, conductive and convective heat transfer pertinent to simple solar collectors; flat plate collectors and concentrators; energy storage; project. **Pre-requisite**: MECH 330 or MECH 333. On demand.		

MECH 605	Turbomachinery	3(3,0)
This course involves the design of turbo-compressors. It includes: Review of thermo-fluids; compressible flow; diffusion processes; centrifugal compressors; swept vanes; velocity triangles; slip factor; axial compressors; stage pressure rise; stage reaction and loading; compressor map and performance; blockage factor; aerofoil aerodynamics; tip clearance; CFD and axial compressor design projects. **Pre-requisite**: MECH 335. On demand.		

MECH 607	Advanced Heat Transfer	3(3,0)
Derivation of energy and mass conservation equations with constitutive laws for conduction, convection, radiation, and mass diffusion; dimensional analysis; heat exchangers; boiling and condensation. **Pre-requisite**: MECH 431. On demand.		

MECH 609	Advanced Computational Fluid Dynamics	3(3,0)
Structured and unstructured mesh, orthogonal and non-orthogonal grids; discretization of the general transport equation using the finite volume method (diffusion. Convection, source and transient term discretization); boundary conditions; various solvers; discretization of incompressible flow equations using finite volume method; derivation of the pressure correction equation; the SIMPLE algorithm; comparison of different convection schemes using Fluent solver; application of the finite volume method on steady state and transient 1D and 2D problems. **Pre-requisite**: MECH 530		

MECH 610	Advanced Fluid Mechanics	3(3,0)
Surface tension; vapor pressure and cavitation; integral and differential forms of continuity and momentum equations on a fixed and deforming control volume; boundary layer; dimensionless analysis of the equations of motion; introduction to micro flow applications. **Pre-requisite:** MECH 335.		

MECH 685	Advanced Topics in Mechanical Engineering	3(3,0)
This course is designed to enable students to study a given advanced topic of interest, which is carefully selected from the mechanical engineering-related topics. The content outline of such a topic is to be determined by the instructor and to be approved by the department Chair. **Pre-requisite**: Instructor's consent. On demand.		

Mechatronics Engineering Program

The following study plan summarizes the courses and credit distribution for the Masters of Science (MS) in Mechatronics Engineering. The following study plan serves as a roadmap for a smooth progression toward graduation.

Course #	Title	Credits	Pre-requisites:
ENGR 600	Engineering Research Methods	3	
MECA 690	Capstone Research Project (non-thesis option)	3	ENGL 217
MECA 695A	Thesis I (thesis option)	3	Co-req: ENGL 217
MECA 695B	Thesis II (thesis option)	3	MECA 695A
MECA 6xx	Technical Elective I	3	
MECA 6xx	Technical Elective II	3	
MECA 6xx	Technical Elective III (non-thesis option)	3	
MECA 6xx	Technical Elective IV (non-thesis option)	3	

A. Engineering Research Methods

The research methodology course is mandated by the MEHE. This course must be taken by all MS bound students. However the specific experiences organized around the general topics may be tailored to meet program's need. The description of the Engineering required course is described below.

ENGR 600	Engineering Research Methods	3(3,0)
This course introduces students to quantitative and qualitative methods for engaging in meaningful research. The student, at the end of the course, will attain skills in research intent and design, methodology and technique, format and presentation, and data management. Throughout the course, the student's ability to use this knowledge to become a more effective researcher will be developed. In particular, the student will be able to develop a hypothesis about a research problem and develop related questions; frame the problem with the correct research methodology; collect data that accurately addresses the research problem; measure the effectiveness of a solution methodology; analyze data to make informed decisions; provide technical documentation of all the phases of a research project; evaluate feasibility of research proposals; and present data to support decisions in front of stakeholders.		

B. Research Project/Thesis

MECA 690	Capstone Research Project	3(3, 0)
A capstone course requires group work in one of the emphasis areas offered by the Department. The project is to be carried out under the supervision of a full-time faculty member and culminated in a formal written and oral report (refer to college guidelines related to graduation projects structure and content). **Pre-requisite:** ENGL 217.		

MECA 695A	Master Thesis I	3(3, 0)
Includes guided review of research literature and/or pilot work relevant to the thesis topic. By the end of this course the candidate for the MS degree should have established a hypothesis, a research methodology and a work schedule for the completion of his/her thesis. A brief, written report is expected at the end of the course and should be approved by the research advisor(s). (This course may be repeated only once to accomplish its objective). **Co-requisite:** ENGL 217.		

MECA 695B	Master Thesis II	3(3, 0)
Continuation of MECA 695A, Includes the completion and submission of a research thesis, the quality of which is judged acceptable by the jury committee established in accordance with the College of Engineering and Graduate Committee guidelines. (This course may be repeated only once to accomplish its objective). **Pre-requisite:** MECA 695A.		

C. Elective Courses

As part of the program for the Masters of Science in Mechatronics Engineering, the student is required to take a total of 6 credit hours (12 credit hours for non-thesis option) of 600 level technical elective courses. These courses allow the student to attain an in-depth knowledge and understanding in a focus area of interest. The student who chooses the non-thesis option can mix and match elective courses from the different areas to acquire broader knowledge of different Mechatronics Engineering disciplines. The thesis option student should select, in coordination with the thesis advisor, the set of electives that best meet the requirements for successful completion of his/her thesis. The MECA available technical elective courses are distributed in two areas:

1. Automation
2. Mechanisms and Robotics

It is highly recommended that students take elective courses from the list below after completing the mandatory requirements in the related area. Students may select technical electives from other programs subject to the approval of the thesis committee. The list of recommended technical electives is given below.

Course #	Title	Credits	Pre-requisites
Automation			
MECA 601	Advanced Mechatronics System Design	3	MECA 443
MECA 602	Multi Agent System MAS	3	
MECA 607	Manufacturing System & Supply Chain Design	3	MECH 422
MECA 608	Lean/ Six Sigma Processes	3	
MECA 685	Advanced Topics in Mechatronics Engineering	3	
Mechanisms and Robotics			
MECA 603	Advanced Robotics	3	MECA 544
MECA 604	Design of Mechanisms	3	MECH 321
MECA 605	Spatial Mechanisms	3	MECA 541
MECA 606	Compliant Mechanisms	3	MECH 520; MECH 571
MECA 609	Advanced Control Theory	3	MECA 440
MECA 685	Advanced Topics in Mechatronics Engineering	3	

Courses Description

Automation

MECA 601	Advanced Mechatronics System Design	3(3,0)
This course uses computer-aided design methodologies for synthesis of multivariable Mechatronics system design. Topics covered include: sequential tasks integration of several engineering systems, finite state machine based design, direct problem, indirect problem, multi objective optimization problems, performance and robustness trade-offs, model-based compensators, and nonlinear effects. Pre-requisite: MECA 443.		

MECA 602	Multi Agent System MAS	3(3,0)
The objective of the course is to present tools and methodologies for performing system realization in a multidisciplinary design context. Focus will be equally strong on		

all three aspects of the problem: (i) the multidisciplinary character of engineering systems, (ii) design of these complex systems, and (iii) tools for realization. **Pre-requisite**: Instructor's consent.

MECA 607	Manufacturing System & Supply Chain Design	3(3,0)
This course focuses on decision making for system design, as it arises in manufacturing systems and supply chains. Students are exposed to frameworks and models for structuring the key issues and trade-offs. It also introduces various models, methods and software tools for logistics network design, capacity planning and flexibility, make-buy, and integration with product development. Industry applications and cases illustrate concepts and challenges. **Pre-requisite**: MECH 422.		

MECA 608	Lean/Six Sigma Processes	3(3,0)
Students of this course will develop a broad understanding of Lean/Six Sigma principles and practices, build capability to implement Lean/Six Sigma initiatives in manufacturing operations, and learn to operate with awareness of Lean/Six Sigma at the enterprise level. All course materials are organized around a common "single-point lesson" (SPL) format, with some of the SPLs provided by the instructor and guests and with some developed and delivered by student teams. **Pre-requisite**: Instructor's consent. On demand.		

MECA 685	Advanced Topics in Mechatronics Engineering	3(3,0)
This course is designed to enable students to study a given advanced topic of interest, which is carefully selected from the mechatronics engineering-related topics. The content outline of such a topic is to be determined by the instructor and to be approved by the department Chair. **Pre-requisite**: Instructor's consent. On demand.		

Mechanisms and Robotics

MECA 603	Advanced Robotics	3(3,0)
Current technology on robotics, sensing, and vision; Basic knowledge on how to make intelligent autonomous mobile robots using AI concepts; trajectory planning and obstacle avoidance; use of software packages, sensors, image acquisition and processing; autonomous mobile robots; applications of mobile robots; tele-robotics; future trends. **Pre-requisite**: MECA 544.		

MECA 604	Design of Mechanisms	3(3,0)
Mobility analysis of mechanisms; kinematic chains and inversions; precision synthesis techniques (graphical and analytical methods); introduction to different optimization techniques; optimum synthesis of mechanisms using gradient-based and global intelligent optimization methods; creative mechanism design project. **Pre-requisite**: MECH 321. Annually.		

MECA 605	Spatial Mechanisms	3(3,0)
General mobility criteria; describing spatial displacements; formulation of the kinematic equations; kinematic analysis and synthesis of spherical and spatial mechanisms; optimum synthesis of spherical and spatial kinematic chains; kinematics of robotic manipulators. **Pre-requisite**: MECA 544.		

MECA 606	Compliant Mechanisms	3(3,0)
Nonlinear beam theory; pseudo-rigid body model (PRBM); Flexible link model (FLM); synthesis of partially compliant mechanisms using PRBM and FLM; synthesis of fully compliant mechanisms (rigid body displacement and kinetostatic synthesis); finite element application; size, shape and topology optimization; research project**. Pre-requisite**: MECH 520, MECH 571.		

MECA 609	Advanced Control Theory	3(3,0)
The course covers various forms of process control, including statistical process control, run by run and adaptive control, and real-time feedback control, static optimization, optimal control for continuous-time systems, the tracking problem and other LQR extenders, adaptive and predictive control H-infinity controller design; Mu-synthesis; model and compensator simplification; and nonlinear effects. The assignments for the course comprise of computer-aided (MATLAB®) design problems. **Pre-requisite**: MECA 440. On demand.		

MECA 685	Advanced Topics in Mechatronics Engineering	3(3,0)
This course is designed to enable students to study a given advanced topic of interest, which is carefully selected from the mechatronics engineering-related topics. The content outline of such a topic is to be determined by the instructor and to be approved by the department Chair. **Pre-requisite**: Instructor's consent. On demand.		

Faculty List

Abdallah, Mirvat; Assistant Professor, PhD in Civil Engineering, 2013, Lille 1 University, France.

Abou Saleh, Zaher; Associate Professor, PhD in Civil Engineering, 2007, University of Miami, USA.

Al Wardany, Riad; Assistant Professor, PhD in Civil Engineering, 2005, University of Sherbrooke, Canada.

Basha, Hisham; Professor and Dean, PhD in Civil Engineering, 1994, University of Michigan, USA.

Diab, Mohammad; Associate Professor, PhD in Biomedical Engineering, 2007, University of Compiegne, France.

Diab, Nadim; Assistant Professor, PhD in Mechanical Engineering, 2013, American University of Beirut, Lebanon.

Hariri, Hassan; Assistant Professor, PhD in Mechatronics Engineering, 2012, University Paris-Sud, France.

Hijazi, Toufic; Professor, PhD in Electrical Engineering, 1988, Clarkson University, USA.

Khatib, Rabih; Instructor, MS. in Civil Engineering, Transportation, 2002, University of Balamand, Lebanon.

Mechaymech, Ahmad; Lecturer, PhD in Civil Engineering, Concrete Technology, 2010, University of Sherbrooke, Canada.

Moslem, Bassam; Assistant Professor, PhD in Signal Processing, 2011, University of Compiegne, France.

Nasreddine, Jad; Associate Professor, PhD in Computer Science, 2004, University of Rennes 1, France.

Sabbah, Maher; Assistant Professor, Ph.D, 2006, Biomedical Engineering, University of Technology of Campiegne (UTC) France and Universite Claude Bernard, Lyon, France.

Sawan, Jihad; Lecturer, PhD in Civil Engineering, Geotechnical & Highway Engineering, 1978, University of Illinois at Urbana Champaign, USA.

Serhal, Dina; Assistant Professor, PhD in Communications Engineering, 2009, University of Limoges, France.

Taha, Mohamad; Associate Professor, PhD in Electrical engineering, 1992, Aston University, UK.

Zantout, Rached; Associate Professor, PhD in Communications Engineering, 1994, Ohio State University, USA.

GRADUATE STUDIES FORMS

PROPOSED PLAN OF STUDY – GS1

This form should be filled out by the student and his/her advisor before the start of the second term of graduate studies. The student will commit to a MS track (Thesis or non-thesis), plan of study and courses to be taken. The form shall be used to follow the progress of the student until graduation.

Student Name		**ID #**	
Major		**Proposed Degree**	
MS Track	☐ Thesis track	☐ Non-thesis (CRP) track	
Thesis / Capstone Research Project (CRP)			
Proposed Title			

Research Advisors

Role	Name	Signature	Date
Advisor			
Co-Advisor			
Co-Advisor			

Note: Please Attach Updated Student Contract Sheet

Category	Course #	Course Name	Where?	When?	# Credits	Grade
Background Courses (credits do not count toward degree)						
Transfer Credits						
Mandatory Courses						

Elective Courses						
Total Credit Hours that count toward the degree						

500 level _____ 400 level _____

THESIS PLAN – GS2

This form should be filled out by students on thesis track to plan for the thesis defense.

Student Name		**ID #**	
Major		**Proposed Degree**	
MS Track	☐Thesis track ☐Project track		

Thesis/Project Title and Summary

Tentative Dates to Complete Milestones	
Thesis/Project Defense	
Graduation Date	

Thesis/Project Committee (optional for Project Track)			
Role	**Name**	**Signature**	**Date**
Chair			
Member			
Member			
Member			

Approvals			
	Name	**Signature**	**Date**
Department Chairperson			
College Dean (for the CGSC)			

READINESS REPORT FOR THESIS / CRP DEFENSE – GS [3]

This form should be filled out by the Main Research Advisor.

Student Name		**ID #**	
Major		**Degree**	

Undergraduate Degree			
Major		**Institution**	
GPA		**Class of**	

Prior Practical Experience	
Years of Experience	
Type of Experience	

Graduate Studies			
Major			
Enrollment Date		**Graduation Date**	
GPA		**Thesis / Project Advisor**	
Thesis / Project Title			

Performance Evaluation
Evaluate the thesis/Project on a scale from 1 to 4 (1 being minimally acceptable) on the basis of the following criteria: a. Independent research and generating new concepts and valuable conclusions [ ] b. Creativity and critical thinking [ ] c. Writing skills [ ]

Overall Assessment of The Thesis / Project (Advisor)			
Date of Submission of the Final Draft of Thesis / Project *			
Date:		**Signature:**	

* The final draft of the report must be submitted to each member of the Jury Committee at least two weeks (Thesis option) prior to the date of thesis defense, or a week (non-thesis option) before CRP presentation.

ASSESSMENT OF GRADUATE STUDENT'S PERFORMANCE GS 4

Student Name		**ID #**	
Major		**Degree**	

Undergraduate Degree			
Major		**Institution**	
GPA		**Class of**	

Prior Practical Experience	
Years of Experience	
Type of Experience	

Graduate Studies			
Major			
Enrollment Date		**Graduation Date**	
GPA		**Thesis Advisor**	
Thesis Title			

Performance Evaluation
Rate the student on a scale from 1 to 4 (1 being minimally acceptable) on the basis of the following criteria: a. Ability to conduct independent research and generate ideas ( ) b. Creativity and critical thinking ( ) c. Writing skills ( )
Overall Assessment of Graduate performance (Thesis Advisor)
Date: **Signature:**

MS REQUIREMENTS COMPLETION CHECKLIST – GS [5]

This form shall be completed by the GSRC coordinator and kept in the student's permanent record for future reference, assessment of graduate program and quality assurance measures.

Student Name		**ID #**	
Enrollment Date			
Graduation Date			
Academic Advisor			
Thesis/CRP Advisor			
Thesis/CRP Title			
Thesis/CRP Sponsor			

Graduate Studies Forms	**Date Completed**
GS-1	
GS-2	
GS-3	
GS-4	

Date thesis submitted to the Library	
Signature of the Librarian	

Role	**Name and Signature**	**Date**
Thesis/CRP Committee Chair		
Department Chair		
College Dean		
GSRC Coordinator		
Registrar		