

**Notre Dame University
Faculty of Engineering
Mechanical Engineering Department**

Annual Report

Academic Year 2009-2010

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1. Introduction

The Mechanical Engineering Department at Notre Dame University, Lebanon, is striving to graduate mechanical engineers able to cope with all challenging issues that normal engineers may face in nowadays societies. The challenges are not only technical, for which our graduates are well prepared, but also societal and, in this respect, ME graduates have the luggage necessary to help them move forward. To achieve that goal, the ME program at NDU involves a balance between not only theoretical and practical issues, but also between technical and non-technical or cultural aspects.

ME students at NDU are served by a group of devoted faculty members, both full-timers and part-timers, spending their time to guide them in all their expectations. Moreover, the university offers them state-of-the-art laboratories, which are under continuous upgrade. The program is also continuously updated to include the latest ideas related to engineering education in order to offer an up-to-date degree in mechanical engineering.

2. Personnel

2.1 Full-Time Faculty

- **Walid Assaf**, Professor Emeritus, Ph.D., Nuclear Engineering, 1965, Iowa State University (USA). *Areas of interest:* Thermodynamics, Energy, Prime Movers.
- **Michel El Hayek**, Associate Professor & Chairperson, Docteur Européen, Sciences Appliquées, 1997, Faculté Polytechniques de Mons (Belgium). *Areas of interest:* Fluid Mechanics, Heat Transfer, Numerical Techniques.
- **Ghazi Asmar**, Associate Professor, Ph.D., Mechanical and Aerospace Engineering, 1997, University of Missouri, Columbia (USA). *Areas of interest:* Mechanics of Materials, Vibrations, Numerical Techniques.
- **Francis Francis**, Assistant Professor, Ph.D., Mechanical and Manufacturing Engineering, 2003, University of New South Wales (Australia). *Areas of interest:* Materials Science, Engineering Mechanics, Manufacturing.
- **Najib Metni**, Assistant Professor, Docteur, Automatique et Traitement du Signal et des Images, 2006, Université de Nice, Sophia-Antipolis (France). *Areas of interest:* Control, Mechatronics, Robotics.
- **Charbel Bou Mosleh**, Assistant Professor, Ph.D., Aerospace Engineering Sciences, 2005, University of Colorado at Boulder (USA). *Areas of interest:* Fluid Mechanics, Thermodynamics, Numerical Techniques.

2.2 Part-Time Faculty

- **Tony Jabbour**, Ph.D., Mechanical Engineering, 1998, Ecole Polytechnique de Montréal (Canada). *Areas of interest:* Mechanical Design, Machinery, CAD/CAM.

- **Ali Hammoud**, Ph.D., Mechanical Engineering, 1990, University of Wales, Swansea (UK). *Areas of interest*: Applied Fluid Mechanics, HVAC.
- **Chady Azoury**, Doctorat, 2004, Université Paul Sabatier - Toulouse (France). *Areas of interest*: Engineering mechanics, Drafting.
- **Souhail Matar**, Ph.D., Mechanical Engineering, 1997, Byelorussian Polytechnic Academy (Belarus). *Areas of interest*: Internal Combustion Engines, Machinery.
- **Georges Challita**, Doctorat, Mechanical Engineering, 2009, Ecole Centrale de Nantes (France). *Areas of interest*: Mechanics of Materials, Vibrations.
- **John-Paul Daghfal**, Ph.D., Materials Engineering, 2009, Chinese Academy of Sciences (China). *Areas of interest*: Materials Sciences.

2.3 Full-Time Co-Academics

- **Wissam Daou**, B.E., Mechanical Engineering, 2000, Notre Dame University (Lebanon), Laboratory Instructor.

2.4 Full-Time Non Academics

- **Maroun Eid**, Laboratory Technician.
- **Ghada Khoury**, Secretary.

2.5 Promotions & Faculty Development

- Dr. Marwan Azzi will join the ME Department as assistant professor starting October 1, 2010.

Dr. M. Azzi received his B.E. in Mechanical Engineering from the Lebanese University (Lebanon) in 1997, his M.S. in Materials Science and Engineering from Ecole Centrale de Paris (France) in 2002, and his Ph.D. in Materials Engineering from McGill University (Canada) in 2008. He moved then to Ecole Polytechnique de Montreal (Canada) as PostDoc scholar. Dr. Azzi is active in the field of new materials with enhanced tribological and corrosion properties for aerospace and biomedical applications and is regularly publishing in refereed journals and conference proceedings.

- Dr. Charbel Bou Mosleh has been appointed Visiting Assistant Professor in the Aeronautics and Astronautics Department at Stanford University and as such he is leading research projects at Stanford this summer 2010 for the US Army High Performance Computing Research Center Summer Institute.

3. Research & Publications

All ME faculty members are involved in research and publications to various extents. The different fields of research are related to the areas of interest as listed under Personnel section. The following items deserve special mention:

- The Department is contributing to the project of establishing a joint research unit between NDU and the Lebanese University in the area of energy harnessing and harvesting. Two faculty members, M. Hayek, principal investigator, and Ch. Bou Mosleh, co-investigator, are involved in the project.
- A collaboration link has been established with Stanford University through the efforts of Dr. Charbel Bou Mosleh. Currently, the collaboration is limited to faculty exchanges. The department is actively investigating the possibility of establishing collaborative research programs in which NDU faculty members may contribute, especially in the area of computational engineering.
- The collaboration link with the University of Tennessee Space Institute is continuing. One additional ME graduate have joined UTSI this summer 2010 in order to pursue a master degree with full scholarship.

The following papers were published by ME Faculty during the academic year 2009-2010. All publications are in refereed journals and international conferences.

1. F. Francis, Sustainable Engineering – A Focus on Green Product Design, International Journal of Theoretical and Applied Mechanics, Vol.5, pp. 159-170, 2010.
2. F. Francis, Electrochemical Machining of Ferrous and Non-Ferrous Alloys, Steel Grips, pp. 200-203, 2010.
3. N. Metni, Sensor Fusion for Attitude and Bias Estimation for a VTOLUAV, Proceedings of the ASME2010 10th Biennial Conference on Engineering Systems Design and Analysis (ESDA2010), Istanbul, Turkey, July 2010.
4. N. Metni, Asservissement visuel des engins volants à voilures tournantes, Editions Universitaires Européennes, June 2010, ISBN : 978-613-1-50555-3
5. T. Jabbour, G. Asmar, “Stress Calculation for Helical Plastic Gears under Real Transverse contact Ratio”, Mechanism and Machine Theory, 44 (12), pp.2236-2247, 2009.
6. G. Asmar, E. Chakar, Stress Analysis of an Isotropic Plate Containing Three Aligned Circular Holes under In-Plane Symmetric Loading, Proceedings of the 10th Biennial ASME Conference on Engineering Systems Design and Analysis, Istanbul, Turkey, 2010.
7. E. Chakar, G. Asmar, Resonant Mode Suppression in a Vibratory System: Application to Earthquake Engineering, 16th International Scientific Conference, Beirut Arab University, Beirut, Lebanon, 2009.

Furthermore, most full-time faculty members of the department are involved in reviewing activities for local institutions and international journals and conferences.

4. Committees & Services

All full-time faculty members were involved in a way or another in committee works at all levels, from the departmental level up to the university level.

4.1 Departmental Level

The department control bodies are made of the following three committees with their composition:

- Department Personnel Committee: Dr. M. El Hayek (Chairperson), Dr. W. Assaf, Dr. G. Asmar, Dr. F. Francis, Dr. N. Metni (Secretary).
- Department Curriculum Committee: Dr. M. El Hayek (Chairperson), Dr. W. Assaf, Dr. G. Asmar, Dr. F. Francis, and Dr. N. Metni (Secretary), Dr. Ch. Bou Mosleh.
- Department Outcome Assessment Committee: Dr. N. Metni (Chairperson), Dr. W. Assaf, Dr. G. Asmar, Dr. F. Francis, and Dr. Ch. Bou Mosleh (Secretary).

Various meetings were organized throughout the academic year for which minutes were issued and archived in the department files.

4.2 Faculty Level

The department contributes to the control bodies of the faculty as following:

- Council of Chairpersons: Dr. M. El Hayek.
- Faculty Personnel Committee: Dr. M. El Hayek
- Faculty Curriculum Committee: Dr. F. Francis.

4.3 University Level

The department contribution to university-level committees is as follows:

- Accreditation Steering Committee: Dr. M. El Hayek.
- Academic Steering Committee: Dr. F. Francis & Dr. N. Metni.
- Faculty Concern Committee: Dr. G. Asmar

4.4 Community Services

Besides committee works, the ME faculty members are well known for their commitment and continued services to ME students and to the entire NDU community in general. In fact, two student branches of learning societies are operating within the mechanical engineering department, namely, the ASME Students Branch, advised by Dr. G. Asmar, and the ASHRAE Students Branch, advised by Dr. M. El Hayek. Beyond that, Dr. M. El Hayek is also the advisor of a major student club operating at a university scale.

5. Academics

5.1 Statistics

The overall performance of the department from an academic point of view is shown in the following tables.

5.1.1 Courses Offered & Results

	Fall 2009	Spring 2010	
3-Credit Courses	Number of Sections	29	28
	Average Class Size	26.93	31.39
	Average GPA	2.33	2.38
1-Credit Courses	Number of Sections	8	8
	Average Class Size	14.63	15.0
	Average GPA	3.01	3.1
Eng. Design I (1 cr.)	Number of Sections	5	6
	Average Class Size	4.6	4.33
	Average GPA	3.91	3.82
Eng. Design II (2 cr.)	Number of Sections	2	5
	Average Class Size	4.0	4.6
	Average GPA	4.0	3.97

5.1.2 Teaching Load (in mechanical engineering only – credits taught in other departments / campuses are not included)

	Summer 2008	Fall 2008	Spring 2009
W. Assaf	5.5	10	8
M. El Hayek	3	7.33	8.67
G. Asmar	3	10	12
F. Francis	5.67	13	11
N. Metni	6.93	15	9
Ch. Bou Mosleh	0	12	13
W. Daou	1	4	4
Total Full-Time	25.1	71.33	65.67
A. Hammoud	6	6	9
T. Jabbour	2	2	2
Ch. Azoury	0	5	5
S. Matar	0	9	9
G. Challita	0	6	9
J.-P. Daghfal	0	3	6
Total Part-Time	8	31	41
Total	33.1	102.33	106.67

5.1.3 Courses Taught (in mechanical engineering / main campus only – courses taught in other departments / campuses are not included)

	Summer 2008	Fall 2008	Spring 2009
W. Assaf	MEN210, MEN460	MEN210, MEN211, MEN517, MEN598	MEN211, MEN510, MEN598, MEN599
M. El Hayek	MEN460	MEN310, MEN520, MEN598, MEN599	MEN310(2), MEN598, MEN599
G. Asmar	MEN460	MEN302(2), MEN503, MEN598	MEN302(2), MEN507, MEN598, MEN599
F. Francis	MEN399, MEN460	MEN200, MEN201(2), MEN340, MEN598	MEN201, MEN340, MEN534. MEN598, MEN599
N. Metni	MEN399, MEN460, MEN598	MEN401, MEN435, MEN437, MEN540, MEN598, MEN599	MEN401, MEN435, MEN598, MEN599
Ch. Bou Mosleh		MEN210(2), MEN321(2)	MEN210(3), MEN321, MEN598
W. Daou	MEN431	MEN376(2), MEN431(2)	MEN376(2), MEN431(2)
A. Hammoud	MEN320, MEN515	MEN320(2)	MEN320(2), MEN515
T. Jabbour	MEN270, MEN370	MEN370(2)	MEN370(2)
Ch. Azoury		MEN270(2), ENG310	MEN201, MEN270(2)
S. Matar		MEN202, MEN410, MEN430	MEN201, MEN202, MEN430
G. Challita		MEN330, MEN440	MEN330, MEN437, MEN440
J.-P. Daghfal		MEN202,	MEN200, MEN202

5.1.3 Advising Load (enrolled students only)

	Fall 2008	Spring 2009
W. Assaf	61	58
M. El Hayek	105	113
G. Asmar	59	52
F. Francis	73	68
N Metni	23	24
Total	321	315

5.2 Curriculum Development

Various proposals to upgrade the ME program were developed and approved by the Department Curriculum Committee and all higher level committees (Faculty Curriculum Committee, University Curriculum Committee, ...).

- Remove MEN 440, Computer-Aided Design & Manufacturing, 3cr.
- Add MAT 326, Probability and Statistics for Engineers, 3cr, as a core course.
- Add MEN 544 to the pool of technical electives:

MEN 544 Computer-Aided Manufacturing (3.0); 3 cr. Fundamentals of industrial automation; numerical control (NC) systems; part programming; robotics in manufacturing; materials handling and automated storage systems; group technology; automated identification and inspection systems; flexible manufacturing systems. *Prerequisites:* MEN 340, MEN 370.

- Update the pre-requisites/co-requisites of MEN 310.
- Update course description & pre-requisites of MEN 580:

MEN 580 Finite Elements Methods (3.0); 3 cr. The concepts and fundamentals of the finite element method with applications to problems in solid mechanics, fluid mechanics, and heat transfer. *Prerequisites:* MEN 302, MEN 310.

Such changes are an additional milestone in the process of upgrading the ME program started in 2008 and applicable to ID#2008 and beyond. The process is to continue the next academic year with the main objective of making the ME Program at NDU of an international status according to the standards in the field (ABET, ...)

A new master in mechanical engineering program has been developed and approved by the ME Curriculum Committee. The program involves a balance between required and elective courses plus a 9-credit thesis course. The proposal is being investigated at upper levels.

5.3. Senior Projects

The following senior projects were successfully presented during the academic year 2009-2010 and copies of the corresponding reports were forwarded to the central library for archiving.

5.3.1 Summer 2009

Senior Project	Prepared by	Advised by
Jardon: The Pipe Inspector Map Generator	Alain Achkar & Antoine Saad	Dr. N. Metni
Stress Analysis and Heat Transfer for a Pipe in a Heat Exchanger	Chadi El Hajj & Wissam Hajj.	Dr. G. Asmar

5.3.2 Fall 2009

Senior Project	Prepared by	Advised by
Mechanical Design for Ajaltoun Villa: Heating, Cooling, Pipe Size, Duct Size	Lahoud Habchi, Georges Sfeir	Dr. W. Assaf
Predicting Turbulence and Heat Transfer using LES k-e and g-x	Charles Haddad	Dr. M. Hayek
Design of an Experimental Solar Absorption Chiller	Jessica Ghobril, Camil Fares, Jean Chemaly	Dr. M. Hayek
CNC Router	Rabih Jenadri, Arz Tawk, Robert Mousallem	Dr. F. Francis
The On-Site Glass Bottle Crusher	Charbel El Khazen, Roy Azzam	Dr. N. Metni
Fire Fighting Robot	Elias Yasmine, Maroun Sayah	Dr. N. Metni
System Identification & Trajectory tracking for a DC Motor	Sabine El Hachem, Roy Bader	Dr. N. Metni
WRA 540: The Writing Robotic Arm	Joy Mtanios-Abdallah, Khajag Garabedian, Georges Khairallah	Dr. N. Metni

5.3.3 Spring 2010

Senior Project	Prepared by	Advised by
Four Point Sheraton Hotel: Air-Conditioning & Water Distribution	Hany Berkachy & Elie Zayat	Dr. W. Assaf
Evacuated Tube Solar Collectors: Testing, Analysis and Design	Johnny Assaf & William Lteif	Dr. M. Hayek

HVAC & Water Distribution of a Medical Center	Elias Abi Raad & Jad Azar	Dr. M. Hayek
Vertical Axis Wind Turbine: Design and Testing	Francois Sfeir, Abdallah AouKasm & Elie Salameh	Dr. M. Hayek
Automated Shotgun Shell Reloader	Ghadi Khalil, Michel Reaidi & Shebel Saghbini	Dr. G. Asmar
Solar Powered Car	Antoine Elias, Roni Choueifati & Abdo Zeinoun	Dr. G. Asmar
Control of Vibration of a Cantilever Beam	Bechara Sfeir	Dr. N. Metni
Active Leveling Control	Rami Rouhana & Elie Aoun	Dr. N. Metni
Automated Oil Quality Measurement System	Sabeh Daou & Ziad El Khoury	Dr. N. Metni
Experimental Quadrator Platform	Michel Aoun, Michel Bejjani & Francois Ghanem	Dr. N. Metni

5.4. Practical Training

A total of 42 students did register in MEN 399, Practical Training in Mechanical Engineering, in summer 2009. 9 students went to the Gulf region to carry out their training and 1 to the USA. The remaining students were distributed among local industrial partners like Mercedes Benz (6 students), Indevco (5 students), Technica (3 students), Contra international (3 students), ... Students' testimonies were published in NDU Spirit, Is.47, and reflect the positive impact the training is having on ME students in general.

6. Department Activities

Several activities were organized by the department during the academic year 2009-2010, especially by students clubs and local branches of professional societies. The major events are listed here for information:

- The department did actively participate in the organization of the International Conference on Advances in Computational Tools for Engineering Applications (ACTEA09), which was held at NDU from July 14 to July 17, 2009. Six papers, from the department, were accepted and presented at the conference.
- Presentation by Dr. Sanjeev Jain, ASHRAE Distinguished Lecturer, Indian Institute of Technology, entitled "Renewable & Low Energy Driven Cooling Technologies for a Greener Tomorrow" on Thursday, November 19, 2009, organized by the ASHARE student section in collaboration with the Lebanese ASHRAE Chapter.

- Presentation by Dr. Marwan Azzi, Ecole Polytechnique de Montreal (Canada), entitled “Materials Degradation by Corrosion and Wear & Surface Engineering” on Wednesday, December 16, 2009, organized by the ASME & ASHARE student sections.
- Series of presentations (three) by Dr. Najib Metni about LabVIEW, Spring 2010, Organized by the ASME student section.
- Presentation by Dr. Charbel Bou Mosleh entitled “CFD-Based Aerodynamic and Aeroelastic Analysis of a Formula 1 Car” on Monday, March 1, 2010, Organized by the ASHRAE student section.
- Presentation by Mr. Jiwen Jiao, Beijing Tsinghua Solar Co. (China), entitled “Heat Pipe Technology & Solar Water Heating” on Tuesday, March 23, 2010, organized by the ASHARE student section in collaboration with the Lebanese Center for Energy Conservation.
- The 2nd Student Professional Development Conference of the ASME District J (Middle East and Africa) was organized from May 7 to May 8, 2010, by the local ASME Student Branch at NDU with the help of the local ASHRAE Student Branch and other Lebanese ASME student branches (AUB and LAU).
- Presentation by D Dr. Tom Lawrence, ASHRAE Distinguished Lecturer and Chair of the ASHRAE Technical Committee TC8.2, entitled “ASHRAE Standard 189.1 & Green Buildings” on Wednesday, June 02, 2010, organized by the ASHARE student section in collaboration with the Lebanese ASHRAE Chapter.

7. Students

7.1 Statistics

The overall performance of the department from a students point of view is shown in the following tables.

7.1.1 Student Enrollment

	Fall 2009	Spring 2010
Year 1	119	80
Year 2	64	78
Year 3	80	76
Year 4	46	48
Year 5	12	33
Total	321	315

7.1.2 Graduates (see Appendix A for complete lists)

	Summer 2009	Fall 2009	Spring 2010
Total	7	16	31

7.1.3 *New Students* (accepted and enrolled including transfer students)

	Fall 2009	Spring 2010
New	39	6
Transfer	14	12
Total	53	18

7.2. Students' Excellence

Many ME students are excelling at various levels both academic and social. The following students deserve special mention:

- Charles Haddad has been elected chair of the Student District Operating Board of the ASME worldwide. As such, he is regularly invited to participate in meetings and student conferences in the US. He has been also accepted to follow a master degree at UTSI with full scholarship.
- Mireille Hantouche participated in the Old Guard Oral Competition of the 2010 ASME District J's SPDC and won the first place. As such she will be competing in a similar competition against winners of other districts. The international competition is to be held in November 2010 in the USA.
- Pierrot Antoun participated in the Mechatronics Competition of the 2010 ASME District J's SPDC and won the first place.
- PETROFAC did organize in May 2010, and for the first time at NDU, its hiring tests. Around 30 students (ME & EE) attended the test and 13 of them were selected after many tests and interviews, and given offers to join PETROFAC in October 2010.

Many ME graduates were accepted at AUB and abroad to follow a master degrees and are performing very well according to the feedbacks the department is collecting from various sources.

8. Equipments & Facilities

State of the art laboratory equipments are being used in the department in order to train students on various practical issues related to mechanical engineering. The list is being expanded on regular basis and a proposal to acquire a mechatronics/control laboratory set has been submitted. The set includes 6 training units (ELVIS II by NI) with their accessories and a full college license to use the LabVIEW software.

More equipment are being added on regular basis. Expected equipments in the near future include manufacturing laboratory set and additional equipment to expand the instrumentation set available in the department..

Parallel to the state-of-the-art laboratory equipments, the department is planning to enhance its expertise in terms of computational activities related to the various fields of mechanical engineering. To that end, engineering and scientific software are needed and the department has started a process of acquiring state-of-the-art computational tools. The first on the list is a finite-element package, namely NSTRAN and its associated tools like MARC, DYTRAN, PATRAN, etc... A university license (150 users) is being used for the second year. Next on the list are a CFD software and a CAD (CAM) software.

9. Future Plans

The past academic year saw a boost in the department activities, especially at students' level. Further progress is still needed and several plans are being considered in order to improve the overall performance of the department in meeting students' and market needs.

- Expansion of the laboratories to includes new tools and systems that can be used to operate a set of new laboratory courses. On top of the list are equipments to operate a manufacturing laboratory (set of machines tools for student training). Such an expansion will push the ME laboratories at NDU among the best in the country for ME education and training.
- Development of computational facilities by acquiring both the hardware and software required. Such facilities may be used to create a kind of computational research center whose main goal may be to serve both NDU users and the local industry in term of computational expertise.

To achieve those goals and to sustain possible expansion, additional faculty members may be needed in a near future. The capacity of the department to add new faculty members is rather large taking into account the non-negligible percentage of services being fulfilled by part-time faculty (see section 5, Academics, for more details).

Appendix A: ME Graduates 2009-2010

Summer 2009

ID #	Name	GPA
2005-1751	Ralph Antoine DAOU	3.09
2003-1582	Chadi Toni EL HAGE	2.26
2003-2711	Elie Walid EL KHOURY	2.30
2004-1208	Simon Boutros KASSIS	2.82
2005-1746	Joe Youssef LATTOUF	3.34
2004-1070	Antoine Elie SAAD	3.23
2004-6564	Nadim Abdallah SAIFEDDINE	2.22

Fall 2009

ID #	Name	GPA
2005-1515	Alain Adel ACHKAR	3.59
2005-1752	Roy Elias BADER	3.30
2003-3212	Anthony Elie CHALHOUB	2.00
2003-1781	Wissam Fares HAJJ	2.14
2005-1399	Charbel Gerges KHAZEN EL	2.78
2005-2013	Camille Rizk FARES	3.17
2005-2060	Jessica Jean GHOBRIEL	3.39
2003-1665	Lahoud Toni HABCHI	2.15
2005-1051	Charles Toufic HADDAD	3.95
2004-6829	Rabih Antoine JENDARI	2.61
2004-6589	Elie Antoine KARAM	3.05
2004-6624	Joseph Maroun KARAM	2.28
2005-1425	Georges Carlos KHAIRALLAH	3.64
2005-1108	Joy William MTANIOS-ABDALLAH	3.70
2005-1219	Maroun Elias SAYAH	3.11
2004-1523	Georges Nicolas SFEIR	2.66

Spring 2010

ID #	Name	GPA
2003-1563	Elias Jean ABI RAAD	2.04
2004-1635	Ralph Antoine ABI TAYEH	2.35
2006-0020	Abdallah Ibrahim ABOU KASM	3.43

2005-3486	Elie George AOUN	3.71
2005-1018	Michel Gebrael AOUN	3.66
2005-1318	Johnny Attieh ASSAF	2.54
2003-1560	Jad Charbel AZAR	2.11
2005-1309	Roy Michel AZZAM	2.46
2005-1524	Michel Jean BEJJANI	2.99
2005-1689	Hany Tony BERKACHY	2.17
2005-1773	Jean Joseph CHEMALY	2.77
2005-1692	Rony Elie CHOUEIFATY	3.00
2005-1022	Sabeh Walid DAOU	3.68
2005-1729	Sabine Hicham EL HACHEM	3.36
2005-1202	Ziad Georges EL KHOURY	2.91
2005-2253	Antoine Akl ELIAS	3.14
2005-1579	Khajag Levon GARABEDIAN	3.72
2005-1397	Francois Farid GHANEM	2.55
2005-1455	Ghadi Antoine KHALIL	2.66
2003-2751	William Chahin LTEIF	2.16
2004-1495	Robert Melhem MOUSSALLEM	2.22
2004-1277	Joseph Souhail NAJEM	2.09
2004-6686	Michel Bechara REAIDI	2.36
2005-1368	Rami Georges ROUHANA	3.03
2005-1402	Shebel Jamal SAGHBINI	2.75
2006-0565	Elie Rizkallah SALAMEH	3.86
2004-6925	Bechara Nader SFEIR	2.31
2006-0364	Francois Gebrael SFEIR	2.66
2005-1842	Arz Anwar TAWK	2.27
2005-2085	Elia Costa YASMINE	2.75
2004-6578	Elie Georges ZAYAT	2.04