



The PhD Program in Mechanical Engineering

Mechanical Engineering Department and Graduate Programs

The Mechanical Engineering Department is one of four departments in the Faculty of Engineering and Architecture. The department offers one graduate program leading to Master of Engineering in Mechanical Engineering. A PhD program in mechanical engineering will be offered in October 2007 and will provide the environment to sustain long term commitment to research and the advancement of knowledge.

PhD Program Objectives

The graduate curriculum offers students opportunities to develop levels of expertise and knowledge consistent with a career of technical leadership. The doctoral program emphasizes the acquisition of advanced knowledge and the fostering of individual experience of significant intellectual exploration. The educational objectives of the PhD program are to

1. Develop expertise in a core area of mechanical engineering;
2. Develop the ability to identify pertinent research problems, formulate and execute a research plan, and generate and analyze original research results;
3. Develop the ability to communicate those results through oral presentations and written publications;
4. Develop the practice of independent learning and advancing knowledge.

PhD Program Requirements

The PhD program in Mechanical Engineering requires a minimum of 18 credit hours of course work beyond the master's degree. The student is expected to pass a two part PhD Qualification Examination. In addition, the student is expected to complete an original dissertation based on independent research that makes a significant contribution in his/her area of research. The thesis is the principal component of the doctoral program, and the part that will serve as the major indicator of a candidate's abilities. A minimum of 30 credits registered as thesis work is required.

Admissions

Candidates for the doctoral degree program are expected to have an outstanding academic record demonstrated by a minimum undergraduate cumulative grade average of 80.0 according to AUB standards (3.0 GPA in a 4.0 grade system) and have completed a master's degree in mechanical engineering or a related discipline with a cumulative grade average of 85.0 according to AUB standards (3.33 GPA in a 4.0 grade system). Admission is determined by evaluating the following:

- Transcripts of academic record from the institution(s) of higher education attended by the applicant.
- Graduate Record Examination (GRE) general test scores
- A written statement of purpose
- Three letters of recommendations
- A portfolio that includes a resume and samples of work

The application to the doctoral program will follow the deadlines set by the Admissions Office. Students other than AUB graduates and graduates of recognized colleges or universities in North America, Great Britain, Australia, and New Zealand are required to take the Test of English as a Foreign Language (TOEFL) and receive a minimum score of 600 if taken manually, or 250 if taken via computer. The University's requirements for graduate students may be found under 'Catalogue' at <http://www.aub.edu.lb/~webregist/>. The application form may be obtained from the Admissions Office, or on line at <http://www.aub.edu.lb/~webadmit/>.

Financial Support

Three types of financial assistance to graduate students are available: fellowships, graduate research assistantships (GRA), and graduate teaching assistantships (GA). A fellowship provides the student with direct support and full tuition waiver. GRAs are appointments to work on particular research projects with particular faculty members who support these students from their external research funding. GAs are teaching appointments that cover full tuition and stipend.



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Faculty Research Interests

The research of faculty members spans the areas of thermal fluid sciences, materials and manufacturing, and mechatronics. The faculty members and their research thrusts are

Samer Abdallah

Assistant Professor. PhD from University of Sydney, Australia (2001)

Robotics, computer vision, medical image analysis, advanced design, dynamic systems and control systems.

Marwan Darwish

Professor, PhD from Brunel University at UK (1991)

Computational fluid dynamics, solidification, and materials.

Nesreen Ghaddar

Endowed Qatar Chair in Energy Studies, Professor and Chairperson, Fellow of ASME.

PhD from Massachusetts Institute of Technology (1985).

Heat and moisture transport in thermal systems, ventilation models of active people, bioheat modeling, thermal comfort, optimization of HVAC control strategies, energy efficiency, and renewable energy applications.

Ramsey Hamade

Associate Professor, PhD from Virginia Polytechnic Institute (1988)

Durability of adhesive joints: experimentation and simulations, cutting processes: mechanics and experimentation, computer aided design: knowledge acquisition and intelligent CAD, Integrated design and manufacturing.

Kinda Khalaf

Assistant Professor. PhD from

Ohio State University (1997)

Orthopedic biomechanics, computational biomechanics, robotics, imaging techniques, biological systems modeling and control, and biomedical devices and biomaterials.

Issam Lakkis

Assistant Professor. PhD from Massachusetts Institute of Technology (2000)

High resolution grid-free computational methods in fluid mechanics and molecular dynamics. Analysis and design of Micro-Electromechanical Systems with focus on system-level modeling in micro-fluidics and BioMEMS.

Fadl Moukalled

Professor, Associate Dean for Academic affairs, and Fellow of the Center for Advanced Mathematical Studies at AUB. PhD from Louisiana State

University (1987)

Computational Fluid Dynamics (CFD), turbulent and single multiphase flow, mixing and evaporation, heat and mass transfer, and fluid flow at all speeds.

Ghanem Oweis

Assistant Professor. PhD from University of Michigan (2004)

Experimental fluid mechanics and laser diagnostics. Aerodynamics, hydrodynamics, and biofluidics.

Alan Shihadeh

Associate Professor. ScD from Massachusetts Institute of Technology (1998)

Use and development of instrumentation and experimental techniques for the thermal-fluid sciences, with emphasis on applications in combustion, air pollution, and aerosol dynamics.

Resources

ME Laboratories

The ME laboratories represent the infrastructure for all experimental and numerical research in the department. State-of-the-art equipment and software have been installed and operate to give students and researchers the opportunity to work with accurate experimentations and real time simulations. Currently, the major labs are:

- Aerosol Dynamics Laboratory
- Bioengineering Laboratory
- Computational Fluid Dynamics/Mechanics Laboratory.
- Computer Vision Laboratory
- Fluid Mechanics Laboratory
- Heat transfer and Air conditioning Laboratory
- Manufacturing Laboratory
- Materials and Material Characterization Laboratory
- Mechatronics Laboratory

Engineering Shops

The major shop facilities include: the wood shop, the metal joining shop, and the metal processing shop. The shops are open to all students at anytime and are operated by a team of highly qualified personnel to ensure both the excellence of the job performed and the safety of the students. The shops, equipped with advanced machining equipment, are well maintained and are periodically upgraded. Most of the needs of the FEA research projects are done in house with a quality and precision that cannot be matched elsewhere in Lebanon.

For more information, visit:

<http://webfea.fea.aub.edu.lb/fea/med/>