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## COLLEGE OF ENGINEERING

Masters Programs in

COMPUTER AND  
INFORMATION SCIENCE

&

INDUSTRIAL ENGINEERING AND  
SYSTEMS MANAGEMENT

Yerevan  
Republic of Armenia  
2004

[www.aua.am](http://www.aua.am)  
[www.aua-mirror.com](http://www.aua-mirror.com)

## General Information

The College of Engineering of the AUA offers two masters programs:

1. Master of Engineering in Industrial Engineering & Systems Management (M.Eng. IESM), and
2. Master of Science in Computer and Information Science (M.S. CIS).

The IESM program is designed to provide a broad-based education in the areas of industrial and operations management, production systems, IT and communications. The CIS program is designed to provide broad-based training in the technical areas of IT, as well as in business, management and entrepreneurship. More specific information about these programs and the lists of program courses are given later in this brochure.

Both IESM and CIS programs draw upon the expertise of local as well as visiting faculty from abroad. The faculty are involved in both teaching and applied research, and they bring many years of expertise to the classroom. Many of the faculty have made significant contributions to the advancement of scientific and engineering knowledge, hold important positions in professional societies, serve as consultants and advisors to industry and government, and have earned national and international recognition. Each program is overseen by an Advisory Board composed of prominent representatives from industry and academia in Armenia and the USA.

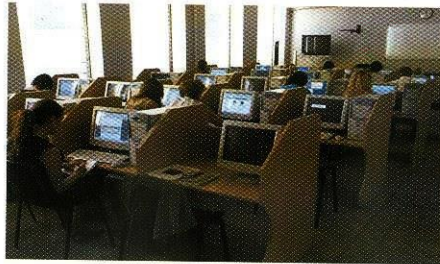
The computer facilities of the College are state-of-the-art and are connected to the Internet, as well as a local area network. All students are given computer accounts and free access to the Internet. The computer facilities support a large number of educational and professional software. A CAD/CAM lab with a Programmable Multi-Axes Controller (PMAC) system and an ECP Industrial Motion Control Emulator Unit are available for use by IESM students. The AUA library subscribes to many digital libraries worldwide. Course materials and textbooks are provided free by the university.

Both IESM and CIS programs commence in the spring quarter and require 5 or 6 quarters of study, each quarter consisting of 10 weeks of classes. Students are required to submit a Masters Thesis or Project as a culminating experience of their study programs. Tuition fee for foreign students is US \$6,000 per year, or US \$2,000 per quarter. A limited number of fellowships and financial aid grants are available for qualifying applicants.

AUA is a Candidate of Accreditation by the Western Association of Schools and Colleges in the United States. We are expected to receive our full accreditation within two years.

### Why you should consider studying at AUA

Through its affiliation with the University of California, AUA is able to provide American style graduate education at a fraction of the cost of attending universities in the United States. All classroom instruction is in English and textbooks are the same as those used at top universities in the United States. AUA hosts visiting professors from USA, as well as from UK, India, Hong Kong and other countries. This diversity of faculty backgrounds provides a unique multicultural educational environment, which helps develop an international outlook in study, research and future career. Relations developed with the international faculty have lasting importance for career development and further study.



As a hallmark of the American graduate educational approach, the programs of study in the College emphasize a hands-on and interactive approach with many opportunities for real-life projects, practicum and research. Linkages with industry are established during the course of study through field trips and internships. Additional opportunities are available to work as research or teaching assistants. These opportunities provide valuable experience for career development.

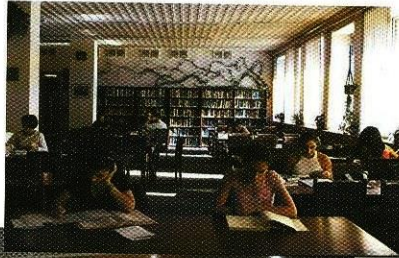
Finally, Yerevan offers a culturally and socially rich environment with a cost of living that is far below that of many comparable cities.

**The College of Engineering maintains a web site specially designed to address the needs of international students.** Prospective students can obtain all the necessary information about studying at AUA and the conditions of living in Armenia, as well as useful information for transitioning to living in Armenia at [www.aua.am/aua/masters/ce/internationalstudents/index2.htm](http://www.aua.am/aua/masters/ce/internationalstudents/index2.htm).

### **AUA Services:**

In addition to its academic programs, AUA offers the following services to its students, faculty and staff:

1. A Health Clinic for consultation on health issues.
2. An Alumni Center, which provides a list of jobs and organizes meetings with potential employers.
3. Assistance in renting apartments in Yerevan (provides a list of apartments available in the city).
4. A library open to the general public.
5. A cafeteria provides quality food at affordable prices.



*"Attending AUA has helped me to be confident, assured and risky, because I know I have solid knowledge."*

AUA graduate



### **General Admission Requirements**

Two paths are available for admission into the degree programs of the College of Engineering at AUA:

1. *Direct application (deadline is second Friday of December)* - This path is for those applicants, who have all the required standardized test scores at the time of application. The applicant should hold:

- A certified degree from a 4-year or 5-year program of an accredited institution for higher education.
- An official TOEFL (Test of English as a Foreign Language) examination score.
- An official GRE (Graduate Record Examination) score.

Admission is based on an evaluation of the entire transcript of the undergraduate degree and TOEFL and GRE scores. For direct applicants, normally a TOEFL score of 570 or more is required.

2. Application Through the Intensive Preparatory Program (deadline is usually in April) – This path is for those applicants who do not have the required TOEFL and GRE test scores at the time of application. The applicant should hold:

- A certified degree from a 4-year or 5-year program of an accredited institution for higher education.
- Minimum required proficiency in the English language, as evidenced by an entrance test administered by the University.

These applicants are first admitted into a preparatory program consisting of intensive English and computer application courses during the period from May to November of the year of application. Admission to the degree program is dependent on the scores achieved in TOEFL and GRE tests taken at the end of the preparatory courses.

In addition to the above requirements, each degree program has its own special requirements, as described below.

## **The CIS Program**

The AUA Computer and Information Science (CIS) program is an applied program to help students gain the necessary skills requisite to being productive leaders of the computing and related industries in Armenia and its region. As such, the students receive broad training in the technical areas of the field, as well as in business, management and entrepreneurship. The program offers minors in Business and Management (BM) or Industrial Engineering and Systems Management (IESM).

A key feature of the program provides students with an opportunity to gain “real world” experience by completing a project in industry or a government agency. This opportunity helps students to apply their knowledge, as well as understand the social and cultural aspects of the field in which they are working.

CIS bridge courses include: *Programming in C++ and Java, Data Structures and Algorithms, Discrete Mathematical Structures, Computer Organization & Assembly Language.*

CIS masters level courses include: *Theory of Algorithms, Operating System Principles, Computer Architecture, Database Systems, Software Engineering, Software Project Management, Internet Application - Design and Development, Software Architecture, Entrepreneurship, etc.*

## **The Opportunities**

Graduates of the CIS program have established themselves in several areas. They have formed new ventures based on work completed during their graduate studies. They have also leveraged their graduate work to obtain positions in international organizations, as well as in the local industry.

During their graduate studies, students have developed Open Source projects. A good example of this is the Visual Software Circuit Board developed by AUA students under the direction of Hovhannes Avoyan, Managing Director, Lycos Europe. These project contributions have resulted in international recognition via publications both on the internet and in conferences.

## **CIS Admission Requirements**

The CIS program is open to students with an undergraduate degree in fields including mathematics, science and engineering. Students with degrees in non-science disciplines may be admitted, depending on their completed course work. The undergraduate degree must include, as a minimum, two years of college-level mathematics covering calculus, linear algebra and differential equations, and a course in physical sciences (physics, mechanics, chemistry, biology, etc).

All prospective CIS graduate students who do not possess a B.Sc. degree in Computer Science must either:

- successfully complete the bridge courses (listed above) or
- satisfactorily pass the final comprehensive exams (waiver exams) for the aforementioned courses.

## The IESM Program

The Industrial Engineering & Systems Management (IESM) Program at the American University of Armenia (AUA) is a two-year, broad-based program that provides students the opportunity to develop and enrich their quantitative analysis, computer/systems skills, and applied management knowledge through a variety of courses and project-based individual study. The program offers minors in Business and Management (BM) or Computer and Information Science (CIS).

The IESM program offers innovative curricula that prepare a student to address the evolving analytic and managerial needs of organizations in both private and public sectors. It is designed to prepare graduates to work in manufacturing as well as service industries. The coursework addresses such topics as industrial and operations management, facility planning and design, decision support and information systems, production control, economic analysis, quality engineering and management, reliability, modern manufacturing methods, computer integrated manufacturing, systems evaluation, applied operations research, and industrial and commercial data systems.

Classroom instruction is supplemented with extensive computer applications and field trips to various service centers and manufacturing facilities in Armenia.

Under the supervision of faculty, students actively participate in applied research projects within the Engineering Research Center.

IESM course list includes: *Engineering economics, Analysis and Design of Data Systems, Linear programming, Operations research, Production system analysis, Decision analysis, Quality assurance and management, Computer-aided design, etc.*

## The Opportunities

Graduates of the IESM program play key roles in the ongoing transformation of the Armenian industrial sector, as well as in the emerging private enterprises in manufacturing and service sectors of Armenia and its region.

A good example is a student team project that led to the restructuring of operations at a major jewelry company in Armenia, resulting in considerable reduction of material loss. The team was employed at this business as a result of the project.

The IESM graduates normally begin their careers in technical or business positions, but many later shift to managerial positions. Graduates of the program have found employment in the service, industrial, government, and consulting sectors in Armenia, as well as in foreign educational, industrial and consulting entities.

## IESM Admission Requirements

The Industrial Engineering and Systems Management program is open to students with an undergraduate degree in fields including mathematics, science, engineering or economics. Students with degrees in non-science disciplines may be admitted, depending on their completed course work. The undergraduate degree must include, as a minimum, two years of college-level mathematics covering calculus, linear algebra and differential equations, and a course in physical sciences (physics, mechanics, chemistry, biology, etc).



## The Engineering Research Center

The Engineering Research Center (ERC) is administered by the College of Engineering. Its aim is to conduct basic and applied research on technological problems that are relevant to the industrial and economic development of Armenia and its region. The Center brings together AUA visiting faculty, local scientists and engineers, and AUA students to collaborate on projects that are generated internally or funded by external sponsors. Qualified students are employed as Research Assistants and gain valuable experience working alongside experts, on projects related to their fields of study.

In addition to the CAD/CAM laboratory, ERC operates an Earthquake Simulation Platform with 1-ton capacity, two strong-motion seismographs, a Solar Monitoring Station, and an integrated Solar HVAC system. The latter is a result of scientific cooperation between: AUA; ISE Fraunhofer, Germany; INETI, Portugal; and InterSolarCenter, Russia. Recently ERC has added a 5 kW photovoltaic system, integrated with a 1 kW PEM hydrogen fuel cell - one of the few such systems in the world. A unique base isolation system has been developed and applied to buildings to minimise earthquake damage in Armenia.



Please visit [www.aua.am/aua/research/erc/index.htm](http://www.aua.am/aua/research/erc/index.htm) to see details on some of these projects.

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### Dean:

ARMEN DER KIUREGHIAN, Ph.D. University of Illinois  
Professor, University of California, Berkeley

### Director of the Computer & Information Science Program:

BARRY LEVINE, Ph.D. Oregon State University  
Professor, San Francisco State University

### Director of the Engineering Research Center:

KENELL TOURYAN, Ph.D. Princeton University  
Director of Technology Transfer, National Renewable Energy Laboratory -  
a U.S. Department of Energy National Laboratory.

### Associate Director of the Engineering College and Engineering Research Center:

ARTAK HAMBARIAN, Ph.D. State Engineering University of Armenia

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