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COLLEGE OF ENGINEERING

Masters Programs in

COMPUTER AND
INFORMATION SCIENCE

&

INDUSTRIAL ENGINEERING AND
SYSTEMS MANAGEMENT

Yerevan
Republic of Armenia
2005-2006

www.aua.am

General Information

The CIS program is designed to provide broad-based training in software engineering, e-business and entrepreneurship. The IESM program is designed to provide a broad-based education in the areas of industrial and operations management, production systems, IT and communications. Both programs offer minors in business and management. These programs are overseen by advisory boards composed of prominent representatives from industry and academia, both in Armenia and the United States.

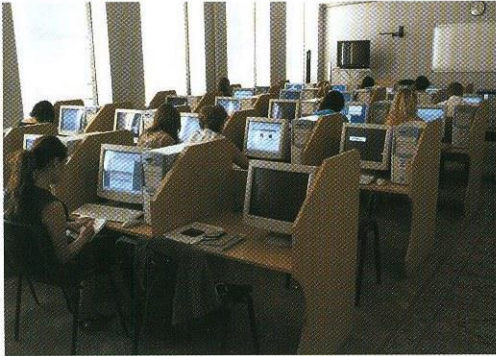
The computer facilities of the College are state-of-the-art, all networked and support a large number of educational and professional software. A dedicated computer lab is available to the CIS students. A CAD/CAM lab with a programmable multi-axes controller and a motion control emulator are available for use by the IESM students.

Both CIS and IESM programs commence in the spring quarter and require 5 or 6 quarters of study, with each quarter consisting of 10 weeks of classes.

Students are required to submit a Masters Thesis as a culminating experience of their study programs.

At the present time, the tuition fee in degree programs at AUA is 3000000 AMD per year, or 1000000 AMD per quarter; for citizens/long-term residents of Armenia and Newly Independent States (NIS) citizens it is 876000 AMD per year (292000 AMD per quarter) and 1750000 AMD per year (583000 AMD per quarter) correspondingly.

The tuition for students in the Intensive Preparatory Program, which consists of training in English language and computer skills, is 1500000 AMD for the entire program. For citizens/long-term residents of Armenia and citizens of NIS it is 368000 AMD and 735000 AMD correspondingly (450 AMD = 1 USD). A limited number of fellowships and financial aid grants are available for qualifying applicants.



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 multi-cultural educational environment, which helps develop an international outlook in study, research and future career. Relations developed with the international faculty have a lasting importance for career development and further study. AUA is a Candidate of Accreditation by the Western Association of Schools and Colleges in the United States. We expect to receive our full accreditation by 2006.

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 at www.aua.am/aua/masters/ce/internationalstudents/index.htm

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 the second Friday of December) – This path is for those applicants who hold:

- a certified degree from a 4-year or 5-year program of an accredited institution for higher education, and
- an official TOEFL score of 570 and more and an official GRE score.

Admission is based on an evaluation of the entire transcript of the undergraduate degree and TOEFL and GRE scores. Prospective CIS applicants should pay attention to the CIS Bridge course requirements described below.

2. *Application through the Intensive Preparatory Program* (deadline is in April) – This path is for applicants who hold

- a certified degree from a 4-year or 5-year program of an accredited institution of higher education,

but do not have the required TOEFL and GRE scores. Admission is based on an evaluation of the entire transcript of the undergraduate degree and a required English proficiency test. If admitted, these applicants must enroll in the Intensive Preparatory Program (IPP) during the period from May to November of the year of application. CIS applicants should in addition enroll in CIS Bridge courses, as described below. Admission to the degree program depends upon the scores achieved in the TOEFL and GRE tests taken at the end of the IPP and, in the case of CIS students, grades in the Bridge courses.

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

The CIS Program

The 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. Courses of instruction include *Theory of Algorithms, Operating System Principles, Computer Architecture, Database Systems, Software Engineering, Software Project Management, Internet Application - Design and Development, Software Architecture, and Entrepreneurship*. A key feature of the program is a *Practicum* course, which provides students with an opportunity to gain real-world experience by completing a project in industry or a government agency. In addition to applying their knowledge, students gain insight into the social and cultural aspects of the field in which they will be working. CIS students are encouraged to do a minor in business management or in IESM. The minor consists of three courses. The CIS Bridge course requirement ensures that students entering the degree program have the requisite background for graduate study in CIS. These courses include: *Programming in C++ and Programming in Java, Data Structures and Algorithms, Discrete Mathematical Structures, and Computer Organization & Assembly Language*.

Highlight: As a part of their graduate studies, several CIS students have developed Open Source projects. One example is the Visual Software Circuit Board developed by four CIS students under the direction of Hovhannes Avoyan, CEO, Sourcio. This project has gained international recognition via publication on the Internet and in conferences.

CIS Specific Admission Requirements

The CIS program is open to students with an undergraduate degree in fields including mathematics, science and engineering. Students with degrees in other 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 CIS Bridge courses (listed above), or
- satisfactorily pass the final comprehensive exams (waiver exams) for the aforementioned courses.

The IESM Program

The IESM program offers innovative curricula that prepare the student for 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. Courses of instruction include *Engineering economics, Applied Probability and Statistics, Linear Programming, Operations Research, Production System Analysis, Analysis and Design of Data Systems, Decision Analysis, Quality Assurance and management, and Computer-Aided Design and Manufacturing*. Classroom instruction is supplemented with extensive computer applications and field trips to various service centers and manufacturing facilities in Armenia. A key feature of the program is an *Integrative Project* course, which is conducted in collaboration with a selected industrial partner and provides a real-world problem solving experience. IESM students are encouraged to do a minor in business management or in CIS. The minor consists of three courses.



Highlight: The IESM graduates normally begin their careers in technical or business positions, but later advance to managerial positions. Many graduates of the program are now in leading positions in the service, industry or government sectors in Armenia, as well as in foreign educational, industrial and consulting entities.

IESM Specific Admission Requirements

The IESM program is open to students with an undergraduate degree in fields including mathematics, science, engineering or economics. Students with degrees in other 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 (ERC)

The 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.

One of the ERC's main research directions is alternative energy and its applications in private/urban uses. The center has performed several projects including those of international importance in the following areas: monitoring of solar radiation, photovoltaic conversion, water heating systems, energy efficient air conditioning and others. As a result of scientific cooperation between AUA, ISE Fraunhofer in Germany, INETI in Portugal and InterSolarCenter in Russia, an integrated Solar HVAC system has been developed. Recently ERC has added a 5 kW photovoltaic system, integrated with a 1 kW PEM hydrogen fuel cell – one of a few such systems in the world.

The other main direction of research is in the area of earthquake engineering, primarily focusing on seismic (base and roof) isolation of buildings and structures. The activities include: development of structural concepts of seismic isolation and earthquake response analysis of isolated buildings using SAP2000, LIRA 9.0 and other computer programs; assessment of seismic hazard for existing buildings using GIS; seismic evaluation of existing buildings; development of guidelines for retrofitting and construction of buildings using seismic isolation; experimental and analytical studies on the behavior of laminated rubber bearings (isolators), reinforced concrete structures, and methods for strengthening of existing structures (e.g., reinforced concrete or steel jacketing, fiber reinforced polymers). For details please visit www.aua.am/aua/research/erc/index.htm



College of Engineering Facilities

CoE operates computer laboratories and rooms fully dedicated for students of each of the two programs. The CAD/CAM laboratory, as an inseparable part of IESM program, is furnished with CNC equipment. The laboratory supports 3 graduate courses *Computer-Aided Design*, *Computer-Aided Manufacturing*, and *Advanced CAD/CAM Applications*. Students use modern engineering software (SolidWorks, COSMOS, Pro/ENGINEER, Pro/MECHANICA) to design and analyze mechanical and structural engineering objects, to create 3D models, convert them to NC programs and manufacture on the CNC machines.



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 solar driven HVAC equipment.

AUA Services:

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

1. A Health Clinic for consultation on health issues.
2. An Alumni Center offering career and recruitment services.
3. Assistance in renting apartments in Yerevan.
4. A library open to the general public.
5. A cafeteria offering quality foods at affordable prices.



"AUA graduates are trained to think openly, diversely, and ready to absorb new suggestions and systems."

Sebough Hatsakordzian, *CIS graduate*

"Attending AUA has helped me to be confident, assured and a risk taker, because I know I have solid knowledge."

Erik Kostandyan, *IESM graduate*

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

VP for R&D, 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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