

**The tentative list of subjects to be taught at the  
«0 139-Actuarial Mathematics»  
Bachelor Degree Program**

<b>General Courses</b>	<b>Professional courses</b>
Armenian Language and Culture of Speech	Mathematical analysis
Russian Language	Linear Algebra
Foreign Language	Analytic Geometry
History of Armenia	Differential Equations
Basics of Political Science	Complex Analysis
Basics of Economics	Theory of Measure
Basics of Law	Equations of Mathematical Physics
Basics of Philosophy	Functional Analysis
Basics of Theology	Theory of Probability
Ecology	Methods of Calculus
History of Art	Practical Statistics
First Aid and Emergency	Theory of Games
Sports	Mathematical Programming
	Discrete Mathematics and Combinatorics
	Extremal Problems
	Analysis of Operations (probabilistic approach)
	Econometrics
	Financial Mathematics
	Stochastic Modeling
	Actuarial Mathematics
	Insurance Theory
	Practical Stochastic Processes
	Informatics
	Software Packages
	Demographic Models
	Financial Markets and Institutions
	Microeconomics
	Macroeconomics
	Investments and Asset Management
	Operational Calculus
	Mathematical Logics
	Accounting and Business Law



**The list of subjects taught at the  
«0 139-Actuarial Mathematics»  
Master Degree Program**

**COURSES TAUGHT IN THE PROGRAM**

**A. General Courses**

1. Foreign Language
2. Informatics and Software Packages
3. Economics
4. Philosophy

**B. General Professional Courses**

1. Probability Theory, Advanced Course
2. Mathematical Statistics and Economics
3. Stochastic Processes
4. Operations Analysis and The Theory of Games
5. Mathematical Programming of Economic Models
6. Theory of Optimal Control and Approximations

**C. Special Professional Courses**

1. Stochastic Modeling
2. Financial Mathematics
3. Essentials of Micro and Macroeconomics
4. Actuarial Mathematics in Insurance
5. Theory of Economic Growth
6. Actuarial Mathematics
7. Operations Analysis, a Probabilistic Approach
8. Selective Problems of Discrete Mathematics
9. Practical Finances, Financial Analysis and Economics

In the United States, there is a series of 10 exams that must be passed to be fully credentialed. Normally these exams are taken while working full-time in an actuarial career, although it is common to pass the first one or two exams while still attending university. A great deal of dedication and discipline is required.

There are a variety of ways to prepare for almost 15 examinations necessary to receive a Certificate of Accredited Actuary in the UK. Apart from universities that offer master degree programs in actuarial science Actuarial Professional Bodies also provide certificate courses as well as professional development courses for qualified actuaries. Only those who have completed the necessary examinations, have at least three years of practical actuarial work experience are eligible to receive a Certificate of Actuary in the UK.

### PROGRAM DETAILS AND ACHIEVEMENTS

Officially the Master Degree Educational Program in Statistics and Actuarial Science commenced on June 22, 2001, however, many of the activities are already well underway and some achievements, which will ensure that the program is of international standard, are set out below:

- With support from USAID/PADCO a fully equipped computer laboratory and a resource center, together with a textbook library for the program, have been created at YSU.
- With support from USAID/PADCO The YSU has already established good working relationships with Kyiv Shevchenko University (KSU), which has already developed a strong actuarial education program. This partnership assisted YSU professors in developing the curriculum.
- A series of training sessions in Financial Mathematics, Actuarial Mathematics, SPSS, and other subjects related to statistics and actuarial science will be conducted by USAID/PADCO experts to further support YSU in developing this program.
- In cooperation with the Ministry of Social Security the students will be given the opportunity to take part in real life problem solving.

### COURSES TO BE TAUGHT IN THE PROGRAM

- A. General Courses**
- 1 Foreign Language
  - 2 Informatics and Software Packages
  - 3 Economics
  - 4 Philosophy
- B. General Professional Courses**
- 1 Probability Theory, Advanced Course
  - 2 Mathematical Statistics and Economics
  - 3 Stochastic Processes
  - 4 Operations Analysis and The Theory of Games
  - 5 Mathematical Programming of Economic Models
  - 6 Theory of Optimal Control and Approximations
- C. Special Professional Courses**
- 1 Stochastic Modeling
  - 2 Financial Mathematics
  - 3 Essentials of Micro and Macroeconomics
  - 4 Actuarial Mathematics in Insurance
  - 5 Theory of Economic Growth
  - 6 Actuarial Mathematics
  - 7 Operations Analysis, a Probabilistic Approach
  - 8 Selective Problems of Discrete Mathematics
  - 9 Practical Finances, Financial Analysis and Economics

Those interested please contact us at:

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FOR ADDITIONAL INFORMATION ON THE ACTUARIAL PROFESSION PLEASE VISIT:

[www.soa.org](http://www.soa.org)  
[www.actuaries.ca](http://www.actuaries.ca)

[www.actuaries.org.uk](http://www.actuaries.org.uk)  
[www.acted.co.uk](http://www.acted.co.uk)



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YEREVAN STATE UNIVERSITY



MASTERS DEGREE PROGRAM  
IN STATISTICS AND ACTUARIAL  
SCIENCES AT THE  
YEREVAN STATE UNIVERSITY  
(The Faculty of Mathematics)

“MAKING FINANCIAL  
SENSE OF THE FUTURE”



## WHAT ARE ACTUARIES AND WHAT DO THEY DO?

Actuaries are professionals who apply their knowledge of mathematics, particularly of probability, statistics and risk theory, to real-life financial problems involving future uncertainty. These uncertainties are usually associated with life insurance, property and casualty insurance, pension or other employee benefit plans, or providing evidence in courts of law on the value of lost future earnings. By applying skills to these situations, actuaries help people to plan better for the future by reducing risk.

Actuaries pride themselves on their ability to make financial sense of the future. This expertise gives the actuarial profession an unrivalled appreciation of financial risk management - one of the most fundamental, but poorly understood areas of business.

Much of life is very uncertain. There are the risks of sickness, disability, unemployment, property damage and loss, and dying young or unexpectedly. While the risks are unpredictable for any one individual, actuaries can, for example, analyze statistics to design and price insurance policies and benefit plans for a group of individuals to spread individual risks among members of the group.

Being skilled mathematicians, actuaries are able to analyze past events, assess the present risks involved, and model what could happen in the future. Actuaries may then forecast the long-term financial implications of business decisions to assess the most likely outcomes and the chances of more or less favorable outcomes occurring.

## WHY DOES ARMENIA NEED ACTUARIES?

Armenia needs to develop the profession of actuary in order to build up a cadre of actuarial professionals to underpin reforms in the pension and social insurance system and in order to lay the foundation for the development of a viable private insurance industry. Continuous actuarial review is necessary to monitor trends and fiscal sustainability, analyze claim experience, set contribution rates, and recommend changes.

Internationally it is recognized that actuaries are essential to the process of economic reform and in many countries, for many years, government actuaries have been advising on a comprehensive range of matters which affect public policy and help ensure the soundness of both public and private pension schemes. The UK Government Actuary's Department, for example, has existed since 1919.

## HOW CAN ARMENIA DEVELOP AN ACTUARIAL PROFESSION?

There are many English or Russian texts that can be used for self-study in order to gain an understanding of the subject. However, the best way is to establish a university program in statistics and actuarial science here in Armenia and develop a strategy for accrediting local actuaries. Professional credentials are essential if the actuary is going to be accepted and recognized in the international community.

In the short term, Armenia will need to prepare actuaries through training on the job. Potential employees with strong background in mathematics will start doing actuarial work under the guidance of an experienced senior actuary. The most likely place for employment in Armenia would be either in state social insurance funds, banks, investment companies, or large international insurance companies. The creation of an Actuarial Office will be essential for the immediate development of actuaries in Armenia as well as being critical to the proper administration of social insurance funds.

In the long term, actuaries must be prepared by enrolling in specially designed actuarial education programs located within the Yerevan State University. Under the USAID funded Armenia Social Transition Program USAID/PADCO is providing assistance to the Government of Armenia on social sector reform issues. USAID/PADCO is assisting the GOA to build actuarial capacity in Armenia.

In June 2001 PADCO began to work in close collaboration with Yerevan State University to support the introduction of a new Masters Degree Program in Statistics and Actuarial Science.

To design and implement successful reforms in Armenia's social insurance systems and to manage those systems effectively in the future, the GOA with support from USAID/PADCO is undertaking capacity building for proper financial projections of the revenues and expenditures of its social insurance systems.

Developing the necessary actuarial capacity for financial modeling in Armenia involves three separate tasks:

- Creating a permanent education program to prepare actuaries to work in government or in the private sector;
- Designing reliable financial models to make forecasts and training specialists in the use of these models;
- Creating an Actuarial Office in the Ministry of Social Security and State Social Insurance Fund where trained specialists will conduct financial analyses of social insurance funds.

## WHAT EDUCATION AND SKILLS ARE NEEDED TO BE AN ACTUARY?

Actuaries must have a strong competence in mathematics. Many actuaries have university degrees in mathematics, and many countries offer degree programs in Statistics and Actuarial Science within university mathematical departments. Actuaries are required to pass a stringent series of exams in order to be considered a credentialed actuary.

Essentially, actuarial mathematics results from combining probability and statistics with financial mathematics. A solid background in calculus is a prerequisite for an actuarial career. Someone with the proper mathematical aptitude and knowledge can learn the required skills with extensive study and experience. It is also helpful, but not mandatory, to have a broad background in business-related subjects such as economics, accounting, law, business organization and business finance.

## WHAT ARE THE NECESSARY QUALIFICATIONS TO ENROLL IN THE STATISTICS AND ACTUARIAL SCIENCE DEGREE PROGRAM AT YSU?

To enroll into the Statistics and Actuarial Science Master Degree Program at the YSU at least a Bachelor Degree in Mathematics is necessary. In 2001, only those students with 4.5 and higher average cumulative grade will be allowed to apply for the Master Degree Program. Students who demonstrate a deep knowledge in calculus, theory of probability, and mathematical statistics will be given the opportunity to enroll in the Program.

## HOW ARE ACTUARIES TRAINED IN THE NORTH AMERICA AND WESTERN EUROPE?

Training of actuaries in North America and Western Europe is a combination of examinations and practical experience. The qualification examination program provides a full background in all aspects of actuarial work, both mathematical and practical. The program is rigorous and time consuming. However, theoretical knowledge without practical experience is not very useful. It is essential for an aspiring actuary to be involved with actuarial issues on a daily basis. Participation in the preparation of actuarial valuations, special studies, experience analysis and other actuarial activities is essential.

## Առաջարկվող Ծառայություններ

Ակրուարական գրասենյակն առաջարկում է հետևյալ ծառայությունները՝

- պարահական երեւոյթների դեպքում ապահովագրական սակագների հաշվարկ և հիմնավորում, համապարասխան փոխհարուցումների հաշվարկ,
- կյանքի երկարաժամկետ ապահովագրության դեպքում ապահովագրական սակագների հաշվարկ,
- ակրուարական հաշվիչների պարասպում,
- ապահովագրական ընկերությունների համար անհրաժեշտ պահուստային ֆոնդերի հաշվարկ,
- ֆինանսական բնագավառում պարահական դեպքեր տեղի ունենալու հավանականության եւ դրանց հետ կապված ռիսկերի գնահատում,
- խորհրդարվություն նշված բոլոր ծառայությունների գծով:

### Ինչպես նաև՝

- սոցիոլոգիական հետազոտության գործիքների պարասպում,
- սոցիոլոգիական հետազոտության իրականացում,
- տվյալների վիճակագրական և սոցիոլոգիական վերլուծություն:

### Հեղադարձ կապ

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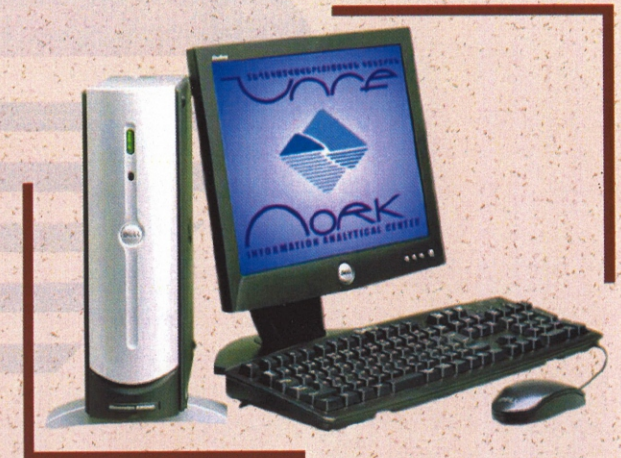
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## ՆՈՐ-Բ ՏԵՂԵԿԱՏՎԱԿԵՐՈՒԾԱԿԱՆ ԿԵՆՏՐՈՆԻ ԱԿՏՈՒԱՐԱԿԱՆ ԳՐԱՏԵՆՅԱԿԸ



## «Ակրուարական Գրասենյակի» ստեղծումը

2000թ. հոկտեմբերի 24-ին ՀՀ կառավարության որոշմամբ, Համաշխարհային Բանկի և USAID/PADCO փոխնիկական աջակցությամբ ստեղծվեց «Նորք» փեդեկավերլուծական կենտրոնը:

2001թ. USAID/PADCO աջակցությամբ կենտրոնում ստեղծվեց Ակրուարական գրասենյակ, որպես աշխատում են 2001թ.-ին ԵՊՀ-ում բացված «Ակրուարական մաթեմատիկա» մագիստրոսական ծրագրի առաջին շրջանավարտները:

Գրասենյակը զինված է հզոր համակարգիչներով և գործունեության համար անհրաժեշտ ծրագրային փաթեթներով՝ SPSS, E-views, PROST; ինչպես նաև հագեցած է մասնագիտական գրականությամբ:

Գրասենյակն առայժմ ՀՀ-ում գործող միակ ակրուարական գրասենյակն է:

## «Ակրուարական Գրասենյակի» առաքելությունը

Հայաստանում պետական կենսաթոշակային և այլ սոցիալական ապահովագրական ծրագրերը, պետական կենսաթոշակային համակարգը, բժշկական ապահովագրական ընկերությունները և այլ մասնավոր ապահովագրական ընկերություններն ու կենսաթոշակային հիմնադրամները կարիք ունեն ինչպես առավել արդյունավետ ղեկավարման, այնպես էլ յուրաքանչյուր ոլորտում հեռանկարային զարգացման, արդյունավետ պլանավորման, ֆինանսավորման, մոնիթորինգի ու գնահատման:

Այս հիմնախնդիրների լուծման համար անհրաժեշտ է Հայաստանում ձևավորել հզոր ակրուարական համակարգ: «Նորք» փեդեկավերլուծական կենտրոնում «Ակրուարական գրասենյակի» ստեղծումը այդ համակարգի կայացման առաջին քայլերից մեկն է:



## Կատարված աշխատանքներ — իրականացված ծրագրեր

Գրասենյակն իր ստեղծման պահից զբաղվում է բազմաթիվ ակրուարական և սոցիոլոգիական խնդիրներով, որոնցից են՝

- Աղքատության ընդհանրական նպաստների համակարգի վերլուծություն և ռեգրեսիոն մոդելների կառուցում:
- ՀՀ կենսաթոշակային համակարգի բարեփոխումների ծրագրի վերլուծություններ և կանխատեսումներ:
- Պարտադիր բժշկական ապահովագրության համակարգի ներդրման վերլուծություն:
- Ապահովագրական սակագների հաշվարկ և հիմնավորում:

## Պոլիհամագործակցություն

- Երևանի Պետական Համալսարան Բացի այն, որ ակրուարական գրասենյակում աշխատում են ԵՊՀ շրջանավարտները, 2005թ.-ին «Նորք» կենտրոնը և ԵՊՀ-ն ստորագրել են համագործակցության հուշագիր՝ համարել ակրուարական հեղափոխությունների իրականացման և ուսանողների արտադրական պրակտիկայի անցկացման վերաբերյալ:
- ՀՀ Աշխատանքի և սոցիալական հարցերի նախարարություն
- ՀՀ Առողջապահության նախարարություն
- ՀՀ Սոցիալական ապահովագրության պետական հիմնադրամ
- Ապահովագրողների ասոցիացիա և ապահովագրական ընկերություններ 2006թ.-ից գրասենյակն ապահովագրական ընկերությունների համար կատարում է սակագների հիմնավորման հաշվարկներ:
- ՀՀ կենտրոնական բանկ



the resource center has the latest models of professional financial calculators that are used to develop the students' skills in financial problem solving. Both the professors and the students use the library at the center, which has been supplied, by ASTP, with the latest publications related to actuarial science.

Actuarial Science students take a substantial number of calculus, algebra, probability, and statistics courses as well as courses that cover actuarial topics and some courses i.e. finance, economics. In addition to the courses required for graduation, students should carefully consider electives that will coordinate with an actuarial career.

A Governmental Decree #1628 (October 23, 2002) included the specialty "0139-Actuarial Mathematics" in the list of university programs. This will allow direct enrollment into the Bachelor Degree Program with an actuarial focus starting in 2003.

In June 2002, the Actuarial Office was created at the MOSS. The Actuarial Office is located at the "Nemrut" Analytical-Informational Center. ASTP/USAID supported the MOSS and Nemrut Center in the selection of the Actuarial Office staff, equipping the office with computers and software, and financial calculators. The Actuarial Office employees take part in the Actuarial Master Degree Program (AMDP) classes and use YSU Library collections.

ASTP have organized a series of on the job training opportunities and seminars on actuarial subjects involving both local and international experts. An example of the seminars conducted are: the Theory of Probability and Mathematical Statistics; Computer classes in Windows Applications, SPSS, PROST; Financial Mathematics; Mathematical Statistics for Economics; Macroeconomics; Actuarial Mathematics; seminars on "Non-State Pension System Prerequisites", "The Regulator: Its Creation, Role, and Functions", Statistical Methodology, "Household Income/Expenditure Survey Database Cleaning Issues", and "British Pension System".

The PROST (Pension Reform Options Simulation Toolkit), a widely used reliable financial model (developed by the World Bank) for making pension forecasts was adapted to suit the Armenian environment. The actuaries, students, and many representatives from social sector institutions were trained to use the software.

The Actuarial Office employees, AMDP students have been taking English language classes organized by AED. This will increase their access to international actuarial best practice as most actuarial publications are in the English language.

## NEXTSTEPS

A number of recent developments have underlined the pressing need for the development of the actuarial profession in Armenia. A draft law has been developed creating a system of mandatory medical insurance and this law specifically calls for the introduction of the system "based on actuarial studies establishing the fiscal viability of the system." The Law on State Pensions" that has already passed three readings also calls for pension increases based on actuarial modeling of their financial viability. A draft law on Insurance, now being discussed, refers to a requirement for insurance companies to engage the services of qualified actuaries.

For these reasons USAID/PADCO is exploring areas of further support to contribute to the professional development of actuarial skills in Armenia:

- With support from USAID/PADCO the Center for Actuarial Sciences (YSU) will be provided with international actuarial scientific journals in 2003;
- USAID/PADCO will promote internship programs for YSU students to link the educational program with real-life businesses;
- USAID/PADCO will assist in the development of a code of professional conduct, which is critical for the proper and lawful development of the actuarial community in Armenia;
- USAID/PADCO is researching opportunities to provide a visiting expert in the actuarial aspects of health insurance to support the MOH in developing an actuarial model of the mandatory health insurance system;
- USAID/PADCO is planning to organize a series of trainings in actuarial science related areas;
- USAID/PADCO is exploring further opportunities to support the best YSU actuarial students to study abroad and receive a recognized international actuarial degree;
- USAID/PADCO is exploring the possibility of providing actuarial training abroad for the YSU faculty staff;
- USAID/PADCO is exploring opportunities to support the translation of a number of actuarial textbooks into the Armenian language;
- USAID/PADCO is exploring opportunities to link the potential Armenian actuaries with international actuarial organizations with a view to establishing an actuarial accreditation program.

For additional information on the actuarial profession please visit:  
[www.soa.org](http://www.soa.org) [www.actuaries.org.uk](http://www.actuaries.org.uk)  
[www.actuaries.ca](http://www.actuaries.ca) [www.acted.co.uk](http://www.acted.co.uk)  
[www.casact.org](http://www.casact.org) [www.aerf.org](http://www.aerf.org)

Those interested please contact us at:  
 5 Alek Manoogyan Street,  
 Yerevan State University,  
 Faculty of Mathematics,  
 Phone: (3741) 55-11-48 [www.yasu.am](http://www.yasu.am)



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The opinions expressed herein are those of the author(s) and do not necessarily reflect the views of the U.S. Agency for International Development



YEREVAN  
STATE  
UNIVERSITY



ARMENIA SOCIAL  
TRANSITION PROGRAM  
(USAID/PADCO)



NEMRUT  
ANALYTICAL-INFORMATIONAL  
CENTER



THE PROFESSION  
OF ACTUARY  
IN ARMENIA

## WHAT ARE ACTUARIES?

Actuary is a professional who analyzes the financial consequences of risk. Actuaries use mathematics, statistics, probability, and financial theory to study uncertain future events, especially those of concern to insurance and pensions. Actuaries may work for insurance companies, consulting firms, government, employee benefits departments of large corporations, hospitals, banks and investment firms, or, more generally, in businesses that need to manage financial risk. A career as an Actuary is better described as a "business" career with a mathematical basis than as a "technical" mathematical career.

In addition to having a sound knowledge and a definite liking of mathematics, a successful actuary must have practical business sense, the creativity to come up with innovative solutions to new problems, effective communication skills, and the ability to work with a wide variety of people. Many actuaries are skilled in areas such as computers, economics, investments, marketing, and general management.

## WHAT DO ACTUARIES DO?

Consulting firms or life insurance, reinsurance, property and casualty insurance companies, universities, government, and industry employ most actuaries.

In life insurance companies, actuaries are involved in almost every aspect of the business including development of new products and services, investment management, marketing, administration, and a wide range of general management responsibilities. Because their judgment is heavily relied upon, a significant percentage of actuaries employed with insurance companies achieve senior management positions. Actuaries have had a legal obligation to ensure the solvency of insurance companies since 1991.

Actuaries are also involved in a wide range of activities in the consulting field. The consulting pension actuary's basic work is to assist employers, labor unions and trustees in the design, funding, and administration of private pension plans and other employee benefit plans.

Some actuaries specialize in the probabilities of loss arising from events such as sickness, disability and casualties caused by fire, theft, windstorm, or automobile accident.

Actuaries' skills have long been recognized by a justice system. Actuaries are routinely called upon to give evidence in court as expert witnesses on issues such as lost future earnings. In the civil case seeking damages on behalf of surviving relatives of the 329 people who died in the 1985 Air India bombing, an actuary was hired to calculate the lost future earnings of the victims.

The explosive growth in medical insurance, employee benefits, private pension plans, RRSPs (Registered Retirement Savings Plan), and mutual funds has posed new challenges for actuaries, especially in the expanding area of managing risk. Actuaries help investment fund managers maximize their returns.

In other emerging areas of professional activity, actuaries are working to improve medical insurance plans by showing the long-term savings possible through alternative treatments or the introduction of new drugs. In the emerging field of environmental damage costs, actuaries are advising companies on how to set up trust funds to cover the expenses decades from now.

While the insurance business is a mature industry (undergoing consolidation) in developed markets, it remains a major employer of actuaries. As well, there is an increasing demand for actuaries in non-traditional roles such as: compensation consulting, workers' compensation, health care management, financial planning, investments, environmental liability, and information systems.

## WHY SHOULD I CHOOSE AN ACTUARIAL CAREER?

Actuaries describe their work as challenging and interesting and generally enjoy a good working environment. For the second time in the past decade, the Jobs Rated Almanac, ranking professions and occupations, has rated a career as an actuary the best job in North America. Today's actuary practices as a self-employed consultant, or as a salaried employee in a small or large firm. Actuaries have risen to top management positions in large corporations, particularly in the insurance and consulting industries.

Entry into the profession is very competitive and success in the field demands commitment and hard work during college and the few years after graduation when taking actuarial exams. The qualities sought in applicants are high technical ability, good communications skills, and a broad background including courses in mathematics, statistics, business, and the liberal arts. While it is not a formal requirement to have a university degree to become an actuary, most actuaries are university graduates and have taken courses in mathematics, economics, commerce, accounting, business administration, computer science or marketing. To become an actuary in Europe or the US there are three basic requirements, education, experience, and the successful completion of a series of qualifying examinations supervised by various professional bodies.

## WHY DOES ARMENIA NEED ACTUARIES?

Armenia needs to develop cadre of actuarial professionals to manage: state pension and other social insurance programs; state pension system; professional and temporary disability funds; health insurance companies; private insurance companies; and private pension funds, as well as to support the development of its private insurance industry of great vitality. Consulting firms or life insurance, reinsurance, property and casualty insurance companies, universities, government and industry may employ actuaries.

The demand for the career is foreseen to be steadily increasing for the approaching years, due to the soon coming mandatory health insurance, state and voluntary pension insurance system establishment and increasing demand to develop viable private insurance system in Armenian.

## HOW HAS USAID BEEN HELPING ARMENIA TO DEVELOP ACTUARIAL PROFESSION?

The USAID funded Armenia Social Transition Program implemented by PADCO, Inc. is assisting the GOA to build governmental institutional capacity to plan for, finance and administer sustainable and effective insurance systems through:

- ▲ Developing permanent actuarial educational programs at Yerevan State University (YSU)
- ▲ Creating a Center for Actuarial Sciences at YSU
- ▲ Establishing the profession of actuary in Armenia
- ▲ Creating an Actuarial Office at the Ministry of Social Security
- ▲ Organizing short-term on the job training for trainee actuaries
- ▲ Developing actuarial models for the social and health sector.

ASTP helped Yerevan State University to establish a Master Degree Program in actuarial mathematics and the first seven students were enrolled in September 2001. The purpose of the program is to provide a broad quantitative background in mathematics, statistics, and related areas that is needed to succeed in the actuarial profession and to provide the academic background needed to pass the actuarial accreditation exams.

The creation of the Center for Actuarial Sciences (CAS), a fully equipped computer laboratory and a resource center, provides a unique training facility in the Caucasus. The computers at the CAS are installed with a range of software including SPSS, PROST, and Professional C++. In addition

## INTERESTING STORY

The Guinness Book of World Records at these writing lists the oldest authenticated living person as Jeanne Calment of Arles, France, who celebrated her 122d birthday on February 21, 1997.

In 1965, a forty-seven-year-old lawyer named André-François Raffray bet that he would outlive Mme. Calment, who was then ninety. He agreed to pay her about five hundred dollars a month for the right to move into her splendid apartment on the second floor of a classic old building in the center of Arles when she died.

Buying apartments this way is common in France, where the transaction is called *en viager* ("for life"). If all goes according to the actuarial tables, it can be a good deal for both parties: The elderly apartment owner gets to enjoy a monthly income from the buyer, who gets a real-estate

bargain - provided the owner dies in reasonable time. Upon the owner's death, the buyer inherits the apartment, regardless of how much was paid. M. Raffray did not get a bargain.

He died at Christmas, 1995, at the age of seventy-seven, having laid out the equivalent of one hundred and eighty-four thousand dollars, more than twice the market value of an apartment he never got to live in. On the day he died, Jeanne Calment dined on foie gras, duck thighs, cheese, and chocolate cake at the nursing home she was living in while her prized apartment stood vacant.

Moreover, M. Raffray's widow was legally obligated to keep sending that monthly check. If Mme. Calment outlives her too, then the Raffray children and grandchildren will have to pay.



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CENTER FOR  
ACTUARIAL  
SCIENCES



## CREATING AN ACTUARIAL SCIENCES PROGRAM AT YEREVAN STATE UNIVERSITY

On September 26, 2001, the Actuarial Sciences Center at Yerevan State University was officially opened. The ceremony was addressed by Radik Martirosyan, the Rector of the University, Razmik Martirosyan, Minister of Social Security, Romen Shahbagyan Dean of the Faculty of Mathematics and Keith Simmons, Director of the USAID Armenia Mission. The center offers a two-year graduate degree in actuarial sciences. The first class of seven students, all of which are female, was selected on the basis of their strong mathematical skills. It is interesting to note that in Western Europe and in the US, the profession of actuary is predominantly a male profession. This is the first such program in the Caucasus and there has already been interest in developing similar programs from other universities in the region.

Working with Yerevan State University, PADCO supported the development of the new actuarial center. PADCO assisted the university by funding the creation of the two-room Center for Actuarial Sciences. This includes classrooms, teaching materials, a library and eight computers – all provided by the project.



USAID Mission Director Keith Simmons, addressing the opening ceremony of the Center for Actuarial Sciences, YSU. On his left are: Romen Shahbagyan, Dean of the Faculty of Mathematics, Razmik Martirosyan, Minister of Social Security of the Republic of Armenia, and Radik Martirosyan, Rector of YSU.

"The students who will be produced here represent a major leap forward in the financial security of a growing number of Armenians," noted Keith Simmons. "Actuarial scientists trained through this program will assure the long-term viability of the Armenian pension system, allow effective development of both public and private insurance programs, and significantly enhance Armenia's ability to understand and engage in the world of global finance."

The program was made possible with the support of USAID through PADCO. PADCO is the prime contractor for USAID's Armenia Social Transition Pro-

gram through which the Government of Armenia is being assisted to implement far-reaching reforms in social and health programs. These reforms include restructuring the country's impoverished pension system. With the beginning of pension reforms, the need for skilled actuaries became evident.

Professor Alexander Ponamarenko, a professor of the mathematical faculty from Kyiv Shevchenko University of Ukraine visited Armenia to advise on the design of an actuarial curriculum – which combines statistics, mathematics and finance skills. PADCO had collaborated with Kyiv Shevchenko University earlier in developing the program and the teaching materials at that university. Experience with graduates from that program has shown that trained actuaries are highly valued by state and private financial firms because of the rigor of their training.

The term "actuary" is new to Armenia. PADCO therefore prepared a brochure that explains the concept of the science and describes the Master Degree Program at YSU.

Thanks to the decision of the Ministry of Sciences and Education the specialty "0144-Actuarial Mathematics" will be included in the list of Bachelor Degree Programs. This will allow organizing enrollment directly to the program starting from 2003. The tentative list of subjects to be taught in the four-year program is presented in the loose leaf.



Minister Razmik Martirosyan, the Rector of YSU Radik Martirosyan, Mission Director Keith Simmons, and the Dean of the Mathematics Faculty Romen Shahbagyan pose with the incoming class of actuaries at the opening of the Actuarial Sciences Center at Yerevan State University.

From early meetings between PADCO and the University to the opening of the center and the induction of the new class of students took only eight months. The cost of the renovation and classroom furnishings and the computer equipment was less than \$25,000. PADCO will continue to support the program with further training, assistance in securing full accreditation for the pro-

gram, and in marketing the Center for Actuarial Sciences.