# Who are actuaries?

Actuaries use probability models to quantify uncertainty and risk in business problems. Here risk refers to the chance of a financial loss. Actuaries assemble and analyze data related with risks to answer questions such as how much to charge policy-holders for auto, life or health insurances, how to set up retirement plans, how to formulate investment strategies in light of future risks. They provide an evaluation of risk for their companies for strategic decisions.

Because of the crucial role in such decision making, actuaries are are rewarded accordingly; salaries offered to actuaries are substantial (see two salary surveys done by D.W. Simpson & Company and Ezra Penland here), and there is ample opportunity for advancement in the actuarial profession. Moreover, actuarial careers often lead to upper management and executive positions.

Actuary is one of the top rated jobs in America. Read this article for a Ranking of Best and Worst Occupations in the U.S. where actuary is ranked as the second best occupation. Incidentally, the first and third best occupations are mathematician and statistician, both of which are within the domain of mathematical sciences.

Actuaries are employed not only by insurance companies but also by consulting firms, federal and state insurance departments, universities, banks, investment firms, large corporations and public accounting firms. In government, actuaries help to manage such programs as the Social Security system and the Medicare. Consulting actuaries help different clients to establish benefit programs (insurance and retirement) for their employees and they also provide consulting service to smaller insurance companies. Actuaries also analyze investment programs and participate in corporate planning, such as merger and acquisition.

Among the specialties of actuary are: life insurance, health insurance, (property) casualty insurance, (retirement planning) pensions, consulting. About 70% of the actuaries work in the insurance industry. For example,

- Property/Casualty (P/C) actuaries use mathematical models to understand different information to be used in the development and maintenance of the company's products. Their main task is insurance pricing. They study which rate to charge customers for insurance, run computer programs calculating the earned premiums and losses, and create better models. They have to be extremely detail-orientated and be a wizard when it comes to spreadsheet manipulations. Calculations made by actuaries are crucial to the competitivity of their company. These calculations include the rate of an insurance product, how much an insurance company expects to pay in claims when financial losses occur, and estimates on the evolution of the investments of the fund reserve of the company.
- Pension actuaries do computations related to retirement programs. Many companies supply pensions to their employees by setting up a company pension fund. Calculations have to be made to know whether the pension is well funded. Benefit calculations have to be made for estimating the future payment in pension and the evolution of the reserves in the pension fund. As these pension funds have to follow federal regulations, actuaries must know the tax law. Government papers certifying that the pension fund is well funded must be signed by an actuary. An actuary gets certified to sign these legal documents by passing some actuarial exams.

Actuarial work is a challenging and rewarding way to use an aptitude for mathematics combined with an

ability to work with people. Besides a natural aptitude for mathematics, a creative mind, and the ability to reason logically, actuaries must be up-to-date on business issues and they must be good communicators to explain things to non-actuaries.

Further information on what is an actuary can be found on the website Be An Actuary and in the Occupational Outlook Handbook from the US Department of Labor.

# How to become an actuary

To become an actuary one needs to get training in mathematics, probability/statistics, economics, finance and business in general. Professional certification is obtained by passing a series of examinations administered by the actuarial societies, including the Society of Actuaries (SOA) and the Casualty Actuarial Society (CAS). More specialized organizations are the American Society of Pension Actuaries and the Conference of Consulting Actuaries.

Actuaries earn professional designations based on the organization they belong to and their status in the professional exam system. Common credentials are named Associates and Fellows. For example, FSA means *Fellow of the Society of Actuaries* and ASA means *Associate of the Society of Actuaries*. Again, to obtain these designations, one has to meet certain professional educational standards by passing a series of exams. The early exams are jointly administered by the two societies SOA and CAS.

## Get to get associateship

To attain the Associate of the Society of Actuaries (ASA) designation, candidate needs to successfully complete

- VEE Mathematical Statistics
- VEE Economics
- VEE Accounting and Finance
- Exam P–Probability
- Exam FM–Financial Mathematics
- Exam IFM–Investment and Financial Markets
- Exam LTAM–Long-Term Actuarial Mathematics
- Exam STAM–Short-Term Actuarial Mathematics
- Exam SRM-Statistics for Risk Modeling
- Exam PA-Predictive Analytics
- Fundamentals of Actuarial Practice (FAP) e–Learning Course
- Associateship Professionalism Course (APC)

CAS is a little different. To become an Associate member of the Casualty Actuarial Society (ACAS), a candidate must fulfill the following requirements

- VEE - Accounting and Finance
- VEE - Economics
- Exam 1 - Probability

- Exam 2 - Financial Mathematics
- Exam 3F - Financial Economics
- MAS-I Modern Actuarial Statistics I
- MAS-II Modern Actuarial Statistics II
- Online Courses
  - Risk Mgmt. & Insurance Ops.
  - Insurance Accounting, Coverage, Analysis, Insurance Law & Insurance Regulation
- Course on Professionalism
- EXAM 5 Basic Techniques for Ratemaking and Estimating Claim Liabilities
- EXAM 6 Regulation & Financial Reporting (Nation-Specific)

## VEE requirements

The actuarial societies allow to have some requirements to be Validated by Educational Experience(VEE). Please see the VEE requirements for more information.

## Study during and after college

The completion of all these exams take several years. Most preparation for these exams is done through self-study while attending college and while working. Candidates must being able to motivate themselves.

Students wishing careers in this field are urged to complete at least 2 actuarial exams while in college. At the very least, students pursuing this career must pass one exam within a few months after graduation in order to earn a chance to be considered in the job market. Nowadays, with more and more attentions on the actuarial profession, it is difficult to even find an internship position without having two exam passed before the junior year. Hence, students who wish to enter the career must be aware of what they are facing and start preparing for exam as early as possible.

The completion of the rest of the professional credentials is done while working as an actuary after college. Most employers hire college graduates who have shown interest and great potential in passing these series of examinations. Employers often establish programs to assist students and employees in preparing for exams (in the forms of providing exam fees, study materials, study time, on-the-job training for the exams, award raises for each exam passed.) At the same time, job provides a broad experience in actuarial work.

## Fellowship

Requirements for fellowship usually include additional examinations and training on a candidate's chosen track. Please refer to the societies' website for more information.