

### Jokes often portray actuaries

as math geeks who are dull, painfully shy or overly cautious.

Have you heard the punchline: an actuary is an accountant without a sense of humour? Then there's the story about a physician who advises a patient with only one month to live to marry an actuary — because it will feel like five years.

And yet another actuary joke explains the difference between an introverted actuary and an extroverted one: the introverted actuary looks down at his shoes while talking to you, while the extroverted one stares down at your shoes.

Nobody enjoys actuary jokes more than Claude Lamoureux, 65, a Laval University actuarial science graduate who last year retired from his job as president and CEO of the Ontario Teachers' Pension Plan Board, Canada's top pension fund with assets of \$108.5 billion. When Lamoureux makes speeches, he frequently makes fun of actuaries to amuse his listeners.

Actuaries evaluate and manage risk for insurance companies, pension fund plans, government regulators and social programs as well as individuals, by using financial and statistical tools to solve business problems. And all jokes aside, Lamoureux says, the most important talents for actuaries are really leadership, teamwork and communications skills.

"It's about people at the end of the day," he says.

The stereotype of the dry actuary certainly doesn't ring true for more recent graduates Wendy Yu and Graham Sutton. Yu graduated from the actuarial science program at the University of Waterloo in Waterloo, Ont., in 2005; Sutton, in 2004.

Yu, 24, is far from dull. She recently strapped on a parachute and jumped out of an airplane with two colleagues.

"Being risk-aware is not the same as being risk-averse," says the Toronto

native, who now works at Milliman Inc., a consulting firm in Chicago that provides advice on life, health, and property and casualty insurance, as well as on benefits and investments. Milliman also has a skydiving team.

"The job is about getting comfortable with uncertainty, but not too comfortable," Yu says. "Yes, there is a lot of number crunching, but it's also philosophical."

Sutton, 27, likewise enjoys that aspect of his job as a senior actuarial analyst with Toronto-based Sun Life Financial Inc., one of Canada's largest life insurers.

"There's no right or wrong answer in this field. There's a range of acceptable solutions," says Sutton, a native of Kincardine, Ont., a small town on the shores of Lake Huron. "So, this requires you to be creative in order to come up with new ways of getting to this range. You have to think outside the box, and that's what makes it interesting — and challenging — at the same time."

Another part of the appeal for Yu is the ability to apply her math skills to answer real-life questions. She is no math geek. "I chose actuarial science as opposed to applied math because it is very specific, and I wanted to apply my knowledge to real problems as soon as possible," she says. "When I was in my third year of university, my dad changed jobs and I was able to value his defined-benefit pension liability."

As for Sutton, although his father and brother are engineers, he was drawn to actuarial science because he wanted to pursue a business career.

"If you're strong in math and you enjoy the business world, it's a perfect mix of the two," he says. "You can see these financial products, as an example, that people are purchasing and using and that are necessary to get them through life. And you are the one helping develop them. For me, personally, that is more gratifying than working on theoretical concepts."

Graham Sutton

BY LAURA BOBAK

Using statistical analysis and financial modelling, it is the actuary's role to study the likelihood of future financial events and their associated costs, and how those events will affect the amount and the timing of a future payout.

An example of an unknown variable is the lifespan of a pension-plan member or a holder of a life insurance policy. An actuary at a pension fund such as Teachers' might be required to calculate how much money the plan would need to invest today so that the members' pension benefits can be adequately funded when the members retire, given that some plan members will have a longer retirement than others.

A typical assignment for an actuary working for a life insurance company might involve designing an insurance

careers progress, they might begin to apply their skills to business challenges. The actuaries might then start to work more with clients, helping them solve their business problems. As this happens, the actuaries become less and less involved in the mathematics of the work. Finally, veterans might manage teams of actuaries and be very involved in working closely with clients and reviewing reports prepared by staff; they have very little hands-on involvement in the math side of the work.

While an actuary's job may deal with unknowns, one thing is certain: this career is surging in popularity, Hardy says. Those looking for a hot, lucrative career in the business world will also probably like the numbers on an actuary's paycheque.

have to give up quite so much of your life for them."

Some Canadian actuarial students snag plum jobs right out of the gate. Hardy notes that a recent University of Waterloo graduate was recruited directly into an associate vice president position.

But it's not just money and status that attracts bright lights to this field. An actuarial career ranks highly compared with other careers when factors such as work environment, employment outlook, physical demands, security and stress are considered. In fact, the job has been consistently ranked as one of the top four in the U.S. by *Jobs Rated Almanac*.

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policy, making sure that sufficient premiums (the amount the buyer pays for the policy) are charged to ensure that, should the policyholder die at some future but unknown point, there is enough money accumulated to pay out the policy.

Actuaries in insurance, with pensions or any financial services institution also explore how money should be invested for the long term, taking into account potential risks and returns.

"We deal with mortality as a mathematical concept," says Mary Hardy, associate chairwoman of the University of Waterloo's actuarial science department and an actuary herself.

As well, the career duties of an actuary can come to look very different over time, says Les Dandridge, director of communication at the Canadian Institute of Actuaries in Ottawa. For example, actuaries can start out focused on math-oriented work. But as their

The high incomes earned by graduates of actuarial science are a definite draw for those interested in financial services careers. New graduates could expect to earn in the mid- to high five-figure range, Hardy says. After achieving their fellowship designations (see page 67) — which is necessary to become a full-fledged actuary and takes about three or four years after graduation — they should be earning well into six figures.

According to the Society of Actuaries, the association that regulates the profession in the U.S. and Canada, most actuarial fellows earn the equivalent of about US\$150,000-US\$250,000 a year. A fellow working in a major financial services firm could earn as much as US\$500,000.

"The salaries, they're not as big as you can get in the high-powered finance jobs," Hardy says. "But they're more assured and long-term. And you don't

into actuarial science. Actuaries' skills are becoming more relevant to a broader range of industries as demand grows for risk-management specialists.

The latest buzzphrase is "enterprise risk management," which, Hardy says, refers to analysing all the kinds of risks faced by a company, such as credit risk and operational risk, and studying how these might interact.

This strikes Yu as funny, suggesting that actuaries have a fine-tuned sense of irony. "Actually, I think it's funny that only a small fraction of people in any given company are risk managers," she says. "Is everybody else supposed to be a risk producer? One day, when enterprise risk management becomes a strategic issue, as opposed to a compliance issue, an actuarial background will be useful across a diverse set of industries and functions."

Now, did you hear the one about the actuary and the underwriter? •

## GETTING THERE

Although a career as an actuary is both intellectually and financially rewarding, the path to becoming one can be grueling, say those who are in the field.

Not only do you have to be strong in mathematics — especially statistics — but you must also be prepared to branch out into areas such as economics and computer science during university studies.

In addition to meeting university requirements, there is also a series of intense mandatory exams administered by the two professional actuarial societies. One is for life insurance students, who must write about eight exams administered by the Society of Actuaries; the other is for those studying property and casualty insurance, who must write about nine exams administered by the Casualty Actuarial Society.

Once the new graduates have completed the exams, they get a professional designation, depending on their specialization, as either a fellow of the Society of Actuaries (FSA) or as a fellow of the Casualty Actuarial Society (FCAS). A further seminar on Canadian topics is required to attain the fellow of the Canadian Institute of Actuaries (FCIA) designation.

"When I chose actuarial science at the University of Waterloo, I didn't even know that I had to write [non-university] exams," says Wendy Yu, 24, an actuary with Milliman Inc. in Chicago. "My friend broke the news to me. She gave me her study notes with sad faces drawn next to really tricky questions."

Most actuarial science graduates take an average of four years after graduating from university to complete their exams and become a full-fledged actuary, known as a "fellow." Mary Hardy, associate chairwoman of the University of Waterloo's actuarial science department, says most graduates spend about 1,500 hours studying. "It has to be your hobby," she says. "You are studying so much."

Exam fees vary, but, as an example, exams administered by the Casualty Actuarial Society range from US\$240 to US\$500, depending on which of the nine exams the candidate is writing and

whether the candidate is a full-time student or working.

About 70% of students in the University of Waterloo program opt for co-op work placements. This is more demanding than many regular programs are; students complete six paid, four-month work terms that leave them little time for holidays. "The students work their way through university," Hardy says. "They end up leaving university with no debt."

The co-op pay is about \$45,000–\$50,000 a year for a fourth-year student, pro-rated, and is the highest median salary that co-op students at the university earn, Hardy says. But she admits this focus on work experience isn't for everyone.

"You can go to the University of Western Ontario if you want to focus on being a student for four years and don't want to pack up every term to go and earn money," Hardy says of the London, Ont., university's actuarial science program. "Every term in the co-op program, you're either working for a living or you're interviewing to work for a living, and it's relentless. It's tough. I'm astonished at the resilience and cheerfulness of our students. You could not find a nicer, more impressive bunch of people. They're competent. You know they're going to be leaders in their firms."

Work placements aren't mandatory at Western, but they are available as eight- or 16-month internships, says Bruce Jones, associate professor and chair of the department of statistics and actuarial science at the university.

"The employers like [the longer internship], because it allows them to get some work from the students after they've trained them," Jones says. "The students are not leaving just as they get up to speed. That's an advantage to the employer."

The internships have been offered through Western for about 10 years and are slowly catching on. About five students in a third-year class of about 30 or 40 are likely to choose the internship option, says Jones. But not everyone wants to do it because it delays their

graduation. The option is also not yet available for international students.

Annual tuition fees for actuarial science students at the undergraduate level at Canadian universities are about \$5,000. A realistic budget for the year, including living expenses, is about \$20,000. This can be partially offset during senior years if students do work placements.

### HERE ARE SOME OPTIONS FOR STUDYING ACTUARIAL SCIENCE IN CANADA:

- Bachelor's degree in actuarial science with mandatory work co-op: University of Waterloo co-operative program
- Bachelor's degree in actuarial science with no co-op or optional co-op: University of Calgary; Concordia University (Montreal); Lakehead University (Thunder Bay, Ont.); University of Alberta (Edmonton); University of Manitoba (Winnipeg); University of Regina; Simon Fraser University (Vancouver); University of Toronto; University of Western Ontario; University of Waterloo's regular program

### FRENCH-LANGUAGE PROGRAMS:

- Laval University in Quebec City has a highly respected degree, with an emphasis on property and casualty insurance
- University of Montreal offers a co-op option; University of Quebec at Montreal offers a regular bachelor's degree and a second program for advanced exams

### OTHER PROGRAMS:

- Queen's University (Kingston, Ont.), University of Windsor (Ont.) and York University (Toronto) do not offer degrees in actuarial science, but many of their courses cover content tested on actuarial exams

For more information, see the Web sites of the Canadian Institute of Actuaries, at [www.actuaries.ca](http://www.actuaries.ca); the Society of Actuaries, at [www.soa.org](http://www.soa.org); or the Casualty Actuarial Society, at [www.casact.org](http://www.casact.org).

For salary information and job postings, see [www.dwsimpson.com/canada](http://www.dwsimpson.com/canada).