

# Risky Business

2018 Edition

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## An Actuarial Student's Insight into UT Courses

As a second year graduate student in the actuarial science program at UT Austin, most of the courses I have taken so far have been specifically created for actuarial science majors and heavily focused towards the professional exams that actuaries have to take. The design and focus of these classes emphasize the actuarial profession and this is one of the reasons why the actuarial science program at UT is one of the best in the country. My objective of writing this article is to provide a brief insight into the UT courses I have taken so far (and that I plan to take) and how they apply to the field of actuarial science. These courses mostly include the aforementioned actuarial courses geared towards the actuarial professional exams, some courses that fulfill the Validation by Educational Experience requirements as well as some courses that I feel will be very helpful in my career as an actuary.

When I started my graduate study at UT in the Fall of 2017, I already had Exam P (Probability) under my belt and I had been studying for Exam FM (Financial Mathematics). Because of that, I didn't need to take any probability or interest theory courses. So I decided to take M 389D (Intro to Financial Mathematics for Actuaries) and FIN 357 (Business Finance) that cover part of the Exam IFM (Investment and Financial Markets). As a Graduate Teaching Assistant, I also had to take M 398T (Supervised Teaching in Mathematics). M 389D is designed to introduce the concepts of financial markets and derivatives such as forwards, futures and options. It also covers the binomial options pricing model. Most of the quizzes, homework and exam questions are similar to the Exam IFM problems and so you get to practice a lot of Exam IFM type problems. FIN 357 provides a good introduction to the concepts of Corporate Finance that are covered in the Exam IFM and also fulfills the VEE requirement for Corporate Finance; however, it is not a course specifically designed for actuaries.

In the Spring of 2018, I took M 389W (Financial Mathematics for Actuaries), M 389J (Probability Models with Actuarial Applications) and M 349R (Applied Regression and Time Series). M 389W covers the rest of the Exam IFM content. It introduces the concepts of Black-Scholes options pricing model, option greeks as well the topics in corporate finance such as the minimum-variance portfolio theory, asset pricing models, market efficiency, investment and risk analysis, and capital management.

M 389J covers part of the Exam STAM (Short-Term Actuarial Mathematics). It introduces frequency, severity and aggregate loss models, risk measures, coverage modifications and some parametric loss models with Exam STAM in focus. M 349R fulfills the VEE requirement for Applied Statistics and is a very interesting course. Regression and time series analysis are fundamental statistical tools that actuaries need and this course introduces them with a hands on application-based approach. I learned how to carry out linear regression, multiple regression, logistic regression as well as time series analysis using both R and SAS, which was a great addition to my technical skills.

This semester, Fall 2018, I am taking M 389P (Actuarial Statistical Estimates), M 389C (Actuarial Case Studies) and SDS 384-7 (Bayesian Statistical Methods).

M 389P covers the rest of the Exam STAM content. It introduces fundamentals of Bayesian inference, credibility, insurance and reinsurance coverages as well as ratemaking and loss reserving for short-term insurance coverages. These concepts are very useful in the actuarial work, as I have come to know after working as a Property & Casualty Actuarial Intern at Texas Department of Insurance this summer. M 389C is not geared towards any actuarial exams; however, it is arguably the most impactful actuarial course. This course introduces concepts and tools that you have to learn and use as a new actuary on the job, especially if you are working in the P&C industry. You work on two main team projects and various small assignments throughout the course. In addition to utilizing analytical and technical skills, you get to work on your presentation and communication skills as well. As a result, the learning curve is not so steep any more when you graduate and start working as an actuary. SDS 384-7 is a really good course if you like statistics but have not been

exposed to Bayesian statistics yet. Bayesian methods are being used extensively in the actuarial field nowadays and this course is a solid platform to learn fundamentals of Bayesian inference and it also dives into Monte Carlo simulations as well as Monte Carlo Markov Chain methods that are indispensable for modeling and predictive analytics.

For the Spring of 2019, which will be my last semester in the graduate program, I am planning to take M 389U (Actuarial Contingent Payments I), M 375T (Predictive Analytics) and SDS 384-6 (Design and Analysis of Experiments). M 389U covers part of Exam LTAM (Long-Term Actuarial Mathematics). It introduces actuarial models including survival model for life insurance, annuities and retirement plans. M 375T is a brand new course being introduced in spring of 2019 in order to cover the new SOA Exam Predictive Analytics. Predictive Analytics involves analyzing data in order to find solutions to real-world problems. It has been gaining a lot of traction in recent years and actuaries with different areas of practice have been employing predictive analytical tools in their work. I think this course will not only help me with the Predictive Analytics Exam but also provide me with the tools and skills to be a successful actuary. As far as SDS 384-6 is concerned, it was one of the very few interesting enough courses I could find that did not have time conflict with the other two courses. I am not sure how this course will directly impact what I will be doing as an actuary but it will certainly prove helpful if I decide to do research in the future.

Needless to say, my time as a graduate student in the actuarial science program at UT has been a highlight of my life. In addition to the courses that I have taken, my experiences with the Actuarial Science Club meetings and events, case study competition and career fairs have helped me explore the actuarial career and have prepared me to be a successful future actuary.

- Amit Adhikari

Editor's note: All M389\* classes meet with the equivalent M339\* class.

## **Troy Symposium hosted by WSIA**

As a recent transfer into the B.S. in Mathematics: Option 1: Actuarial Science major, much of the insurance industry was a mystery to me. The basic idea of insurance was easy enough to grasp, but when I delved deep into the inner mechanics, there was an entire world unknown to me.

Do we all know what an Actuary does within the insurance industry? Well in case you're in the large population who doesn't know, here's a little bit about what they do. Actuaries are in charge of pricing the risk that insurance companies inherently take on by putting their products in the market, and making sure that the business is still profitable in the long run. The work that actuaries provide is just a small sliver of what the insurance/risk management industry is in demand for.

The Troy Symposium hosted by the Wholesale Specialty and Insurance Association (WSIA) is a conference hosted twice a year. The one I attended was in Atlanta, early November. The conference was a two day event, and with flight and hotel covered by Gamma Iota Sigma. It was an awesome opportunity to network and learn some more about a side of the industry that is unknown to most (even actuaries). The first day consisted of a career fair with many potential employers looking for underwriting and wholesale brokering interns (more on that later). This was followed by a beautiful introduction presentation, into a delicious networking event. With an eventful night in between, the next day offered several guest speakers with topics on kidnapping and ransom insurance to the life of an underwriter.

From the beginning of the conference, my colleague Dylan Kan and I were introduced to a whole new side of the insurance industry that is not so well promoted here at the University of Texas at Austin. As the name of the association suggest, this subsection of the industry specializes in very specific high risk and (medium to) high severity property. If actuaries work on the macro level for insurance and consulting companies, the wholesale

specialty field works on the micro level. Actuaries oversee the company as a whole and set guidelines to what the company should follow, while people like underwriters deal with the individual policies that big companies are looking to enter to insure their capital.

Underwriters in this special section of the market evaluate and price the risk for capital such as beachside hotels, big concerts, multi-billion dollar stadiums. The job that underwriters do is a necessary one that is analytical but comes with more of a “businessy” role as well. These underwriters need to have relationships with retail agents (think allstate agent) and wholesale brokers to keep deals coming in; so for people who have a knack for attention to detail but also like to network an underwriting position could be for you.

Wholesale brokers work closely with underwriters, and retail agents as a middle man from the primary market to the very specialized side of the industry that wholesale and surplus lines is. The retail agent comes to the wholesale broker when they have capital that can't be written up in the regular market (hence the specialty), and the wholesale broker takes it into this hidden market to hopefully find an underwriter that is willing to write up whatever the retailer may need. A wholesale broker's main job is to keep relationships within the industry and have those connections that aren't available in the regular market. This kind of job is very sales orientated, and requires great attention to social dynamics and an ability to keep healthy relationships over the course of your career. The high-stress, high pace environment that wholesale brokers work in is well compensated based on the deals that you oversee, so pay might vary from year to year but the cap is comparable to what actuaries make. For you more socially oriented folks out there, this could be a career for you.

Although learning about this hidden part of the industry was very interesting, the best part was getting to meet my peers from around the country who were very interested in risk management and looking to develop a career in the wholesale surplus lines side of the

industry. You can never know too many people, and attending this Symposium really opened my eyes to the opportunities that risk management can offer. Now I haven't decided to change my career path just yet, but if being an actuary isn't what it seems like I want to do for the rest of my life (and let's face it, who actually knows what want or don't want until they're immersed for several years), I know the connections and friends I made there will follow me.

None of this could have been possible without Gamma Iota Sigma, a newly chartered risk management business fraternity here on campus. I urge anybody who may even be a little bit interested in risk management, or even just wants to expand their networking opportunities to join GIS. It is a well worth experience that not many other students have the chance to enjoy. And with the insurance industry in high demand for entry level positions, a certificate in Risk Management might prove beneficial to many people here. I know insurance doesn't sound very interesting at first hear, but I can guarantee that it is a well worth field that any business major, actuarial science major, economics major, and many more, can gain from.

- Anthony Gonzales

## Exam Preparation

Disclaimer: This article has not been sponsored by any study material company and the author has no experience with examinations offered exclusively by the CAS.

### 1. Which test to take?

Based on whether you have taken probability or interest theory or depending on how comfortable you are with each you should start with these two exams. The remaining do not need to be taken in a particular order, however the more common track is P/FM first, then IFM and so on.

### 2. Study Materials?

There are myriad options of study material available, some free, some are very expensive. I have personally used study manuals that the Actuarial Science club has purchased and a popular online practice test site. However, one can utilize their class' textbook, their class notes, and free practice problems posted on the SOA website. These can be very powerful resources for you to brush up on topics you may have forgotten.

### 3. Studying

I cannot overly stress how important it is to give yourself ample time to study and to make a study plan and schedule. But it is not good enough to simply make these plans, you must also have the discipline to stick to it. The general rule of thumb is 100 hours of study time for every hour of exam. So for a three-hour exam, one should study 300 hours. Though obviously some will find this to be excessive, and others may need more time. To start, you should go to the SOA website and study the exam syllabus. There is no other way to make a good study plan if you do not know of all the material covered. The syllabus even gives rough estimates of how much that topic the exam will be comprised of. This will help to determine what to focus on and what other topics may be skimmed if time is



short. You may also be surprised to see some material that hasn't been covered in class. Due to time constraints of the courses, this is likely and you will have to account for time needing to learn something new.

The best way to study is to practice. Practice, practice, practice, and then when you are done doing that, practice again. Doing practice problems in a setting that mirrors the testing environment, that is quiet and distraction free with a timer, is the best way to build confidence for the real thing. Also, because the exams require many formulas, do your best to not simply memorize them but to fully understand what is being stated. Straight memorization will only hurt you in the long run.

#### 4. Conclusion

These exams are challenging, however, with enough time and a strong enough work ethic anyone can pass them. Failing an exam is obviously unwanted but ultimately is okay. Few people pass every exam without failing at least once. One final tip is to remember to take advantage of any free time that you have. Any breaks, such as winter break, are the best times to study because there are no other academic commitments.

- Anonymous

## **Risk Management Certificate**

In this ever-changing world, risks are our only certainty. Though all businesses will encounter risk, it is how such risks are managed that will ultimately decide business success or failure. A current concern for many businesses is the task of dealing with newly arising risks (cyber risks, health care fraud, terrorism and identity theft) that have not been experienced and do not have current maintenance plans in place. While there are industries and professions that focus on topics of risk (such as actuaries and the insurance industry), all areas of business will inevitably have to manage risks effectively to maintain viability. Due to this necessity, UT Austin has developed a Risk Management Certificate enabling students of all majors the opportunity to learn more about the common risks they may face in their careers and how to account for them.

Certificates at UT are designed to help students achieve their educational goals by extending their curriculum to include other fields of interest. The Risk Management Certificate, specifically, was built to make students aware of the need to identify, prioritize and plan for the vast number of potential risks they will face throughout their future careers. Though students of all majors can gain important skills from this certificate, it is especially beneficial to those interested in filling a management position and for all current actuarial science majors.

The classes necessary to obtain the Risk Management Certificate offer insight into the world of risk management without all the formulas and numbers. Taking these extra classes (only two extra classes for actuarial science majors) can help students see risks through the larger lens of business and synthesize plans to prepare for them. In addition to the required classes, students need to take two elective classes (many of which are already included in the graduation requirements for actuarial majors). There are also classes regarding specific fields of risks that students can take if it correlates to their major such as ones focused on financial risks and conflict resolution in the workplace. In total, eighteen hours are required for the certificate:

- Introduction to Risk Management

- Property-Liability Risk Management and Planning OR Managing Employee Risks and Benefits
- Foundations of Accounting (already required for Actuarial Science majors)
- Foundations of Finance (already required for Actuarial Science majors)
- 6 hours of elective courses (fulfilled through Actuarial Science degree)

Actuarial students looking to go into the Property/Casualty industry would get a great deal of knowledge in that field by taking the property-liability course and the same applies to those pursuing the Health, Life or Retirement fields with the employee benefits course. Students needing extra hours to complete their degree plan can choose to pursue this certificate, thus making great use of the extra hours needed by learning information that will be extremely relevant to their future careers.

Risk management is not only applicable to students with majors relating to the field, but to students across all majors, both business and non-business. Risks exist in all futures and being able to properly and effectively manage such risks is the key to survival and growth. The new Risk Management Certificate at UT will help students identify future risks and plan accordingly as they progress in their careers.

- Noah Villalobos

## **Elements of Computing Certificate at UT**

Big Data. Data Analytics. These topics have increasingly been talked about as tech becomes more computational and data focused. According to Forbes, “Worldwide Big Data market revenues for software and services are projected to increase from \$42B in 2018 to \$103B in 2027, attaining a Compound Annual Growth Rate of 10.48%.” The computational and data driven world is growing.

The Elements of Computing certificate program offers students the opportunity to get a jump on data and the computing world. Its main goals are to equip students with a knowledge of computer science while supporting their study of other areas which require computational proficiency.

The certificate requires 18 hours of approved Elements courses which begin with two core courses and branch out to four upper division courses. These upper division courses include topics such as:

- Graphics and Visualization
- Networking
- Databases
- Game Development
- Security
- Navigating Cyberspace
- Data Visualization
- Software Engineering
- Data Analytics

Such topics as databases, data analytics, and data visualization play a big role in the actuarial world. With the adoption of Exam PA: Predictive Analytics in the SOA and practice areas in Predictive Modeling in the CAS, the actuarial profession is advancing the use of data analytics and predictive modeling in its work. Predictive models are becoming common place, transforming the way businesses look at problems and guiding business’ decisions.

As a student studying actuarial science and working to complete the Elements of Computing certificate, I have been able to use the skills and knowledge from actuarial science in some of my certificate classes, such as Data Visualization and Data Analytics.

When I was able to see the impact and results from using such methods in practical, real-life examples, it made learning the material very rewarding.

The Elements of Computing certificate program provides students with an overall knowledge of computer science and allows students to support interests and hone skills which they pursue. Students with a background in statistics and actuarial science can implement and see the impact of such ability on the data world.

- Paul Cessna

## A Quick Q&A

As a new actuarial science student, how has the major been presented to you, and how do you feel you fit in the major?

*Robert Deacon is a freshman business honors student at the University of Texas at Austin considering a second major in actuarial science.*

The defining feature of actuarial science is its obscurity. I cannot attest to the portrayal of actuarial studies in other colleges, but in McCombs, actuarial science as a career or major is given about as much thought as the lower intestine – with a comparable level of glamour. Due to its positioning in the College of Natural Sciences, few in business have even met an actuary, nevertheless describe their skill set. Advisors give vague answers to this unknown field. Peers' questions invariably lead to the dreaded: 'Why not just major in accounting?' It's a comfort to know they all mean well.

This has forced me to emerge from McCombs and venture forth from its warm cocoon into the outer reaches known by business majors as 'The Engineering Campus'. The reception has been largely warm, aside from the rigmarole of an internal transfer process. I have found people willing to answer my questions and contribute advice, some even within McCombs. Special thanks to BHP senior, Meredith Lutzak, BHP alumni Nicholas Franzese, Actuarial Science Club President Noah Villalobos, and Professor Maxwell for their time spent answering my questions on the programme, exams, and possible careers.

Once uncovered, the major has presented itself as a challenging and specialised path, yet one with great security and balance. This assessment comes from interviews, online articles and forums, and the personal experiences of my mother, an actuary and almost thirty-year veteran of the industry. Actuarial science comes off as a safe a rewarding path for the hardworking and analytically-minded individual; however, it is a path that demands commitment and thanks to its specialised nature, bends little in terms of career paths.

This is a shame for both the program and McCombs. While I understand the placement of actuarial science within the College of Natural Sciences on account of its mathematics-laden curriculum, the lack notoriety of the programme within McCombs is a shame. At other top actuarial science schools, such as the University of Wisconsin, actuarial science is within the business school, a major no different than management or marketing are here. From what I can tell, this logical to me considering the, from what I can tell, wide overlap between actuarial science and subjects in management information systems and finance. I do understand the desire for the programme to be set aside from business to emphasise its mathematical components and to discourage 'snakes' with no actuarial aspirations from taking spots in courses; however, I feel that a great opportunity in cross-pollination has been missed. While I believe actuarial science is suited well for the College of Natural Sciences, it should be better advertised within McCombs and possibly offered as an alternative BA degree path – enrolment open without a full internal transfer. The strengths of each should not be separated, but instead combined, to produce better graduates.

Going forward, I fully intend to pursue a degree in both business and actuarial science, using both to further my utility to a future employer.

- Robert Deacon

## Involvement and Experience with the CAS



This semester, I was nominated to be the CAS Student Ambassador for the University of Texas at Austin. The CAS Student Central Program offers building close relationships with CAS members and the university liaisons. Some of our responsibilities include coordinating logistical details with professors and CAS university liaisons, promoting upcoming presentations by the CAS

program, and increasing awareness of the CAS within the UT Actuarial community.

In November 2018, I was given the opportunity to attend the CAS Annual Conference in Las Vegas. The student ambassadors participated several of the general meetings with guest speakers. Most importantly, throughout the conference, the students learned more about their role, how to emphasize CAS more in their own university. Additionally, students were introduced to CAS members and associates. The members encouraged students to network and learn more about the current prospects of the growing actuarial science field. One topic that was underscored upon was the advancements of technology and programming in the industry and how data science has evolved to modern actuarial science.

Personally, I really enjoyed meeting peers from different universities. Unlike any other conference I have attended, the CAS conference allowed me to compare and contrast the actuarial programs offered at different universities. As I connected with these students, I also got more insight on how to implement the CAS program within our university. I hope to attend more CAS programs in the future and also am very thrilled to host our university liaisons in spring 2019.

- Sheetal Hari



# Fall 2018 Actuarial Scholarship Honor Roll

## **Endowed Scholarships**

Kim Lee Endowed Scholarship in Actuarial Studies (Through Texas Exes)

Keyi Ma

Mark and Pamela Callahan Endowed Scholarship in Actuarial Studies

Anqi Lou

James Morris Dial Endowed Scholarship in Actuarial Studies

Tomas Venegas

Bruce Fuller Jr. Endowed Scholarship in Actuarial Studies

Kuang Li

John S. Rudd Jr. Endowed Scholarship in Actuarial Studies

Warren Bello

Eugene Wisdom Memorial Endowed Scholarship in Actuarial Studies

Lingyun Gu

David Hu

## **Recurring Scholarships**

Actuaries' Club of the Southwest Scholarship

Hunain Naeem

Jonathan Ouh

Milliman Standard of Excellence Scholarship

Paul Cessna

New Era Life Insurance Actuarial Scholarship

Victoria Li

Lihan Ye

Bo Yu

Rudd and Wisdom Actuarial Studies Scholarships

Lauren Case

Paul Cessna

Meridith Lutzak

Shirel Miller

Alper Orkun

Carley O'Sullivan

Steven Place

Evan Shrestha

Tomas Venegas

Southwest Actuarial Forum

Shifan Hu

USAA Life Scholarships

Cole Rank

Yiran Zhang

Zhijun Zhang

USAA Property and Casualty Scholarship

Amit Adhikari