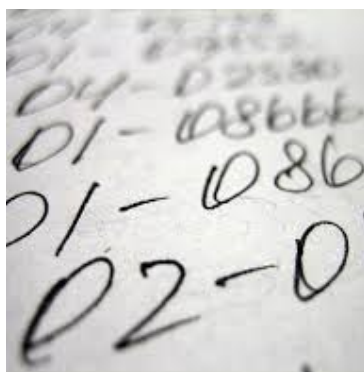


# Risky BUSINESS



## In This Issue:

Changes to the SOA Exams

Emergence of Predictive Analytics

Effects of Technology on Insurance

An Interview with Dr. Shinko Harper

*...and More*

## A Message from the Desk of the Editor

Welcome to another issue of Risky Business, the University of Texas at Austin's official actuarial newsletter! The end of the semester is almost upon us, and we here at Risky Business are excited to provide some light reading and help students take a quick break from cramming for their final exams.

Our Fall 2016 edition includes articles on essential Actuarial Science Club resources and a useful graphic for aspiring actuarial students. We also have an insightful interview with our very own Dr. Shinko Harper!

This year has been especially hectic with upcoming official actuarial exam changes as well as major shifts in the industry environment. We have included articles on interesting and practical topics including the Affordable Care Act, predictive analytics, and technology trends. As

always, we have included recognition for this semester's outstanding scholarship recipients.

I would like to recognize the authors that have contributed so much of their time and effort to creating this semester's articles. An enormous amount of feedback, revisions, and emails have been flying back and forth over the past few months. Let's give a big hand to Angel Vergara, Anne Nguyen, John Guttman, Kalyani Limaye, Neri Maldonado, and Riddhi Kumar for providing amazing content in this edition.

Catherine Song and Preethi Fernandez also did a great job taking over the graphic design and compiling the articles with an aesthetic look. There was not a lot of time to format after final articles were completed, but you two nailed it. This was the first opportunity to work with a newsletter for many on this

year's Risky Business team, but they all did fantastic jobs and exceeded my expectations.

Last but not least, I would like to extend a huge thanks to Mark Maxwell, Actuarial Studies Program Director, and Shinko Harper, Lecturer, for providing an abundance of article suggestions and interview content. Angela Fang also played a key role by jumping into the office of the Risky Business Liaison this semester. She has helped connect the ASC with the actuarial faculty in building this semester's newsletter.

This is just my first semester as the Editor for Risky Business, and I look forward to what our actuarial program, faculty, students, and newsletter team have to offer in the future. Thanks for joining me on this exciting journey, everyone.

- Edward Zhao

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Remember to check out our  
“Actuarial Club at UT” group  
page on Facebook!

It's a great place to join study  
groups with other actuarial  
students, get advice on classes,  
and share exam preparation tips!

## SOA Exams

### Upcoming Changes to the Actuarial Exams

Every so often, the SOA changes its requirements for professional certification in order to help actuarial students develop skills relevant to the ever evolving market. To aspiring actuaries, these changes may be difficult to understand, but the SOA has already released information to aid students in their exam preparation. In upcoming years, there are two rounds of changes that candidates should be aware of.

The first will affect only Exams FM and MFE. Beginning in June 2017, Exam FM will no longer cover derivatives markets material. Instead, this material will be assessed in Exam MFE. The scope of the MFE syllabus, however, shouldn't become

unmanageable after the changes take place, as some mathematically sophisticated topics such as Brownian motion, Ito's Lemma, and stochastic calculus have been omitted. Students who have received credit for Exam FM by April 30th, 2017 and/or MFE by March 31st, 2017 will retain their credit.

These changes may affect when students plan to sit for Exam FM. Currently, M329F covers most of the material on Exam FM, and part of M339D covers the remaining derivatives markets material. Come June 2017, Exam FM will not contain any material from M339D. Therefore, students planning on taking FM on or after this date should do so soon

after completing M329F. That being said, students should not put off taking Exam FM in hopes of avoiding derivatives markets material, as it will be assessed in Exam MFE.

The second round of changes may appear more daunting initially. These changes apply to any candidate who has not completed his or her ASA by July 1st, 2018, and they will affect both the exam and VEE requirements for ASA certification. However, all VEEs and exams completed before the changes are enacted count toward the new requirements. Most of the changes are minor, but there are substantial additions — two new exams, Predictive Analytics and its sup-

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porting prerequisite, Statistics for Risk Modeling (SRM).

Broadly speaking, predictive analytics refers to processes that use data and statistical algorithms to make future predictions. While its applications are varied, some include anticipating risks, forecasting inventories, and projecting revenues. SOA President Craig W. Reynolds suggests that the growing, widespread need for predictive analytics experts benefits actuaries by providing them the opportunity to apply their “skills and expertise inside and outside of the insurance industry.”

The Predictive Analytics exam will be administered differently than previous exams. Instead of written or multiple choice questions, the exam will be project based. While the details are far from finalized, the exam might require candidates to use computer programs such as Word, Excel, and/or R to work with data and generate reports. Students may also have to complete e-Learning modules as part of the requirement.

The Statistics for Risk Modeling exam will serve as a formal prerequisite for Predictive Analytics. However, candidates who have earned

VEE credit for applied statistics under the current system will receive transition credit. For UT students, this means that taking M349R and receiving at least a B- before July 1st, 2018 will exempt them from the exam. Professor Maxwell recommends all actuarial students take M349R. In general, he urges students to continue their exam and VEE progress as normal. Dr. Maxwell affirms that “the more [students] do now, the better off [they’ll] be” regardless of future changes.

In addition to adding new exams, the SOA will also modify existing exams. Exams MFE, C, and MLC will no longer exist under the new system. In their place, candidates will take “Investment and Financial Markets,” “Long-Term Actuarial Mathematics,” and “Short-Term Actuarial Mathematics” respectively after July 1st, 2018. When asked about the severity of the exam changes, Dr. Maxwell stated that the draft learning objectives released by the SOA indicate that, except for some new defined benefits material, most of the topics are exactly the same. Some topics have just been moved to different exams. In response to the changes, the material from the syllabi for M339U, M339J, and M349P will be

shifted and rearranged to suit the order of the new exams in later semesters.

Two of the three VEEs will also change. Accounting material will be added to the finance requirement. Mathematical statistics will be replaced by applied statistics. Students who have received a grade of B- or better for courses satisfying the current requirements before July of 2018 will receive transition credit.

While there appear to be a litany of changes, it’s important to stay calm. All VEEs and exams completed before the change will count under the new system. In fact, some candidates may find they have a greater percentage of requirements completed after the changes take place, so continuing with exam progress is crucial. Most of the exam topics cover the same material that talented UT professors have been teaching and perfecting for semesters. It’s important to keep in mind that the added content strives to equip students for diverse career paths and the challenges they’ll face within them.

- Riddhi Kumar







## + An In-Depth Interview

### Thoughts from an Actuarial Professor at UT Austin

*Risky Business* would like to welcome Dr. Shinko Harper, a UT mathematics lecturer who teaches courses M 329F, M 339U, and M 339V.

Dr. Harper majored in Mathematics at the University of Memphis for her undergraduate and master's degrees before coming to UT to attain her Ph.D. in 1997. Harper's experienced background in academia gives her critical insights into how to succeed in the classroom. This interview focuses mainly on her teaching methods and advice for actuarial students.

**Q: What do you like best about being a UT professor?**

A: There are two. One is absolutely the interaction with the students. The more I'm teaching here at UT, the more satisfying it is when I find that the students basically took off with the material and came up with solutions that I didn't expect or created solutions that the textbook doesn't show but are absolutely correct.

The second part is the question: can I keep on learning? Yeah, I get to! What more fun can you have than to be able to keep on learning and still be paid for it?

**Q: How did you begin teaching actuarial courses at UT?**

A: Dr. Maxwell sent out an email to the entire faculty back in 2010. He asked, "Is there anybody interested in teaching Interest Theory?" I think that was around the time that the actuarial science program was growing rather rapidly. They were increasing the number of sections they were offering for M329F (ACF329 at the time) and I think that's why Dr. Maxwell sent out that email. And I thought, why not? Everyone has a mortgage, I have a mortgage. There are bonds and bond elections – if I had no idea what a bond is, how can I make an informed decision? I need to learn these things, and here I still am. It feels like the kind of stuff that every adult should know.

**Q: How do you prepare to teach a course you have not taught before, such as M339V?**

A: The V class is the one I've taught just once. The preparation for teaching V started about two years before I actually taught it. When I had that conversation with Dr. Maxwell, he asked, "would you like to teach V?" I said, well, yes, eventually. I thought he was going to give me a 1 year deadline and instead he gave me 2 years. Then I thought, uh-oh, does this mean I stepped into something I wasn't really prepared for? It actually did take me that long to feel like I learned enough that I could possibly teach it. When I first got the ACTEX study manuals for Exam MLC, it was 2

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volumes, which then later turned into 3 volumes. I worked through most of the ACTEX study manuals. I worked through as much as I could of the problems in the Dickson, Hardy and Waters textbook. I also bought a few more textbooks through Dr. Maxwell, and I've worked through many of the exercises in those as well. It took me a good chunk of two years working through most of the summers and winter breaks. It took me that long to get comfortable enough where I thought that I could teach V.

**Q: Do you think you'll continue to expand to other courses in the future?**

A: I think I want to teach M339V a few more times before I go expanding to anything else. Earlier today, I was sitting in Ms. Walch's case study class. The instructors go to observations of each other's classes and we give each other feedback on our teaching. I sat there saying "oh gosh, there's still so much I don't know." I would hope that eventually, I would be allowed to teach more and more classes, but we'll see. That's at least partially dependent on the department's needs.

**Q: Do you encourage group work in the classroom?**

A: I don't assign many group projects, but I try to get students to work together in the classroom. I often have students working in small groups of 2 to 4 people. I also try to get them to go to the board to write, share, discuss, and present solutions. I'm definitely seeing presentation skills improving in the classroom. It's a fact of life that if you're going to work in a corporation, you've got to work with other people. Communication with other people is a necessity and so I try to spend as much class time as I can to get students to work with each other or discuss problems.

To be honest, I think people learn far more by interacting with each other. I might be a decent lecturer, and some people might be able to learn with just that. Certainly I might be able to make a great presentation of an exercise and a particular solution for it, and the students would understand the solution. They'll write it on the test, get full credit, and be satisfied. That kind of knowledge is just like: I saw it, I reproduced it, and I'm done. But when the students start to talk to each other and present to each other, they make mistakes, and they're good mistakes. They can discuss why is it wrong, not just that it is wrong. It's not wrong because it produces a wrong answer, it's wrong for a reason. And in the process of discussing those reasons, the students have a much better understanding of all the principles of how things fit together and extend on the ideas. They teach each other! Seriously, they are much better teachers with each other than I am with them.

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**Q: What are your expectations for your students?**

A: I expect them to do the pre-class preparations. I know there's what I expect and then there's reality, but for the best learning to occur in class, they have to have done enough work ahead of time so that they're ready to work in class. There's a lot going in their lives and it's difficult, but you want to use the time spent in class in the best possible way where you're doing more than just copying down notes. Please prepare before coming to class! Read what I assigned and work through the examples. Even if all you have is a vague idea of what's about to happen, I think it makes a huge difference in how productive the 75 minutes you spend in class is going to be. Time is precious for all the students. I know they're all busy, but that 75 minutes can be used for learning or the 75 minutes can be used just taking notes. That's the student's decision.

**Q: What's your best advice for students?**

A: Don't think of the basics as being a waste of time. Time spent on understanding how things work is not a waste of time. In the long run, being able to understand what the things are to the point where you can describe the details in plain English is a really good use of time. The formulas look horrible, the notation looks horrible; but you have to realize that all those notations are actually just shorthand for long descriptions in English. There's a reason why they're written that way. What does this policy do? When are the payments? The formulas and notations turn into a shorthand of what you would have tried to say without having to write the description all out in English.

And don't be afraid to make mistakes! The mistakes are the opportunities to think about how things work. Those are the opportunities to think: what really is the most important idea behind this problem? Don't be afraid to make the mistakes, and when you make the mistakes, ask yourself: "why is it wrong?" Try to understand what the principle is that you just didn't quite get. It's not just: "it didn't match the back of the book." That's not what is important. I don't work in industry, but I can tell you that corporations don't have a textbook with all the final answers in the back. You have to make the mistakes, figure out what's wrong, then make the adjustments. That will lead you eventually to a meaningful solution and solid understanding of the material.

**Thank you for sharing your experience and expertise with us, Dr. Harper!**

***Interviewed by Edward Zhao***

## + Affordable Care Act Impact of the ACA

The Affordable Care Act has always been a topic of controversy with every individual having a distinct opinion on what it has achieved or failed to achieve for the nation. This stands out now more than ever against the backdrop of the recent presidential election, in which the two candidates had fiercely contrasting views on the subject. What cannot be denied however, is the fact that since its launch in 2010, it has had a significant impact on healthcare providers, healthcare consumers, and the economy in general.

Going back to the pre-Obamacare period, it can be observed that the American healthcare system seemed rather broken. It was hard for people in need to find coverage, and the ones who could had difficulty paying for it. What Obamacare essentially did was make health insurance mandatory. It also prohibited insurers from refusing coverage or charging higher premiums to those with pre-existing conditions. To many, after long years of underinsurance and inefficient fund usage, the idea of universal healthcare came as a paradigm shift.



Today, several million previously uninsured citizens have access to good quality and low cost insurance through Medicaid expansion, healthcare exchanges, and subsidies. The act's provisions ensure that you cannot be dropped from coverage when you get sick, and that women can't be charged for healthcare any more than men are.

The ACA has affected hospitals and the medical technology industry as well. According to a report by the Kaiser Family Foundation titled "How are Hospitals Faring



Under the Affordable Care Act?", hospitals in Medicaid expansion states saw increased Medicaid discharges, increase in Medicaid revenue, and decreased cost of care for the poor in comparison to non-expansion state hospitals. The reform benefits the medical technology industry by causing a sizeable increase in the demand for products. However, the authorized medical device excise tax has had slightly negative effects on investment, profits and research.

Although most of us may not be fully aware of its provisions, The Affordable Care Act is good news for students. The law also allows young adults to stay on their parents' plan till the age of 26, after which they can purchase their own insurance.

Why then, is Obamacare criticized by some? In order to provide nationwide coverage at low cost, someone has to pay for it. The law imposes taxes on high income groups, large corporations and the healthcare industry to collect the required funds. Under the individual mandate, even the consumers who do not want insurance, either have to buy expensive coverage, or pay a fine for refusing to. One argument is that this goes against an individual's freedom of choice. The employer mandate is a similar decree imposed on firms which has aggravated people against the reform.

The Affordable Care Act has aided countless uninsured sick people and helped subsidize insurance. But like most reforms, it is a double-edged sword. The law is believed to have stifled innovation, reduced wages and added to the national deficit. The president-elect is going to have to think over the big question of "do the costs outweigh the benefits?" in order to take a step towards changing America's healthcare system.

-Kalyani Limaye



## + tips to know

### ASC Study Resources

Becoming an actuary is not an easy task; studying for a SOA/CAS exam with a less than 50% pass rate can be very intimidating to do on your own. Fortunately, the Actuarial Science Club (ASC) offers assistance in studying for professional exams as well as a network of people that can help with any actuarial science classes you may be taking currently. The specific study resources available to you upon paying your dues are: PCL study time, the buddy system, and access to an exam manual library.

Sometimes it can be hard to study for upper-division math classes on your own, or you just need a place to study that will help keep you focused. Thankfully, the ASC reserves a study room in the PCL multiple times a week. The open study room is always posted on the Facebook group far in advance, so you can plan your schedule around it with plenty of time. Here you can get to know students that may be in the same class as you and collaborate on homework, or you can study for the professional exams with people that can help you nearby. In addition to this weekly time, there are tutors in specific study rooms who have passed multiple professional exams. If the PCL is not an ideal meeting area for you, some of the tutors make themselves available via text to meet up elsewhere as well.

If you are not sure where to start with studying for the exams, the buddy system allows you to pair up with someone who is preparing to sit for the same professional exams as you. As soon as you join the ASC, you take a short poll when you sign in that asks you what professional exams you are preparing for. After filling this out, you are matched with someone who you may study with. Nothing is set in stone until you approve of it, of course. Since you are studying for the same exams, odds are that you are taking the same class. While you may not be in the same section of that class, you can still work on homework problems together and draw connections between what you are being taught in class and what you may be struggling with in the sample exam problems.

Finally, one of the most useful resources the club offers is access to a study manual library. One of the most

important ways to study for the professional exams is to practice as many problem sets as possible for the specific exam you are studying for. Buying your own manual can cost more than \$100, so this rental service can be very cost efficient. All you have to do is contact one of the officers, and they will help you rent what you need for a small deposit that will be refunded to you as soon as you return the manual in the same condition you received it in.

In addition to study resources, the club also offers several opportunities to meet with companies in a less formal way than career fairs. More specifically, there are bowling nights and informal dinners hosted by companies multiple times per semester. If you feel like your resume needs more depth, there are weekly opportunities for club members to do community service that you can add to it. Furthermore, club officers are more than happy to help you with resume editing. In fact, they encourage you letting them help you edit your resume so much that during the first few meetings, they will give you a discount on your dues if give them your resume as well.



Raising Cane's with Willis Towers Watson.

All of these perks are fantastic, but my favorite part is definitely the social aspect of the club in which we have essentially formed this information hub useful to basically anyone at any point in their degree. People in the Actuarial Science Club have taken or need to take the same classes as you, so by reaching out to fellow club members you can plan and coordinate your schedule better than you would have on your own.

- Neri Maldonado



# Predictive Analytics in Actuarial Science

Predictive analytics is the use of large amounts of data to make predictions of future probabilities and trends. In other words, it is the use of data to create predictive models. The technology that makes predictive analytics possible are cloud systems and automated data storage.

Actuaries use data analyses and modeling techniques on large data sets to discover predictive patterns and relationships in business. By using analytics, actuaries can create predictive models. They do this by



collecting data from their servers, and a team of actuaries then uses that data to create meaningful graphs. Health actuaries can use those models, for example, to identify people who are more likely to use the emergency room multiple times per year. They use health plan membership, claims, and care management data to calculate predictive factors for their frequent use of the E.R. Actuaries also use predictive analytics for identifying high-risk patients for medical management, and they use predictive models to normalize populations. The Society of Actuaries has sponsored professional development courses in Advanced Ana-

lytics, and the CAS is also promoting actuaries in predictive analytics.

In the life insurance industry predictive analytics is fairly new, as it is in other industries, and it is used in the field of experience studies.

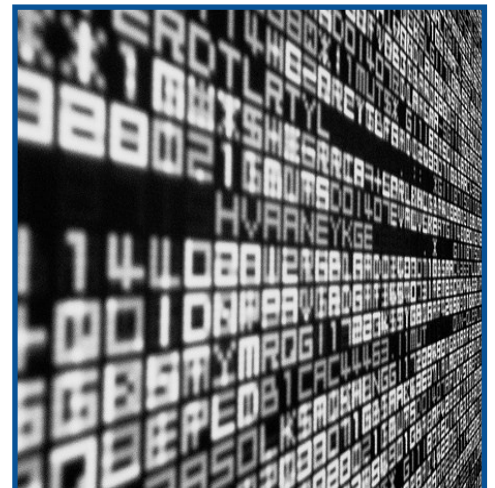
“Actuaries also use predictive analytics for identifying high-risk patients for medical management, and they use predictive models to normalize populations.”

With predictive analytics, life insurance actuaries are able to use more data than with old approaches to this field. This new approach examines the relationship between variables on an all-else-equal basis which is a key component for predictive analytics. Some of the steps to this process include determining the target varia-

ble which will be predicted, data collection, initial factor analysis, model building, model validation, final calibration, and implementation.

The best use that a student can make of the resources at UT to prepare for predictive analytics is to engage in courses that offer predictive modeling, generalize linear models and time series. There are several statistics and math courses which cover some of these subjects. M349R, SDS 358, SDS 348 and SDS 374E are some of these courses. For students planning on pursuing an advanced degree, the McCombs School of Business offers a Master of Science in Business Analytics. The disciplines for the degree are applied statistics, applied mathematics, computer science, optimization, consumer behavior, risk management, operations research and decision theory. Alternatively, students can find online courses on Big Data and predictive analytics on edX.

- Angel Vergara



# Technology Trends in Insurance



In an article titled “33 Million Americans Still Don’t Have Health Insurance” published by FiveThirtyEight, writers Anna Maria Barry-Jester and Ben Casselman found that, in 2014, nearly a fourth of all uninsured Americans were “Young Invincibles:” young adults ages 19-34, or millennials. This is a historically consistent finding; recent college graduates typically do not purchase health insurance due to lack of coverage from their employer or because they feel that they don’t need insurance -- hence the “Invincible” description. The latter issue has sparked a significant amount of creativity from insurance companies. As outlined by Joseph Jaafari on propertycasualty360.com, recent trends in the way insurance is offered point to a more technologically advanced and user based system – exactly what millennials love.

One of the ways insurance companies are incorporating technology into the consumer side of health insurance is through the use of telematics: devices that record information, then stream it wirelessly for analysis. Life insurer John Hancock has helped lead the charge on telematics by offering discounts on premiums for customers that use a FitBit and stay active. As millennials continue to rely on automation for

Life insurer John Hancock has helped lead the charge on telematics by offering discounts on premiums for customers that use a FitBit and stay active.

It’s no secret that millennials, more than prior generations, avoid certain activities that have inescapable inconveniences. Whether it be reading the terms and conditions on a contract, or following the instructions for a new piece of technology, or shopping at stores rather than online, we prefer more efficient ways to acquire information. Insurers, especially on the P&C side, have picked up on this by offering apps that take care of nearly the entire claims process. For example, State Farm now offers a Pocket Agent app that allows the user to make payments, file claims, and get quotes without having to contact an agent. In addition, many insurance companies have transformed their websites and made them much more user-friendly and navigable, reducing the need for the customer to keep track of paperwork and information.

In an effort to stay relevant among millennials, improve customer satisfaction, and streamline payments, insurance companies have been forced to embrace technology and user friendly means of offering insurance. If only insurers could somehow find a way to offer benefits to customers that watched a lot of Netflix, then perhaps all millennial insurance issues would be solved.

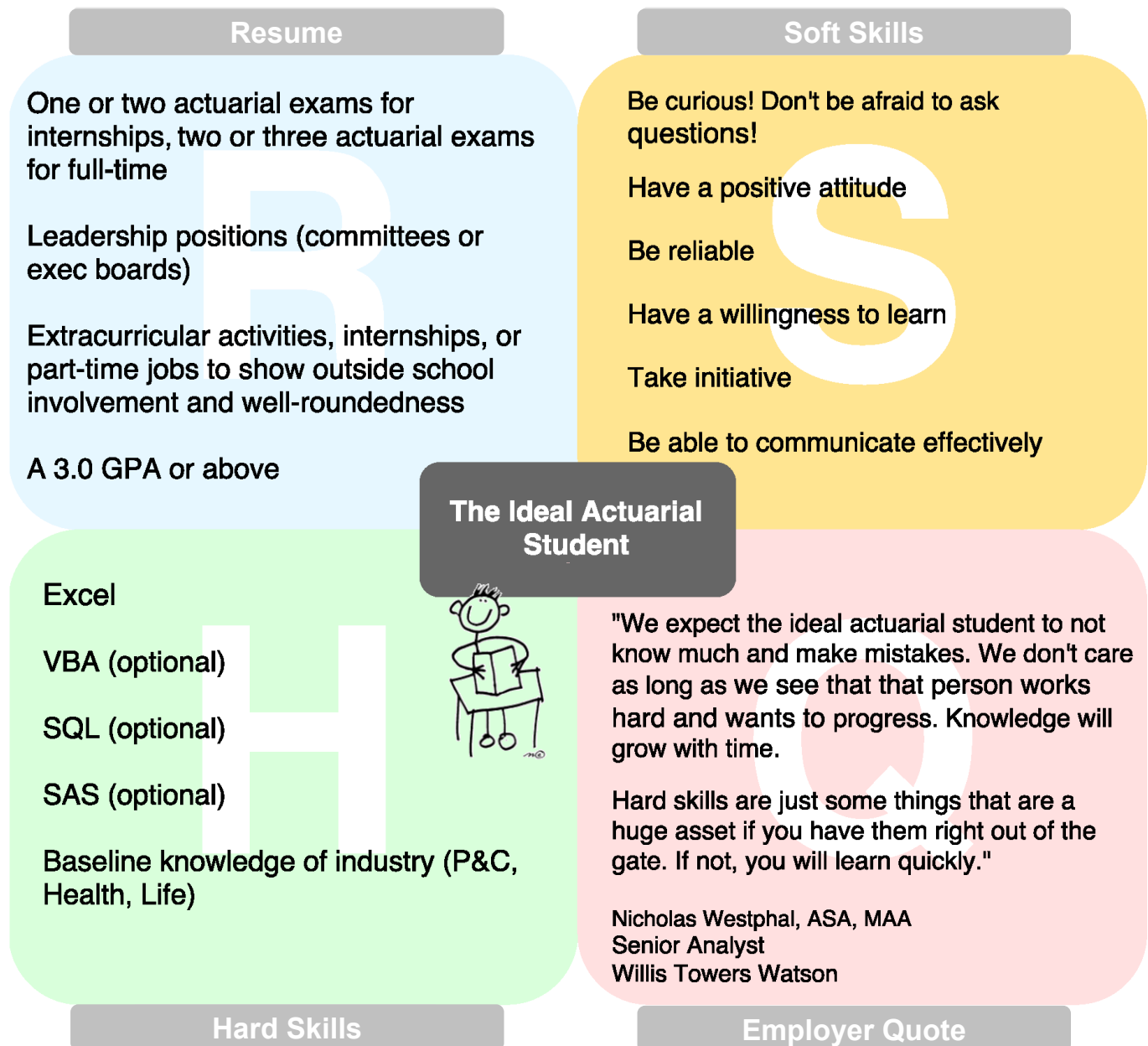
- John Guttman



routine procedures such as exercise, insurers can look to seize the opportunity and provide insurance benefits to previously uninterested college graduates. By doing this, millennials may have more incentive to commit themselves to a policy that aligns with their interests. One can hope for a reality in which insurers provide benefits to users that log large amounts of hours walking around and playing “Pokémon Go.”

# The Ideal Actuarial Student

A one-stop visual diagram that incorporates all of the abilities and accomplishments that employers look for in a UT candidate!



Created by Anne Nguyen

## Probability, P

Madason Donaho, Junior

Riddhi Kumar, Junior

## Financial Mathematics, FM

David Hu, Sophomore

Meredith Lutzak, Sophomore

John Guttman, Junior

Sahit Reddy, Junior

Angela Fang, Senior

Ryan Gold, Senior

Tingting Lin, Senior

## Construction and Evaluation of Actuarial Models, C

Nancy Nguyen, Senior



Email your recent exam progress to Risky Business to have your accomplishments recognized in next semester's edition!

[Risky.business.editor@gmail.com](mailto:Risky.business.editor@gmail.com)

Please include your full name, year, recent exams passed, and candidate ID number.



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Kim Lee Endowed Scholarship in

Actuarial Studies

Elin Kim

John S. Rudd Jr. Endowed Scholarship in

Actuarial Studies

John Guttman

Mark and Pamela Callahan Endowed  
Scholarship in Actuarial Studies

Meredith Lutzak

Bruce Fuller Jr. Endowed Scholarship in

Actuarial Studies

Dani Diehl

James Morris Dial Endowed Scholarship in

Actuarial Studies

Samantha Hart

Eugene Wisdom Memorial Endowed

Scholarship in Actuarial Studies

Robert Jurgens

## Recurring Scholarships

Actuaries' Club of the Southwest Scholarship

Angela Fang

Milliman Standard of Excellence Scholarship

Elin Kim

New Era Life Insurance Actuarial Scholarship

Liyu (Michael) Huang

Retirement Horizons Actuarial Scholarship

Xinyun Zhang

David Hu

Rudd and Wisdom Actuarial Studies  
Scholarships

Madason Donaho

Riddhi Kumar

Jimmy Nguyen

Lauren O'Neal

Steven Place

Justin Park

Troncoso Consulting Group Scholarships

Sungjin Cho

Seungjoon Kim

USAA Property and Casualty Scholarship

Alex Zhang

USAA Life Scholarships

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