# A University of South Carolina Student's Guide to Becoming an Actuary

University Of South Carolina Honors College
Kara Sulzer

# Table of Content


## **Chapter 1:** The Basics

4. What is an Actuary?
5. How do I Decide if Actuarial Science is Right for Me?
6. Actuaries' Work Environment
7. Where are Actuaries Located?
8. Salaries of Actuaries

## **Chapter 2:** Education

17. What Should I be Studying in College?
18. Technical Skills
19. VEE Certifications

## **Chapter 3:** Exam Process

24. Preliminary Exams
28. Preparing for Exams
30. SOA vs CAS Exams

## **Chapter 4:** Starting your Career as an Actuary

33. How do I Find an Internship?
35. Actuarial Development Programs
36. How do I Make a Competitive Resume?
38. Interview Preparation

## **Chapter 5:** Resources for Actuarial Students

40. USC Campus Resources
41. External Resources

# Chapter 1:
## The Basics

What is an Actuary?
How do I Decide if Actuarial Science is Right for Me?
Actuaries' Work Environment
Where are Actuaries Located?
Salaries of Actuaries

# What is an Actuary?

Actuarial science is a growing and rewarding career offering generous compensation and job security. Several reporters such as CNN Money and US News and World Report described the profession as a top rank career and agree that "few other occupations offer the combination of benefits that an actuarial career can offer." [I]

Actuaries manage risk. They are the analytical key in financial programs; using numbers to estimate the probabilities of events occurring in the future and developing methods to reduce the amount of unfavorable events and decrease the impact of these events, actuaries are an important piece of many organizations.

The day to day life of an actuary can vary dramatically by field, by actuary, and even by day. Actuarial consultants have the most variability; traveling to clients regularly, the activities of actuaries in this field tend to vary depending on client needs. Insurance pricing actuaries, however, have a more predictable schedule and focus on pricing insurance products correctly to meet profitability goals. [II] These are just a couple of the many fields in which actuaries work.

I. ("What Is an Actuary | A Top Ranked Job," n.d.)
II. ("What do we do | A Top Ranked Job," n.d.)

# How do I Decide if Actuarial Science is Right for Me?

- **Do you enjoy Mathematics and Finance?** As an actuary, one will be sitting for several exams which will require high level knowledge of Finance, Mathematics, and Statistics, so it is important for a potential actuarial student to be interested in these subjects. [I]
- **Are you interested in broadening your technical skills?** In addition, actuaries utilize technical skills such as coding languages, Visual Basic for Applications (VBA), Excel, and Access daily. While these skills are usually learned on the job, a potential actuarial student must be willing to learn these programs. [I]
- **Are you a problem solver?** Actuaries work on complex problems daily and must be willing to face challenges. Actuaries possess essential analytical skills that are used in their job everyday. [II]
- **Do you have strong communication skills?** Many times actuaries must explain their work or findings to business partners in different departments. Often, these business partners do not have the background in math and statistics that an actuary has, so it is important that a potential actuary has the ability to explain concepts in a way that others understand.
- **Other skills include:** project management, creativity, independence, and teamwork.

I. ("Is This the Career For You? | How Do I Get Started?" n.d.)
II. ("Should I Be an Actuary? (The Why YES and the Why NO)," 2018)

# Actuaries' Work Environment

There are many different industries actuaries work in. The most typical industries are the insurance industry and the consulting industry, as well as private corporations.

- **Insurance Industry**: calculating expected claim costs, pricing products, calculating reserves, and running analysis on business are some of the main functions of an insurance actuary
- **Consulting Industry**: varies depending on the field and client needs, can be designing benefit plans and pensions, evaluating assets and liabilities, and anything in between
- **Private Corporations**: analyzing business and evaluating risk to help the company make strategic decisions

While the majority of actuaries work in the industries above, many other entities hire actuaries as well. These include:

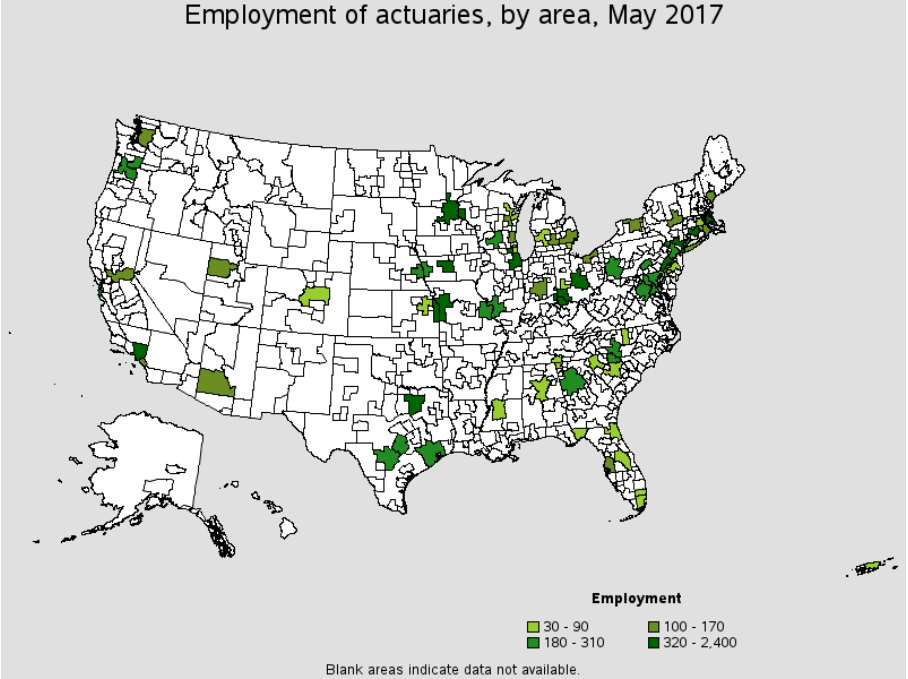
- Government
- Public Accounting Firms
- Banks and Investment Firms [I]

As of May 2017, the Bureau of Labor Statistics reported that 86% of actuaries work for insurance carriers. [II]

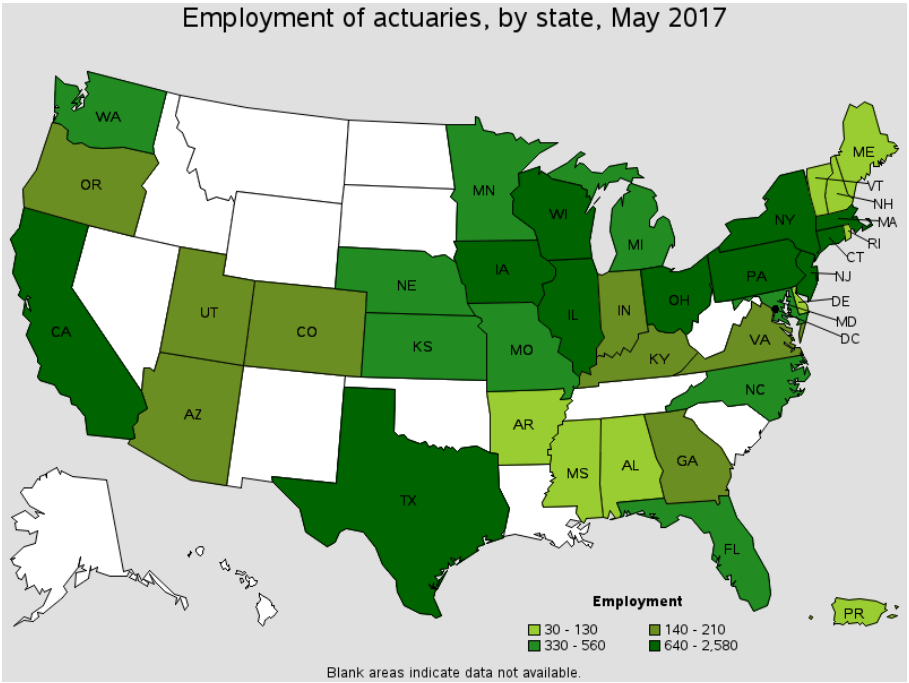
I. ("Where Do We Work?" n.d.)
II. ("15-2011 Actuaries," 2017)

# Where are Actuaries Located?

Most actuaries work in select industries. Therefore demand for actuaries tends to be concentrated to metropolitan cities. Below is a map, produced by the Bureau of Labor Statistics, showing which states have the highest employment level for actuaries. They reported that New York employs the most actuaries of any state, followed by Pennsylvania, Illinois, California, and Ohio. [I]




The map above shows which metropolitan areas have the highest employment level of actuaries. According to the Bureau of Labor Statistics the New York/ Jersey City/ White Plains area employs the most actuaries, followed by the Boston/ Cambridge/ Newton area, the Chicago/ Naperville/ Arlington area, the Hartford area, and the Los Angeles/ Long Beach/ Glendale area. [I]




I. ("15-2011 Actuaries," 2017)

# Salaries of Actuaries

Another difference in fields of actuaries is between the salaries they take home. In May 2017, the Bureau of Labor Statistics reported that the Median yearly salary of actuaries is $101,560, but this varies across industries. While actuaries working in finance and insurance industries usually have the highest salary, the type of insurance industry also has an effect on pay. [I]

DW Simpson, the largest actuarial recruitment firm, conducted a survey comprised of actuarial salaries by field in 2018. This survey focused on casualty actuaries, health actuaries, life actuaries, pension actuaries, entry level actuaries, nontraditional actuaries, and international actuaries. [II] Below are displayed the survey results of salary ranges per number of exams and years of experience. The exam process will be discussed in chapter 3. Visit https://www.dwsimpson.com/salary to explore graphs of this data in more depth!

In the following tables, you will see salary ranges that represent the 10th and 90th percentile for each exam passed and year of experience.

I. ("15-2011 Actuaries")
II. ("2018 Actuarial Salary Survey by DW Simpson")

# Casualty Actuary Salary

Property and casualty actuaries work in insurance areas such as reinsurance, auto, homeowners, medical malpractice, and workers compensation. [I] According to the 2018 Actuarial Salary Survey conducted by DW Simpson "The P&C (Property and Casualty) market consistently has the **highest senior level salaries**, and the demand for casualty actuaries remains consistent throughout various outside market conditions." [II]

| Casualty | < 1 yr | 1-3 yrs | 3-5 yrs | 5-7 yrs | 7-10 yrs | 10-15 yrs* | 15-20 yrs* | 20+ yrs* |
|---|---|---|---|---|---|---|---|---|
| 1 Exam | 48-65 | 54-72 | 55-80 | | | | | |
| 2 Exams | 50-71 | 57-81 | 58-83 | 60-92 | 69-100 | | | |
| 3 Exams | 54-77 | 62-87 | 66-100 | 79-106 | 85-110 | | | |
| 4 Exams | 58-82 | 63-91 | 71-107 | 82-109 | 87-120 | 94-141 | | |
| 5 Exams | | 65-95 | 73-111 | 84-118 | 88-132 | 100-159 | | |
| 6 Exams | | 70-97 | 76-116 | 88-126 | 95-151 | 102-167 | | |
| 7 Exams | | 72-99 | 85-118 | 94-135 | 99-162 | 107-172 | | |
| ACAS | | 85-112 | 90-138 | 98-154 | 100-165 | 110-210 | 124-273 | 143-360+ |
| FCAS | | | 114-166 | 116-190 | 120-235 | 144-369 | 158-447 | 177-556+ |

The chart above is a screenshot from the DW Simpson Salary Survey.

I. ("What Is a Property and Casualty Actuary?" n.d.)
II. ("2018 Actuarial Salary Survey by DW Simpson," 2018)

# Health Actuary Salary

Health actuaries work in the healthcare insurance industry. According to the 2018 Actuarial Salary Survey conducted by DW Simpson "The health market has seen the fastest growth in salaries along with the **highest demand for experienced actuaries.** With the implementation of the Affordable Care Act, the demand for health actuaries has dramatically increased at all experience levels, from student to Chief Actuaries. " [I]

| Health | < 1 yr | 1-3 yrs | 3-5 yrs | 5-7 yrs | 7-10 yrs | 10-15 yrs* | 15-20 yrs* | 20+yrs* |
|---|---|---|---|---|---|---|---|---|
| 1 Exam | 49-60 | 54-69 | 57-76 | | | | | |
| 2 Exams | 54-66 | 56-76 | 62-84 | 65-89 | | | | |
| 3 Exams | 56-72 | 57-83 | 63-90 | 67-96 | | | | |
| 4 Exams | 58-74 | 62-89 | 70-103 | 80-107 | 82-115 | | | |
| 5 Exams | | 68-93 | 72-110 | 82-121 | 84-126 | | | |
| ASA | | 78-120 | 80-126 | 85-134 | 94-150 | 104-204 | 133-240 | 145-268+ |
| FSA | | | 106-165 | 112-174 | 121-210 | 140-273 | 155-390 | 166-423+ |

The chart above is a screenshot from the DW Simpson Salary Survey.

I. ("2018 Actuarial Salary Survey by DW Simpson," 2018)

# Life Actuary Salary

Life actuaries work in the life insurance industry. According to the 2018 Actuarial Salary Survey conducted by DW Simpson "The life actuarial market typically has the **highest outliers** with salaries well into the six figures. These high paid actuaries usually have backgrounds in investments, consulting and international business." [I]

| Life | < 1 yr | 1-3 yrs | 3-5 yrs | 5-7 yrs | 7-10 yrs | 10-15 yrs* | 15-20 yrs* | 20+ yrs* |
|---|---|---|---|---|---|---|---|---|
| 1 Exam | 51-61 | 55-70 | 56-74 | | | | | |
| 2 Exams | 52-64 | 56-78 | 60-85 | 63-92 | | | | |
| 3 Exams | 55-69 | 58-81 | 63-94 | 69-100 | | | | |
| 4 Exams | 57-76 | 64-92 | 68-100 | 74-104 | 76-117 | | | |
| 5 Exams | | 71-103 | 72-109 | 76-120 | 87-130 | | | |
| ASA | | 75-117 | 76-125 | 84-147 | 94-172 | 106-191 | 109-225 | 128-263+ |
| FSA | | | 104-156 | 122-202 | 124-255 | 135-286 | 153-364 | 158-528+ |

The chart above is a screenshot from the DW Simpson Salary Survey.

I. ("2018 Actuarial Salary Survey by DW Simpson," 2018)

# Pension Actuary Salary

Pension actuaries work in the retirement and pension plan industry. According to the 2018 Actuarial Salary Survey conducted by DW Simpson "Pension **jobs make up less than 10%** of open actuarial jobs, however, the demand for actuaries to manage existing retirement funds remains constant with salaries rising for associates & fellows. In recent years, more companies and individuals have moved into 401Ks and other retirement options. This has led to slightly negative growth for the overall pension market, with the exception being public pensions." [I]

| Pension | < 1 yr | 1-3 yrs | 3-5 yrs | 5-7 yrs | 7-10 yrs | 10-15 yrs* | 15-20 yrs* | 20+ yrs* |
|---|---|---|---|---|---|---|---|---|
| 1 Exam | 44-56 | 50-64 | 55-70 | | | | | |
| 2 Exams | 46-62 | 56-70 | 58-77 | 64-83 | | | | |
| 3 Exams | 48-68 | 57-74 | 61-84 | 65-91 | 72-99 | | | |
| 4 Exams | 56-75 | 63-84 | 65-91 | 74-100 | 76-106 | | | |
| 5 Exams | | 66-89 | 68-94 | 75-104 | 77-112 | | | |
| ASA | | 78-95 | 80-105 | 87-118 | 90-139 | 108-175 | 124-243 | 152-260+ |
| FSA | | | | 112-151 | 118-168 | 125-235 | 154-329 | 164-364+ |

The chart above is a screenshot from the DW Simpson Salary Survey.

I. ("2018 Actuarial Salary Survey by DW Simpson," 2018)

# Salaries by Gender

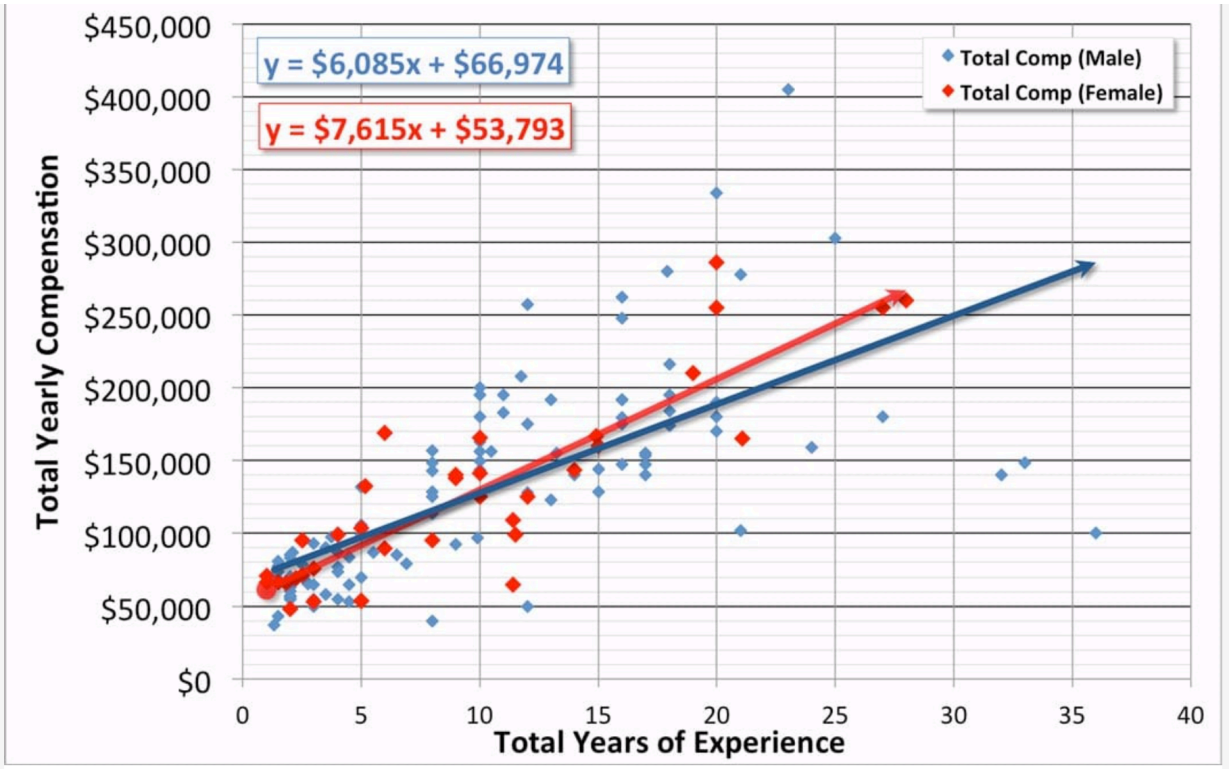
DW Simpson thought it was of interest to investigate actuarial salaries by gender. In addition, they divided their gender study by industry. [I] As you will see in the following pages, it appears that gender does not have a large effect on salaries across all of the studied industries.

In 2016, Data USA reported the gender composition of the actuarial field was 69.9% males and 30.1% females. In addition, they reported that the number of males in the industry has been increasing at a rate quicker than the number of females. [II]

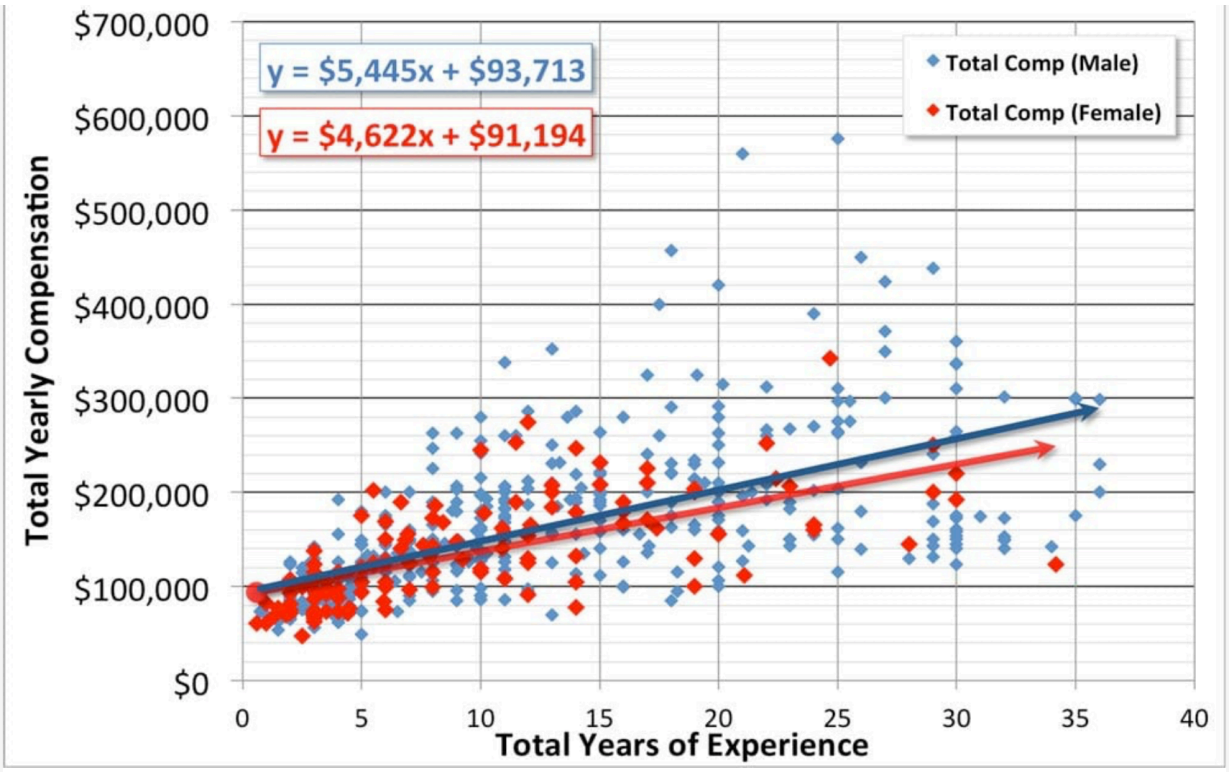
In the preceding tables, you will see scatterplots by gender for pension, life, health, and casualty actuaries. Each plot has a line of best fit as well as the slope-intercept formula for this line.

I. ("2018 Actuarial Salary Survey by DW Simpson," 2018)
II. ("Data USA: Actuaries," n.d.)

## Pension Actuaries Salaries By Gender [I]




## Life Actuaries Salaries By Gender [I]

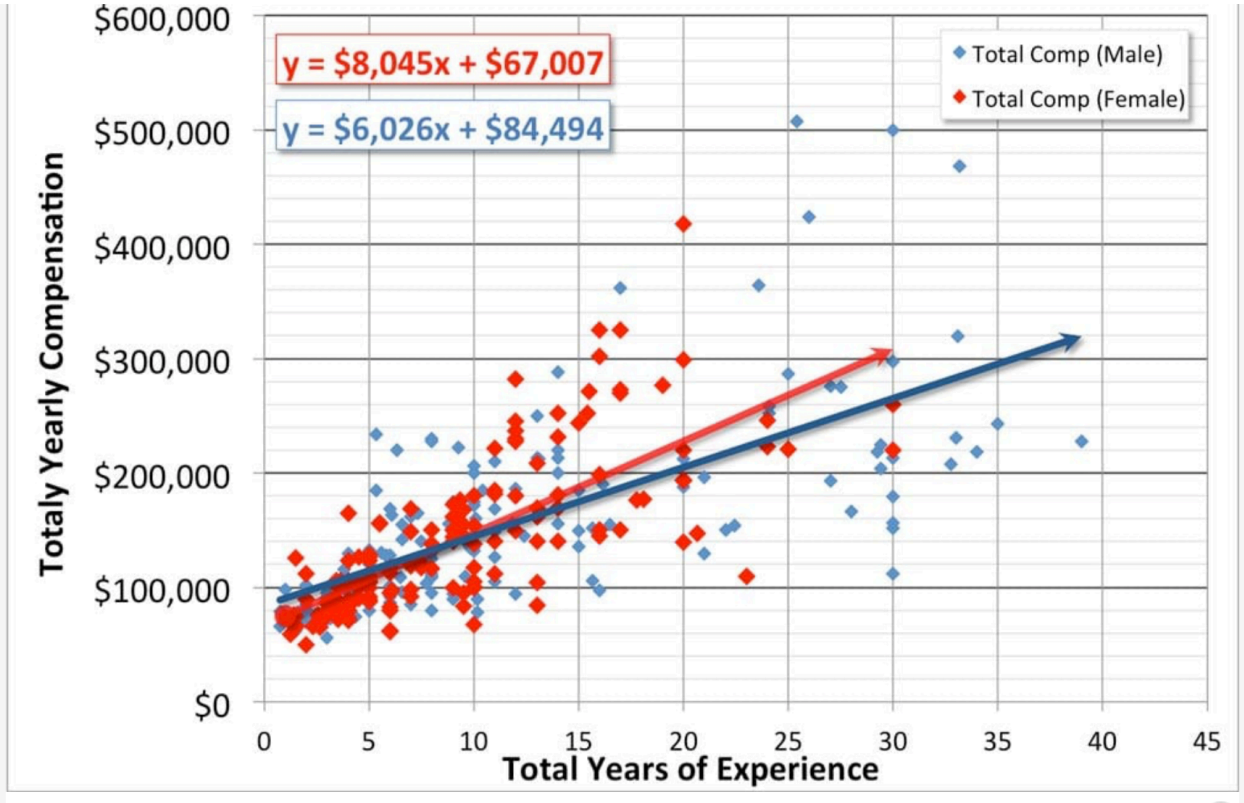



The graphs above are screenshots from the DW Simpson Salary Survey.

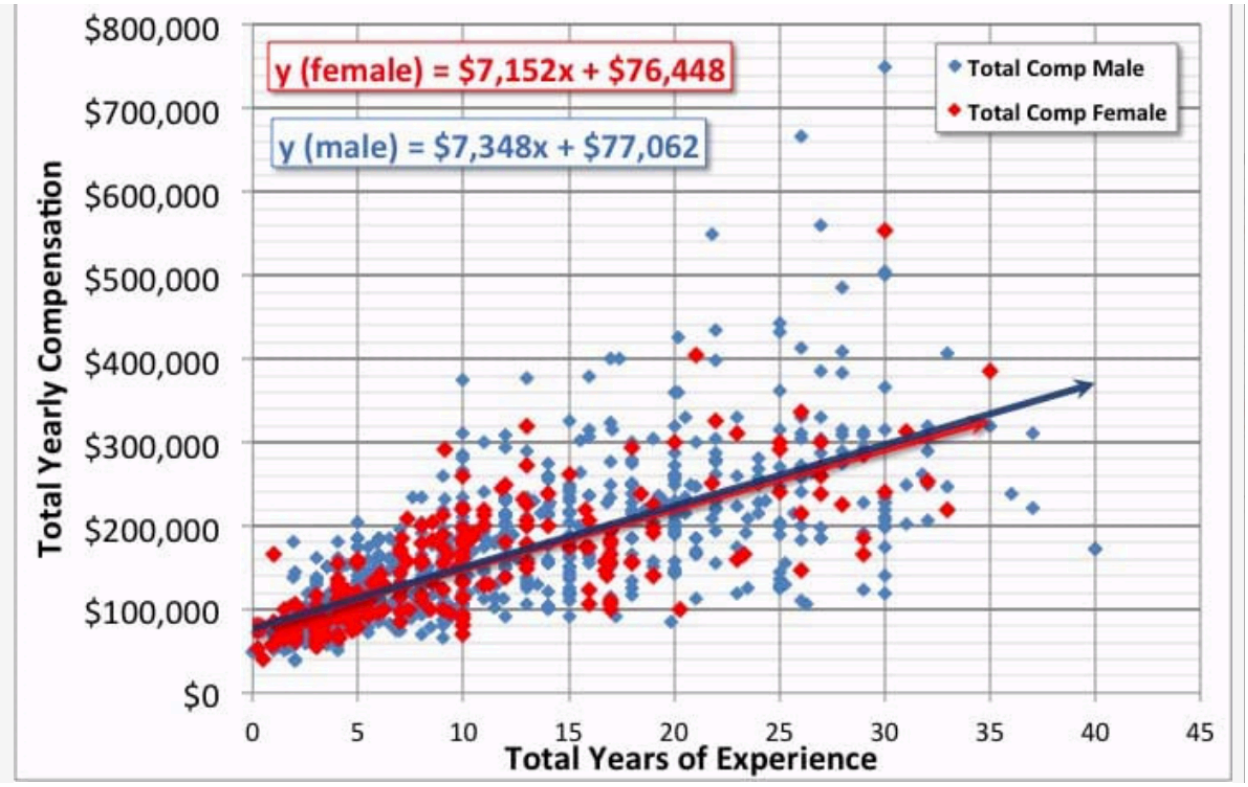


I. ("2018 Actuarial Salary Survey by DW Simpson," 2018)

## Health Actuaries Salaries By Gender [I]




## Casualty Actuaries Salaries By Gender [I]




The graphs above are screenshots from the DW Simpson Salary Survey.



I. ("2018 Actuarial Salary Survey by DW Simpson," 2018)

# Chapter 2:
# Education

What Should I be Studying in College?

Technical Skills

V.E.E. Certification

# What Should I be Studying in College?

One of the perks of a career in actuarial science is that it does not require a graduate degree. Most members of the profession do not pursue a graduate degree unless their bachelor's degree was in a field irrelevant to actuarial science.

With the increase in popularity of actuarial science, colleges and universities have been developing actuarial science majors. The University of South Carolina recommends a mathematics or statistics degree with a risk management and insurance minor and a concentration in actuarial mathematics.

To become an actuary, it is not necessary to have an actuarial science major/minor. Aspiring actuaries can major in anything from Finance, Economics, Computer Science, Statistics, or Mathematics. [I]

Technical skills are an important component of the actuarial career field; therefore, aspiring actuaries should consider enrolling in courses in computer coding. If you are majoring in statistics, you will be required to enroll in STAT 540 as part of your curriculum.

STAT 540 will teach a basic knowledge of both R and SAS; after the completion of this course, you will have the knowledge to pass the SAS Base Programmer Certification Exam. [II] This could be beneficial to an actuarial student who is looking to strengthen their resume, especially if this student does not have actuarial experience. In addition, actuarial students may be interested in taking STAT 541 to enhance their knowledge of SAS. After the completion of this course, students will have the knowledge to pass the SAS Advanced Programmer Certification Exam. For more information about these SAS Certifications, please review the following link: https://www.sas.com/en_us/certification.html.

I. ("Colleges with Actuarial Programs," n.d.)
II. ("Course Descriptions – Columbia Campus," n.d.)

# Technical Skills

Strong technical skills are extremely important in a successful actuarial career. There are several programs that actuaries use throughout their career, and it can vary which programs you will use based on your company's preference. Typical programs you may see include:

- **Microsoft Excel**: This program is used extensively by many actuarial departments. In addition, coding with excel VBA is also commonly used by actuaries.
- **Microsoft Access:** At some companies, actuaries use Access to manage and filter data with queries. Access uses SQL (Structured Query Language) which can be helpful to know when learning other programs.
- **SAS and R:** Typically actuaries will use either SAS or R when working with large data sets. According to Investopedia, "Actuaries frequently use models and tables to evaluate large data." [I]

If you are looking to increase your technical skills, *The Infinite Actuary* offers an online course at a discount to fulltime students that teaches technical skills specifically in the context of actuaries. In addition, *Skill Share* is a free resource that allows users to watch short tutorial videos to learn the basics of several programs.

I. (Johnston, 2018)

# Validation by Educational Experience Certifications

The Validation by Educational Experience (VEE) is an additional requirement to the preliminary exams. It is not required that you fulfill these requirements prior to sitting for your first exam; it is required by both the Society of Actuaries (SOA) and the Casualty Actuarial Society (CAS), however, that a candidate has passed two actuarial exams before submitting an application for their VEE credits.

The VEE credits are jointly created by the SOA and CAS, and the credits for these learning experiences can be transferred to either organization. The VEE credits necessary for both the SOA and CAS include:

- **VEE: Economics**
- **VEE: Accounting and Finance**

In addition to the two VEEs above, the SOA also requires its candidates to complete the **VEE: Mathematical Statistics** credit.

These VEE credits can be achieved either through college courses at the University of South Carolina, standardized examinations, and other educational experiences. [I]

**Apply for VEE credit and search for alternative ways to fulfill course requirements:**

- https://www.soa.org/education/exam-req/edu-vee.aspx



I. ("VEE: Validation by Educational Experience," n.d.)

# VEE: Economics

At the University of South Carolina, the Economics VEE requirement can be satisfied with the combination of ECON 221 and ECON 222. Below is an excerpt from the SOA website of the topics covered by this VEE.

"**Microeconomics**

- Explain the concept of utility and how rational utility maximizing agencies make consumption choices.
- Explain the elasticity of supply and demand and the effects on a market of the different levels of elasticity.
- Explain the interaction between supply and demand and the way in which equilibrium market prices are achieved.
- Explain various pricing strategies that can be used by firms.
- Explain the core economic concepts involved in choices made by businesses with respect
- to short-run and long-run investment and production choices.
- Explain competitive markets and how they operate.
- Explain profitability in markets with imperfect competition.

**Macroeconomics**

- Explain basic macroeconomic measures (e.g., GDP) used to compare the economies of countries.
- Describe the structure of public finances for an industrialized country.
- Explain the effect of fiscal and monetary policy on the economy, including the effect on
- financial markets.
- Explain the role of international trade, exchange rates and the balance of payments in the
- economy.
- Explain the effect of savings and consumption rates on the economy.
- Explain the major factors affecting the level of interest rates, the rate of inflation, the
- exchange rate, the level of employment and the rate of growth for an industrialized
- country.
- Describe the function of money in the economy.
- Explain the relationship between money and interest rates.
- Explain how macroeconomic policies affect businesses." [I]

I. ("Guidelines for Approval of VEE Courses and Educational Experiences," 2019)

# VEE: Corporate Finance and Accounting

Under the new guidelines issued in July 2018, the Corporate Finance and Accounting VEE can be satisfied with the combination of ACCT 221 and FINA 363 at the University of South Carolina. Below is an excerpt from the SOA website of the topics covered by this VEE.

"**Accounting**

- Describe the basic principles of personal and corporate taxation and the taxation of investments held by institutions.
- Explain why companies are required to produce annual reports and accounts.
- Explain fundamental accounting concepts and terms, and describe the main sources of
- accounting regulation.
- Explain the purpose and interactions between the income statement, balance sheet, and
- cash flow statements.
- Explain the value of reporting on environmental, social and economic sustainability and
- other alternatives to traditional financial reporting, and describe possible contents of such
- reports.
- Explain the basic structure of company and group accounts.
- Explain the purpose of the main components of company accounts and interpret them.
- Construct simple statements of financial position and profit or loss.
- Calculate and interpret financial and accounting ratios.

**Corporate Finance**

- Explain the characteristics of various forms of equity capital from the point of view of the issuer and the investor.
- Explain the characteristics of various forms of long-term debt capital from the point of view of the issuer and the investor.
- Explain the characteristics of various forms of short- and medium-term financing from the point of view of the issuer and the investor.
- Calculate weighted-average cost of capital.
- Explain the main methods of capital budgeting.
- Calculate a project's investment return." [I]

I. ("Guidelines for Approval of VEE Courses and Educational Experiences," 2019)

# VEE: Mathematical Statistics (SOA Only)

Under the new guidelines issued in July 2018, the Mathematical Statistics VEE requirement can be satisfied with the combination of STAT 512 and STAT 513 at the University of South Carolina. Below is an excerpt from the SOA website of the topics covered by this VEE.

"**Mathematical Statistics**

- Explain the concepts of random sampling, statistical inference and sampling distribution, and state and use basic sampling distributions.
- Describe the main methods of estimation and the main properties of estimators, and apply them. Methods include matching moments, percentile matching, and maximum likelihood, and properties include bias, variance, mean squared error, consistency, efficiency, and UMVUE.
- Construct confidence intervals for unknown parameters, including the mean, differences of two means, variances, and proportions.
- Test hypotheses. Concepts to be covered include Neyman-Pearson lemma, significance and power, likelihood ratio test, and information criteria. Tests should include for mean, variance, contingency tables, and goodness-of-fit." [I]

The Mathematical Statistics VEE credit is only required for the Society of Actuaries Designations. This VEE and the Accounting and Finance VEE have been revised in July 2018 from the previous VEE topics Applied Statistical Methods and Corporate Finance. Students who completed courses that fulfilled these credits will earn transitional credits and will not be required to complete the new VEE requirements. All students are required to fulfill the Economics VEE credit. [II]

I. ("Guidelines for Approval of VEE Courses and Educational Experiences," 2019)
II. ("VEE: Validation by Educational Experience," n.d.)

# Chapter 3:
# Exam Process

Preliminary Exams
Preparing for Exams
Society of Actuaries Designation
Casualty Actuarial Society Designation

# Preliminary Exams

Early on in your actuarial career, you will need to decide which pathway is right for you: **Casualty Actuarial Society** (CAS) or **Society of Actuaries** (SOA).

This decision is not usually made until the student receives their first fulltime employment offer. Because the first three examinations are the same for both designations, students may start the exam process regardless of whether they know which path is right for them.

Later in this chapter, we will discuss further the details that distinguish a CAS designation from an SOA designation, but in the most basic sense, CAS actuaries typically work in the Casualty and Property insurance industry while SOA actuaries typically work in pensions, healthcare insurance, and life insurance industries.


# Exam P/1

This exam can fulfill either the Probability credit for the Society of Actuaries designation, or the Exam 1 credit for the Casualty Actuarial Society designation. This exam is a three-hour exam and consists of 30 multiple choice questions. This exam focuses on the fundamental probability tools for quantitatively assessing risk; this exam assumes a basic knowledge of calculus, insurance, and risk management.

Exam P/1 is typically offered six times a year (every other month). Exam schedules for this exam, as well as all other exams, can be found on both the SOA and CAS websites. [I]

According to the University of South Carolina course bulletin for the statistics department, most of the topics on Exam P/1 are covered with completion of STAT 511/MATH 511 – Probability [II] and STAT 512 – Mathematical Statistics [III]. Students should consider sitting for Exam P/1 after completion of STAT 511 and midway through STAT 512 or after completion of both courses.

The following is a studying tip from the SOA: "There is no substitute for starting early. No matter how well you have done in your math classes, it is best to start at least eight weeks prior to the P/1 exam. Keep in mind that everyone taking this exam has excelled in mathematics. The exams are very rigorous and are designed to test knowledge of the material at a very high level. That is why the pass rate on this exam typically ranges only in the 30 to 40 percent range." [IV]

**In September 2018, the SOA reported:**

- **On average, candidates needed to answer 71% of the questions correctly to pass**
- **The percentage of candidates that passed Exam P/1 was 42%** [I]

I. ("Exam P: Probability," n.d.)
II. ("STAT 511," n.d.)
III. ("STAT 512," n.d.)
IV. ("How to Best Prepare for Actuarial Exams," 2007)

# Exam FM/2

This exam can fulfill either the Financial Mathematics credit for the Society of Actuaries designation, or the Exam 2 credit for the Casualty Actuarial Society designation. This exam is a three-hour exam and consists of 35 multiple choice questions. The exam focuses on the fundamental concepts and applications of financial mathematics; this exam assumes a basic knowledge calculus and probability.

Exam FM/2 is typically offered six times a year (every other month). Exam schedules for this exam, as well as all other exams, can be found on both the SOA and CAS websites. [I]

According to the University of South Carolina course bulletin for the finance department, several of the topics on Exam FM/2 are covered with the completion of FINA 363 – Introduction to Finance and FINA 469 – Investment Analysis and Portfolio Management. [II] Students should consider using an alternative study method to supplement the material learned in these course either concurrently while enrolled in these courses or after the completion of these courses.

According to the SOA, "you will save yourself a tremendous amount of time and energy, and significantly increase your odds of passing your first exam(s) by purchasing supplemental actuarial study materials for each exam." [III] Choosing an appropriate learning material for you is vital. See the "Preparing for Exams" section for more information on learning materials.

**In August 2018, the SOA reported:**

- **On average, candidates needed to answer 70% of the questions correctly to pass**
- **The percentage of candidates that passed Exam FM/2 was 49.5%**

I. ("Exam FM: Financial Mathematics," n.d.)
II. ("Course Descriptions – Columbia Campus," n.d.)
III. ("How to Best Prepare for Actuarial Exams," 2007)

# Exam IFM/3F

Previously known as Exam MFE/3, this exam can fulfill either the Investment and Financial Markets credit for the Society of Actuaries designation, or the Exam 3F credit for the Casualty Actuarial Society designation. This exam is a three-hour exam and consists of 30 multiple choice questions. The exam focuses on the theoretical basis and application of corporate finance and financial models in insurance and other financial risk markets; this exam assumes a thorough knowledge of calculus and probability (concepts covered on Exam P/1) and assumes a basic knowledge of corporate finance and interest theory.

Exam IFM/3F is typically offered three times a year (every four months). Exam schedules for this exam, as well as all other exams, can be found on both the SOA and CAS websites. [I]

According to the University of South Carolina course bulletin for the finance department, several of the topics on Exam IFM/3F are covered with the completion of FINA 471 – Derivative Securities and FINA 475 – Fixed Income Securities. [II]

The SOA recommends students wait until they receive confirmation of passing an exam to begin studying for the next exam. They stated, "there is no sense getting two 5s when you can get one 6!" [III] It is also important to note that while there is no order exams must be taken in, materials on Exam P/1 and Exam FM/2 are assumed knowledge for all other preliminary exams. [IV]

**In August 2018, the SOA reported:**

- **On average, candidates needed to answer 68% of the questions correctly to pass**
- **The percentage of candidates that passed Exam IFM/3F was 49.7%**

I. ("Exam IFM: Investment and Financial Markets," n.d.)
II. ("Course Descriptions – Columbia Campus," n.d.)
III. ("How to Best Prepare for Actuarial Exams," 2007)
IV. ("Actuarial Exams | Exam FAQs," n.d.)

# Preparing for Exams

Students have a variety of preferred study methods for learning the actuarial exam material.

- **Visual/Listening Learners:** For students who prefer to learn in a lecture like fashion, websites like The Infinite Actuary or The Coaching Actuary develop a series of recorded lectures that allows students to watch and re-watch to gain proper understanding of each concept.
- **Self-Study Learners:** For students who prefer to learn by reading textbooks and guides, there are several companies that publish exam manuals that allow students to learn at their own pace.
- **Study Reinforcement:** After learning the exam material, there are several ways to reinforce the concepts, such as flashcards or practice problem programs.

There are many online bookstores for actuaries to browse for desired materials, including: www.actuarialbookstore.com and www.studymanuals.com which offer discounts to fulltime students.

# Prometric Testing Centers

If you are planning on sitting for an exam while at University of South Carolina, there is a test center conveniently located in Columbia, SC, approximately 15 minutes from campus. Below are some tips to prepare you for the exam center on exam day:

- **Remove all jewelry and personal items:** Prometric does not allow students to bring any personal items into the testing room. This includes hats, watches, outerwear, and jewelry (excluding wedding rings). Glasses must be inspected before entering into the exam room. Candidates will also be scanned with a metal detector wand.
- **Wear simple clothing:** Students will be required to turn all pockets inside-out to ensure they are empty, and will be asked to raise pant legs above ankles and pull up long-sleeve shirts above wrists.
- **Remember approved calculator(s):** Check the SOA and CAS websites for a list of approved calculators for each exam. Some exams allow you to use more than one calculator. If you arrive on exam day without the correct calculator, you will have to take the exam without any device!

# Society of Actuaries Designation

The first credential of the SOA is when a candidate earns their Associate of the Society of Actuaries (ASA). This designation is earned from passing Exams P, FM, IFM, STAM, LTAM, SRM, PA, completion of the Fundamentals of Actuarial Practice course, all 3 VEEs, and the Associate Professionalism seminar. After a candidate earns his or her ASA, the next designation for a SOA candidate is to earn their Fellowship of the Society of Actuaries (FSA).

The Fellowship designation allows for actuaries to pick from a list of pathways (Corporate Finance and ERM, Quantitative Finance and Investment, Individual Life Insurance and Annuities, Retirement Benefits, Group and Health Insurance, and General Insurance) and requires successful completion of several more exams and learning courses.

The SOA offers an additional certification that is growing in popularity: the Chartered Enterprise Risk Analyst (CERA) which includes several requirements that overlap with the ASA designation requirements. [I]

To learn more about the SOA designation, visit the website below:
https://www.soa.org/future-actuaries/earning-credentials/

I. ("Earning Actuarial Credentials," n.d.)

# Casualty Actuarial Society Designation

The first credential of the CAS is when a candidate earns their Associate of the Casualty Actuarial Society (ACAS). This designation is earned from passing Exam 1, Exam 2, Exam 3F, MAS-I, MAS-II, Exam 5, Exam 6, completion of risk management and insurance courses, VEE: Economics, VEE: Accounting and Corporate Finance, and the Professionalism seminar. After a candidate earns their ACAS, the next designation for a CAS candidate is to earn their Fellowship of the Casualty Actuarial Society (FCAS).

The Fellowship designation requires successful completion of three more exams.

As mentioned before, Exam 1, Exam 2, Exam 3F, VEE: Economics, and VEE: Accounting and Corporate Finance all overlap with SOA requirements, so students can begin the designation process before deciding which designations they wish to pursue. [I]

To learn more about the CAS designation, visit the website below:
https://www.casact.org/admissions/process/

I. ("The CAS Path to Success," n.d.)

# Chapter 4:
## Starting your Career

How Do I Find an Internship?
Actuarial Development Programs
How do I Make a Competitive Resume?
Interview Preparation

# How do I Find an Internship?

Landing your first internship can be hard, so it is extremely important you take the correct steps in preparing. Check out the sections "How do I Make a Competitive Resume?" and "Interview Preparation" for tips on landing an internship once you have received an interview! Below are some tips that will make your internship hunt easier:

- **Use Resources Provided by the University:** USC provides many resources to help students land jobs and internships, including: Handshake, fall and spring career fairs, and virtual career fairs. All these resources are free and available exclusively to USC students.
- **Apply Everywhere:** Search the internet for actuarial internships and apply to ALL of them. Chances are you will not hear back nor receive an interview from all the companies you apply to, so it is best to have a lot of options. When searching for actuarial internships, LinkedIn, Glassdoor, and Indeed are good resources for finding positions.
- **Start Early:** Many actuarial recruiters begin their search for summer interns in the beginning of the fall semester! If you are serious about getting an internship, start filling out application in August and September.

# What to Expect for an Internship

Every internship will differ depending on the company, industry, and actuarial team that you are placed on. I interned with Colonial Life, in Columbia, where I was placed on the company's pricing team. I helped update claim cost assumptions based on company experience for the reprice of a group critical illness product and developed a commission analysis tool for underwriting business partners to utilize in competitive cases to ensure the company meets profitability goals. I also researched and categorized the International Classification of Disease (ICD) codes for the transition from ICD 9 to ICD 10 classification used in the annual mortality studies. In addition, I worked on several smaller projects throughout the summer.

Actuarial interns can be responsible for anything from meeting with clients to completing quarterly reserve reports. Internships are a great opportunity to trial the actuarial career field and gain hands-on experience with actuarial tasks.

When I began interning at Colonial Life, I had no prior knowledge of the responsibilities of a pricing actuary; however, my manager and team worked closely with me to teach me a variety of tasks. Remember an internship is a learning opportunity, so take the time to ask questions and get the most out of the internship.

# Actuarial Development Programs

Many insurance companies have created programs within their departments to develop actuaries' skills. These programs come with many benefits to the "students" that participate in them. Typically, these programs are 6 or more years long, and students rotate through 3 or more departments during this duration. The program usually last until the student has completed his/her final designation.

A major benefit of an Actuarial Development Program compared to a regular entry level position is that actuarial students in the program get to learn many sides to the business instead of just one. Rotations usually include the larger departments, such as pricing and reserving, as well as smaller company specific departments, such as planning or business analysis. These rotations help create more well rounded actuaries.

Another major benefit of an Actuarial Development Program is exam support. As you move through the designations, exams get more and more expensive, as well as studying materials to prepare for the exam. Many companies will cover the costs of these exams and study materials as part of their program. In addition, because the company is paying for its students to sit for exams, they want their students to be successful, so often companies will grant paid study time leading up to an exam.

# How do I Make a Competitive Resume?

Resumes are extremely important in landing your first internship or job. Most employers receive hundreds, if not thousands, of resumes for each position posted on their website; therefore, recruiters only skim your resume at best.

It is important that your resume is easy to read, and displays the important information at the top, followed by the less important information towards the bottom.

As an actuarial student, it is important that you have an actuarial section dedicated to showing the employer the exams you have passed, the exams you plan to sit for, and any VEEs you plan to satisfy upon graduation. [I]

Take advantage of professional resume templets found on the internet, or on USC and Darla Moore's websites. When searching for a resume template, remember that it is important to develop a resume that will help you stand out, but keep it professional and appropriate to your career field.

I. (Cunningham and Paxton, 2016)

# Entry Level Actuarial Resume Checklist

The largest actuarial recruiter, DW Simpson, developed a guide for what they believe is important for actuaries' to include on their resume. In addition, they also allow you to contact a recruiter if you have specific questions when developing your actuarial resume. Below is a list of items, in order, DW Simpson recommends including:

- Contact Information
- Actuarial Exams/Designations
- Professional Experience
- Education
- Technical Skills
- Ancillary Information [I]

**Did you know?**

- According to a study by *The Ladder*, **"recruiters spend only 6 seconds reviewing an individuals resume."** [II]

I. (Cunningham and Paxton, 2016)
II. (Evans, 2012)

# Interview Preparation

Interviews for actuarial positions will vary, but it is important to be prepared for all types of questions you may be asked. A tip I learned from my interview experience is that it is important to be able to talk about EVERY experience on your resume. I always go through my resume and write notes under each bullet point: How did I do this? What did I learn from this? Why was this important? Answering these questions will help you genuinely talk to the experience.

Several actuarial interviews that I have encountered asked behavioral questions. These questions typically require you to discuss a situation. You can search for example behavioral questions online. I typically prepare for these questions by writing out a list of big projects I worked on, group assignments I was a part of, situations that did not go as planned, etc. This list allows me to quickly pull a situation that matches the question asked.

Finally, because actuarial science is a very analytical career, some actuarial interviews will ask problem solving questions. In this case, I find that often the interviewer is trying to understand how you work through problems. For these types of questions, it is important that you think out loud and take the interviewer step by step through your method for solving the problem. Examples of these questions that I have faced include:

- You own a candy store that only sells peanut butter cups, how do you price your peanut butter cups? (Cigna)
- When you are playing the game of monopoly, which set of real estate properties do you acquire first and why? (Aetna)
- You own a race track and 25 race horses. You can only race 5 horses at a time and are interested in finding the 3 fastest horses, but you do not have a stop watch (you can only measure them by observing the order the horses finish). What is the smallest number of races you can do to find the fastest 3 horses? (Independence Blue Cross)

# Chapter 5:
# Resources

USC Campus Resources
External Resources

# USC Campus Resources

## Gamma Iota Sigma: International Risk Management, Insurance and Actuarial Science Collegiate Fraternity:

- Educational fraternity that teaches members about the insurance industry and opportunities within the field of study
- Meetings geared towards educating members about the actuarial profession
- Networking events that allow students to connect with professionals and gain inside access to employment opportunities

## Pi Mu Epsilon & Gamecock Math Club:

- A community of students and staff interested in mathematics that promotes fun and engaging activities that enhance students' mathematical skills and scholarly development
- Visit the website to learn more: http://people.math.sc.edu/pme/

## University of South Carolina's Career Center:

- Offers services exclusively to students such as career planning, resume reviews, interview prep, and career fairs
- Visit the website to learn more: www.sc.edu/careercenter

# External Resources

TheInfiniteActuary

www.theinfiniteactuary.com

www.casact.org

THE Actuary

www.theactuarymagazine.org

SKILLSHARE

https://www.skillshare.com


www.soa.org

@coachingactuaries

www.coachingactuaries.com

BE AN ACTUARY.

www.beanactuary.org

# Citations


"15-2011 Actuaries." *U.S. Bureau of Labor Statistics*, U.S. Bureau of Labor Statistics, 30 Mar. 2018, www.bls.gov/oes/2017/may/oes152011.htm.

"2018 Actuarial Salary Survey by DW Simpson." *DW Simpson*, 2018, www.dwsimpson.com/salary.

"Actuarial Exams | Exam FAQs." *Be an Actuary*, www.beanactuary.org/exams/?fa=exam-faqs.

"Colleges with Actuarial Programs." *Be an Actuary* , www.beanactuary.org/study/?fa=colleges-with-actuarial-programs.

"Course Descriptions – Columbia Campus." *Acalog ACMS™* , University of South Carolina, bulletin.sc.edu/content.php?catoid=70&navoid=2009.

Cunningham, Caitlin, and Emily Paxton. "Actuarial Resume Checklist - A How To Guide for Entry Level Actuaries." *DW Simpson*, 18 Feb. 2016, www.dwsimpson.com/22929/actuarial-resume-checklist.

"Data USA: Actuaries." *Data USA*, datausa.io/profile/soc/152011/.

"Earning Actuarial Credentials." *Society of Actuaries*, www.soa.org/future-actuaries/earning-credentials/.

Evans, Will. "You Have 6 Seconds to Make an Impression: How Recruiters See Your Resume." *Ladders*, 11 Mar. 2012, www.theladders.com/career-advice/you-only-get-6-seconds-of-fame-make-it-count.

"Exam FM: Financial Mathematics." *Society of Actuaries*, www.soa.org/education/exam-req/edu-exam-fm-detail.aspx.

"Exam IFM: Investment and Financial Markets." *Society of Actuaries*, www.soa.org/Education/Exam-Req/edu-exam-ifm-detail.aspx.

"Exam P: Probability." *Society of Actuaries*, www.soa.org/education/exam-r eq/edu-exam-p-detail.aspx.

"Guidelines for Approval of VEE Courses and Educational Experiences." *Society of Actuaries*, 19 Jul. 2019. PDF file.

"How to Best Prepare for Actuarial Exams." *Society of Actuaries*, 2007, www.soa.org/library/newsletters/the-future-actuary/2007/summer/how-to-prepare.aspx.

# Citations


"Is This the Career For You? | How Do I Get Started?" *Be an Actuary* , The Society of Actuaries and Casualty Actuarial Society, www.beanactuary.org/how/is/?fa=is-this-the-career-for-you.

Johnston, Matthew. "The Top 5 Skills Every Actuary Needs." *Investopedia*, Investopedia, 25 July 2018, www.investopedia.com/articles/investing/052015/top-5-skills-every-actuary-needs.asp.

"Should I Be an Actuary? (The Why YES and the Why NO)." *Etched Actuarial*, 15 Mar. 2018, etchedactuarial.com/should-i-be-an-actuary/.

"STAT 511." *Department of Statistics*, University of South Carolina, sc.edu/study/colleges_schools/artsandsciences/statistics/my_stat/courses/descriptions/undergrad_courses/stat511.php.

"STAT 512." *Department of Statistics* , University of South Carolina , sc.edu/study/colleges_schools/artsandsciences/statistics/my_stat/courses/descriptions/undergrad_courses/stat512.php.

"The CAS Path to Success." *Casact.org*, Casualty Actuarial Society , www.casact.org/admissions/process/.

"VEE: Validation by Educational Experience." *Society of Actuaries*, Society of Actuaries, www.soa.org/education/exam-req/edu-vee.aspx.

"What Do We Do | A Top Ranked Job." *Be an Actuary*, The Society of Actuaries and Casualty Actuarial Society, www.beanactuary.org/what/do/?fa=what-do-we-do.

"What Is a Property and Casualty Actuary?" *CAS Student Central*, www.casstudentcentral.org/about-our-profession/what-is-a-property-and-casualty-actuary/.

"What Is an Actuary | A Top Ranked Job." *Be an Actuary*, The Society of Actuaries and Casualty Actuarial Society, www.beanactuary.org/what/top/?fa=a-top-ranked-job.

"Where Do We Work?" *Be an Actuary*, www.beanactuary.org/what/work/?fa=where-do-we-work.