Actuarial Fields / Career Paths Workshop
Agenda

- Overview
- Insurance
- Consulting
- Insurance vs Consulting
- Nontraditional Actuarial Roles
Overview
Overview

What is an actuary?

- An actuary is a business professional who uses mathematical and statistical techniques to put price tags on risks.
- Actuaries calculate the costs of uncertain future events that range from various natural disasters, such as tornados and hurricanes, to changes in life expectancy.
Where do Actuaries Work?

Membership by Primary Practice Area

- Banking: 300 (6.6%)
- Data Analytics: 151 (3.35%)
- Education: 98 (2.18%)
- Environment & Energy: 11 (0.24%)
- Finance: 60 (1.33%)
- General Insurance: 1075 (23.87%)
- Health Insurance: 95 (2.11%)
- Information Technology: 38 (0.84%)
- Investment & Fund Management: 246 (5.46%)
- Life Insurance: 1030 (22.87%)
- Management: 43 (0.95%)
- Non-Actuarial: 60 (1.33%)
- Other: 531 (11.79%)
- Reinsurance: 129 (2.86%)
- Risk Management: 131 (2.91%)
- Students: 18 (0.40%)
- Superannuation: 327 (7.26%)
- Wealth Management: 59 (1.31%)
- No Information: 102 (2.26%)
Where do Actuaries Work

Actuaries work in insurance companies, consulting firms, accounting firms, governments, tech companies, and more.

**Major Lines of Business:**
- Health and Benefits
- Property and Casualty
- Retirement
- Life
- Reinsurance

**Other Roles:**
- Data Mining
- Catastrophe Modeling
- Investment Management
- Software
- Quantitative Analytics
Why Become an Actuary?

- Low stress
- High compensation
- Low unemployment rate
- High job security
  - No computer can replicate our work
  - Risk management is more important during economic recessions
- Balanced lifestyle
- Instead of paying for graduate school, advance your career through a series of employer-funded exams
- Impactful work
  - We can see how our solutions impact the real world
- Salary increases with passed exams and experience
Why Become an Actuary?

Best Jobs For Math Majors in 2019

Math majors have countless career options. Here is a list of some of the highest paying jobs among math majors.

<table>
<thead>
<tr>
<th>Rank</th>
<th>Job Title</th>
<th>Most Common Major</th>
<th>% Workers with Major</th>
<th>Mid-Career Pay</th>
<th>% High Job Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Actuary</td>
<td>Mathematics</td>
<td>54%</td>
<td>$131,000</td>
<td>41%</td>
</tr>
<tr>
<td>2</td>
<td>Data Engineer</td>
<td>Mathematics</td>
<td>34%</td>
<td>$113,000</td>
<td>41%</td>
</tr>
<tr>
<td>2</td>
<td>Quantitative Analyst</td>
<td>Statistics</td>
<td>26%</td>
<td>$113,000</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>Data Scientist</td>
<td>Mathematics</td>
<td>29%</td>
<td>$111,000</td>
<td>36%</td>
</tr>
<tr>
<td>4</td>
<td>Business Intelligence Manager</td>
<td>Mathematics</td>
<td>50%</td>
<td>$110,000</td>
<td>41%</td>
</tr>
<tr>
<td>5</td>
<td>Analytics Consultant</td>
<td>Mathematics</td>
<td>29%</td>
<td>$98,600</td>
<td>40%</td>
</tr>
</tbody>
</table>
Why Become an Actuary?
Actuarial Organizations

- There are two main actuarial organizations that govern different practices
  - Within each practice, actuaries can be divided into Insurance or Consulting

Health
Life
Retirement

Property and Casualty
Insurance
P&C actuaries help protect individuals and businesses against losses from automobile accidents, property damage, theft, and commercial liability. New technologies and developments in predictive analytics and modeling allow P&C actuaries to quantify and manage emerging risks such as self-driving cars, climate change, and ridesharing.
Property and Casualty

- Home Insurance
- Personal & Commercial Auto
- Disaster Insurance
- Workers’ Compensation
- Medical Malpractice
# Questions P&C Actuaries Might Answer

<table>
<thead>
<tr>
<th>Pricing</th>
<th>Reserving</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ex: How much more does AAA have to charge drivers who have a DUI conviction? How much of a discount can we give drivers whose cars have more airbags?</td>
<td>Ex: How much cash does Farmers have to keep on-hand to pay claims? How much can it use to invest for profit?</td>
</tr>
</tbody>
</table>
P&C Companies
Health actuaries help draft rates/premiums to cover cost of care for individuals and work with hospitals, medical device manufacturers, doctors, and pharmacists to make the whole health system work more efficiently.
Health

Health Insurance

- Medical
- Vision
- Dental
# Questions Health Actuaries Might Answer

<table>
<thead>
<tr>
<th>Pricing &amp; Reserving</th>
<th>Healthcare Policy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ex: How much more do we need to charge smokers to cover their higher risk? By how much can we lower premiums if we invest the premiums we collect?</td>
<td>Ex: What happened to premiums when the Affordable Care Act required all people to buy health insurance? What happens now that the individual mandate has been repealed?</td>
</tr>
</tbody>
</table>
Health Companies
Life actuaries use knowledge of capital markets, mortality, and financial concepts when developing life insurance and annuity policies for individuals and groups to ensure that families are financially secure in the event of the policyholder’s death. Modern life insurance actuaries are also involved in the investment of company assets to ensure solvency and strong long-term results.
Retirement Insurance

Retirement actuaries work on companies’ PENSION PLANS and 401(k) BENEFITS.
- Age
- Time until retirement
- Mortality risk
- Interest rate
- Defined benefit versus defined contribution

Retirement actuaries are valuable resources in helping companies design competitive retirement packages to effectively attract, retain, and replace employees.
Questions that Life and Retirement Actuaries Might Answer

<table>
<thead>
<tr>
<th>Life</th>
<th>Retirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ex: How can life insurance products be adjusted to ensure attractive returns for policyholders in a low interest rate environment?</td>
<td>Ex: Can a company’s pension program remain solvent when interest rates are low for a long period?</td>
</tr>
</tbody>
</table>
Life Insurance Companies

PACIFIC LIFE

TRANSAMERICA

MassMutual

Prudential

MetLife
Retirement Companies

- CalPERS
- Ascensus
- Prudential
- AIG
Consulting
Actuarial Consulting

- Actuarial consultants advise clients on financial and insurance-related decisions for their companies
  - Must be great communicators
  - More common in Retirement and Health
Actuarial Consulting Across Different Lines of Business

<table>
<thead>
<tr>
<th>Line of Business</th>
<th>Typical Tasks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Life</td>
<td>Clarify and analyze mortality rates</td>
</tr>
<tr>
<td>Health</td>
<td>Advise clients on the best healthcare plans for their company</td>
</tr>
<tr>
<td>Retirement</td>
<td>Help craft and price the best pension plan for their clients</td>
</tr>
<tr>
<td>P&amp;C</td>
<td>Create insurance products and provide strategic advice</td>
</tr>
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</table>
## Insurance vs Consulting

<table>
<thead>
<tr>
<th>Insurance</th>
<th>Consulting</th>
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</thead>
<tbody>
<tr>
<td>More standard hours</td>
<td>Variable hours</td>
</tr>
<tr>
<td>Less travel</td>
<td>More travel</td>
</tr>
<tr>
<td>Less direct contact with clients</td>
<td>Work directly with clients often</td>
</tr>
<tr>
<td>Interact with various departments so you get a good idea of how the company works</td>
<td>Interact with various firms and clients so you get a better view of the industry as a whole</td>
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Nontraditional Actuarial Roles
There are various risks and ways to maximize efficiency in every industry. While actuaries are most found in insurance companies, there are also actuaries in:

- Accounting/Auditing
- Government
- Banking/Finance
- Sports
- Meteorology
- Private corporations
- Teaching
- And many more!
There’s insurance for practically everything. For example, Lloyd’s of London has insured:

- Bruce Springsteen’s voice
- David Beckham’s legs
- Egon Ronay’s taste buds
- Alien abduction insurance for ~30,000 policyholders
Questions?