

**Brooklyn  
College**

# Department of Mathematics

Proposed Master of Science in Actuarial Mathematics



Welcome!

Our purpose tonight is to introduce you to a proposed new Master of Science program in the Department of Mathematics: Actuarial Mathematics

Not only will this be a new program, it will be a very different type of program...



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Who are we?



# Department of Mathematics

Proposed Master of Science in Actuarial Mathematics



Olympia Hadjiliadis

Associate Professor, Mathematics

Zhenyu Cui

Assistant Professor, Mathematics



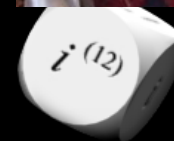
Dr. Lucas G. Rubin

Assistant Dean for Academic Programs



Diogo Pinheiro

Assistant Professor, Mathematics



### What is an Actuary?



An actuary analyzes the financial costs of risk and uncertainty. Actuaries use various mathematical approaches to assess the likelihood that an event will occur and help businesses and clients develop policies that minimize the cost of that risk.

Actuarial science incorporates a number of interrelated subjects, including probability, mathematics, statistics, financial theory, economics, and computer programming.



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Actuaries work across multiple sectors: business, finance, insurance, sports, entertainment, real estate, as well as in government, public, and nonprofit settings.



|      |      |        |      |        |
|------|------|--------|------|--------|
| 1.39 | 1.40 | 0.9192 | 1.90 | 0.9713 |
| 1.39 | 1.41 | 0.9207 | 1.91 | 0.9719 |
| 1.42 | 1.42 | 0.9222 | 1.92 | 0.9726 |
| 1.43 | 1.43 | 0.9236 | 1.93 | 0.9732 |



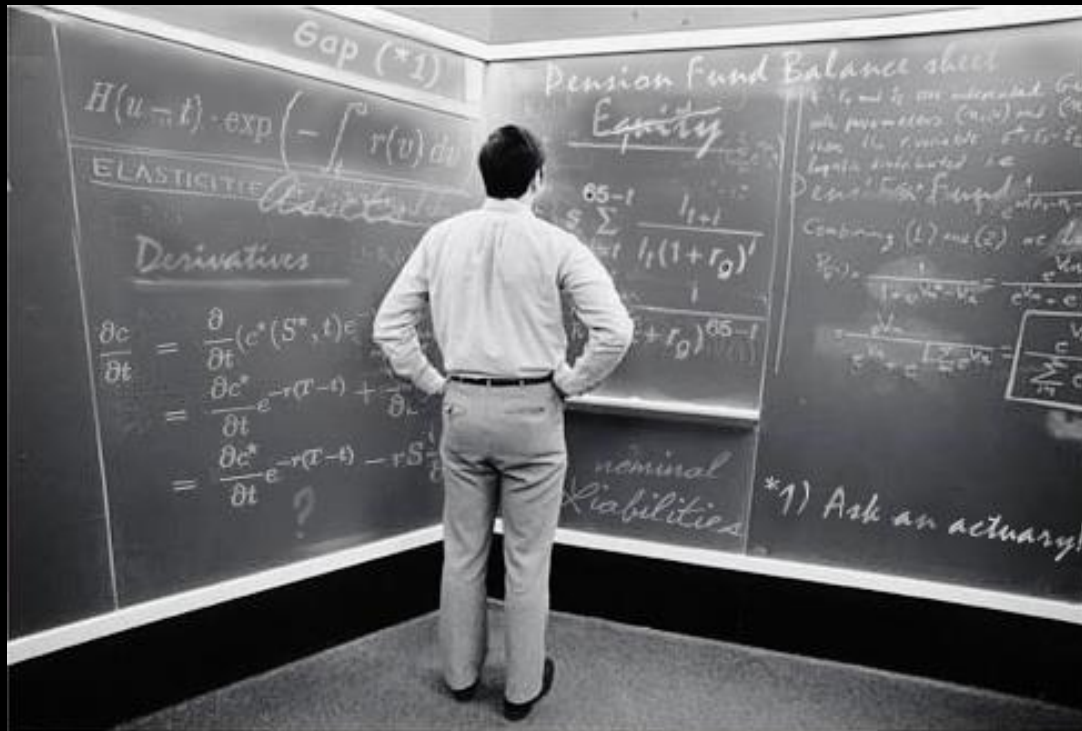
Professional traits of an actuary:

1. Likes to work with numbers
2. Enjoys complex problem solving...using data
3. (often) a facility with (and/or interest) in programming





Why become an actuary?



**BUREAU OF LABOR STATISTICS**

Home | Subjects | Data Tools | Publications | Economic Releases | Studies

OOH HOME | OCCUPATION FINDER | OOH FAQ | OOH GLOSSARY | A-Z INDEX | OOH SITE MAP

## OCCUPATIONAL OUTLOOK HANDBOOK

Math >  
**Actuaries**

Summary | What They Do | Work Environment | How to Become One | Pay | Job Outlook

### Summary

| Quick Facts: Actuaries                    |                                       |
|---|---------------------------------------|
| 2012 Median Pay ?                         | \$93,680 per year<br>\$45.04 per hour |
| Entry-Level Education ?                   | Bachelor's degree                     |
| Work Experience in a Related Occupation ? | None                                  |
| On-the-job training ?                     | Long-term on-the-job training         |
| Number of Jobs, 2012 ?                    | 24,300                                |
| Job Outlook, 2012-22 ?                    | 26% (Much faster than average)        |
| Employment Change, 2012-22 ?              | 6,300                                 |

Bureau of Labor Statistics:  
26% growth in profession  
through 2022, a pace  
“much faster than average”  
<http://www.bls.gov/ooh/math/actuaries.htm>



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## Proposed Master of Science in Actuarial Mathematics

**Forbes** - New Posts (+27 posts this hour) Most Popular (America's Youngest Billionaires) Lists (The Forbes 400)

21 Rock-Solid Dividend Payers

**The Best Jobs For 2014**

**4. Actuary**  
 Median salary (as of 2012): \$93,680  
 Projected job growth (between 2012 and 2022): 26%

Franchises under \$10,000

### Best Jobs of 2014 / Midlevel Income

1. Mathematician / \$101,360
2. Tenured University Professor / \$68,970
3. Statistician / \$75,560
4. Actuary / \$93,680
5. Audiologist / \$69,720
6. Dental Hygienist / \$70,210
7. Software Engineer / \$93,350
8. Computer Systems Analyst / \$79,680
9. Occupational Therapist / \$75,400
10. Speech Pathologist / \$69,870

### Worst Jobs of 2014 / Midlevel Income

200. Lumberjack / \$24,340
199. Newspaper Reporter / \$37,090
198. Enlisted Military Personnel / \$28,840
197. Taxi Driver / \$22,820
196. Broadcaster / \$55,380
195. Head Cook / \$42,480
194. Flight Attendant / \$37,240
193. Garbage Collector / \$22,970
192. Firefighter / \$45,250
191. Corrections Officer / \$38,970



Why a program in actuarial science?

...and, why specifically a *graduate* program?

There is, after all, an important point about becoming an actuary:

Completing an actuarial science degree cannot make you an actuary, only passing the professional exams does.



As a graduate degree, the program will:

1. Accommodate students with broad quantitative backgrounds
2. Provide enrolled students with focused academic training as well as targeted, industry-appropriate engagement and experiences (through professional development seminars, internships, applied research opportunities, etc.).
3. Provide specific preparation for industry examinations



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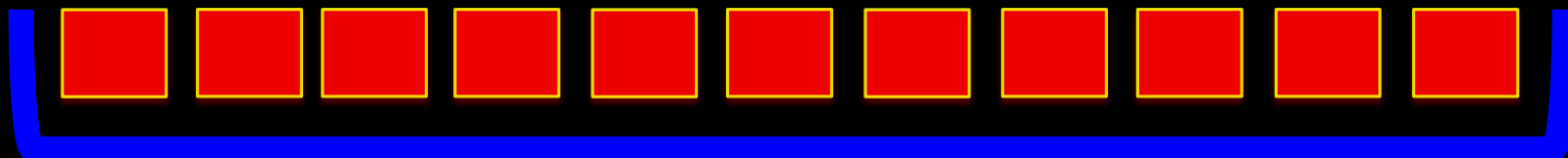
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A different type of program...



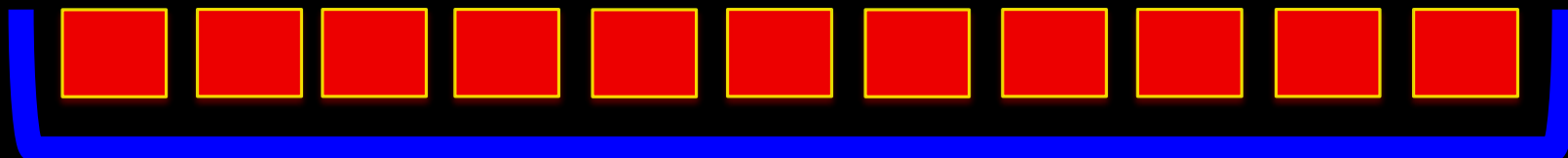
**Course Curriculum**



**Administrative Platform**



**Course Curriculum**



**Administrative Platform**





### Course Curriculum



- 36 credit / 12 course curriculum
- Can be completed part time or fulltime
- Capstone Thesis [or examination]



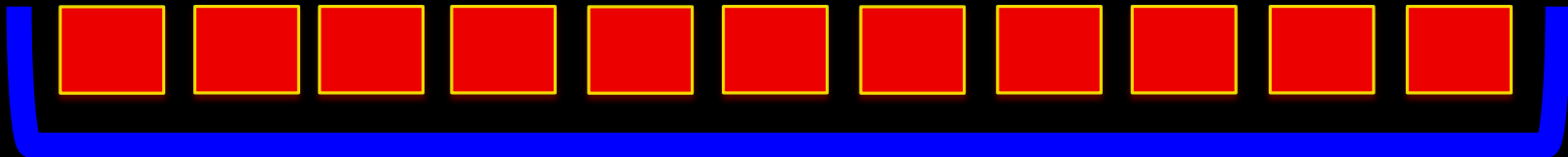
## Course Curriculum

A Closer Look [exact content TBD]

- 1) a general financial mathematics course, discussing both discrete time and continuous time models;
- 2) a course on derivative financial assets and their pricing;
- 3) a course on credit and market risk management;
- 4) an advanced course on life-contingencies;
- 5) an advanced course on risk theory / actuarial models;
- 6) Mathematical modeling course with an emphasis on stochastic simulation and Monte Carlo Methods



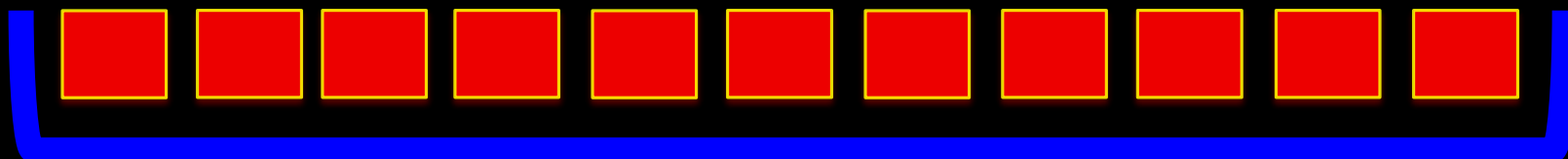
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### Course Curriculum

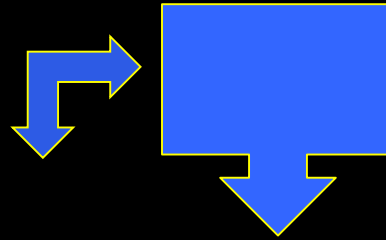


**Administrative Platform**



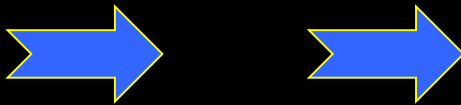
## Department of Mathematics Proposed Master of Science in Actuarial Mathematics

Program Advisory  
(Faculty and Industry)

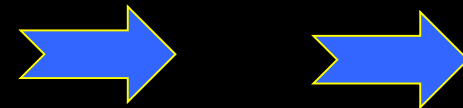


Program Director  
(Faculty Member)

Industry Symposia



Exam Preparation

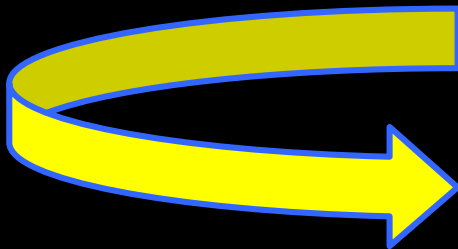


Dedicated Program Coordinator provides full, individualized support to every student



### Administrative Platform

Provision of administrative support  
overseen by the Assistant Dean in  
cooperation with the Department



The goal of faculty and administration is to offer a truly unique, engaging, academically- rigorous, professionally- appropriate program that meets and exceeds the needs of industry and the standards of the Society of Actuaries.



What are the next steps?

Faculty in the Department of Math are developing the curriculum

...but we want to hear your thoughts and ideas!

