ACTUARIAL SCIENCE PROGRAM

University of Illinois at Urbana-Champaign
Actuarial Science Program

The Actuarial Science Program at the University of Illinois at Urbana-Champaign is one of the most prominent and largest in the country, with nearly 400 undergraduate majors and more than 50 graduate students. The program has been designated a Center of Actuarial Excellence by the Society of Actuaries—one of fewer than 20 programs in the U.S. so recognized.

Numerous companies and individuals support the program’s activities. In addition, the energy and dedication of our actuarial science students are revealed in the breadth and number of opportunities for program participation.

- Highly sought after graduates, with more than 30 companies from varied industries coming to campus to recruit
- Partnerships with on-campus insurance research and development centers at the University of Illinois Research Park
- Distinguished program with notable alumni including past presidents of professional organizations and industry leaders
- Comprehensive curriculum on life, property/casualty insurance, and employee benefits
- Casualty Actuarial Society—University Award, inaugural winner
- Distinguished faculty and staff are Fellows of the Society of Actuaries
- Cutting-edge research projects funded by the Society of Actuaries and the Actuarial Foundation
Why become an actuary

Few jobs can offer all the benefits of being an actuary: high starting salary, great opportunities for career and salary growth, job security, and the ability to make a meaningful impact on people’s lives. A degree in actuarial science from the University of Illinois can be your jumping-off point to a satisfying career.

The Actuarial Science Program at Illinois requires students to take courses covering over 80 percent of the material for each of the first five Society of Actuaries (SOA) exams, giving all graduates a strong technical background. The range of courses taken by students mirrors an important fact about the actuarial profession: it is one of the most multidisciplinary of careers.

Employment after graduation

Our graduates find employment at consulting firms such as Aon Hewitt, Deloitte, Mercer, Milliman, PwC, and Willis Towers Watson, and at insurance and financial services companies such as AAIS, Aetna, Allstate, Anthem, CNA, Country Financial, Goldman-Sachs, Liberty Mutual, MGIC, Pinnacle, Sears Holdings, and State Farm.
Actuarial Science Club

Many students take advantage of the opportunity to gain leadership experience, develop communication and teamwork skills, and make contacts in the risk and insurance industries by joining the Actuarial Science Club (ASC). This organization not only creates a sense of community, it brings active learning to a new dimension by involving students directly in mentoring, networking, and career development.

- The Alumni Mentorship Program pairs students with alumni providing the opportunity to build impactful connections and enabling students to experience the profession.
- Field trips to insurance and consulting firm offices across the Midwest give students a deeper look into what it means to be a professional actuary.
- The ASC Workshop Series helps our students develop the necessary skills to smoothly transition into an internship or job position.
- At the “Meet the Firms” event, over 30 companies are on campus to recruit at the annual actuarial science career fair.
- Company presentations are held to inform students about various career opportunities. Pricing, reserving, catastrophes, networking, and communication skills are just a few of the many topics covered.
- Social activities give a students the opportunity to form connections with other students.
Actuarial Science Club
social activities:
• Club dinners
• Semi-formals
• Apartment crawls
• Apple picking
• Ice skating
• Escape rooms
• Fundraisers
• Barn dances
• Spring banquet
Career Services

Career preparation is a top priority for our program. We offer a variety of activities and events that ensure our students will be ready for careers at top actuarial firms. In addition, students have many opportunities to meet actuarial recruiters on campus through our events and activities.

Our career activities include:

- A career fair exclusively for actuaries with over 30 companies attending
- On-campus presentations by over 25 companies directed exclusively at actuarial students
- On-campus interviews for actuarial positions
- Workshops on resume writing, career fair preparation and interviewing that address the unique challenges and opportunities for actuaries
- Field trips sponsored by actuarial employers

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I HAVE WORKED AT RESEARCH PARK FOR SEVEN SEMESTERS AND THE AMOUNT OF DIFFERENT PROJECTS I HAVE COMPLETED HAS MADE ME VERY EXCITED THAT THIS IS WHAT I WILL BE DOING FOR MY CAREER. IT HAS BEEN A GREAT EXPERIENCE CONFIRMING THAT I HAVE MADE THE RIGHT CAREER CHOICE.”

—LEE DRINKWATER (BS 2017)

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Innovations and opportunities

We provide students with hands-on, real-world experiences through partnerships with on-campus research and development centers at the University of Illinois Research Park, through case studies in coursework, and through sponsored contests.

For example the State Farm Research and Development Center, located in the University of Illinois Research Park, provides opportunities for many students to participate in team-based real-world projects.

We periodically offer of special classes, such as an Actuarial Capstone Course, which provides students an opportunity to integrate their various classroom experiences in a real world case-study environment.
Illinois Risk Lab

The Illinois Risk Lab (I-Risk Lab) is intended to facilitate integration of discovery-based learning experience with state-of-the-art academic and practical research in all areas of risk analysis and advanced analytics. Faculty and students collaborate to solve business-oriented research problems.

The I-Risk Lab host seminars throughout the year featuring leading experts in the fields of actuarial science, finance and risk management to educate students about industry trends.

The I-Risk Lab will hosts annual symposiums to showcase its research findings as well as to provide a venue for exchanging research ideas with academics and practitioners in the actuarial and financial services community.

Most of all, the I-Risk Lab is an opportunity for students to gain experience in the research process and develop skills that will be useful for problem solving and project planning throughout their careers. In a world where risks are continuously emerging and evolving, the research program allows students to gain an appreciation for extending their knowledge and capabilities in order to effectively manage those risks.
Faculty research

Housed in the Department of Mathematics, known for its world-renowned probabilists, the Illinois Actuarial Science Program is a unique place for the coalescence of world-class mathematical education and actuarial research.

Our actuarial faculty members are actively involved in a wide range of research projects, many of which are sponsored by the Society of Actuaries and the Actuarial Foundation. Our faculty members also engage in practical research with corporate partners and professional organizations.

Faculty research interests and expertise include:

- Cyber security and insurance
- Risk analysis for public policy making
- Predictive analytics for early warning and signaling of financial crisis
- Future of retirement planning and social welfare
- Catastrophe modeling and risk management
Bachelor of Science in Actuarial Science

The Illinois Actuarial Science Program offers an undergraduate curriculum that prepares students for professional or academic careers in the actuarial and risk management professions.

In addition to foundational mathematics and actuarial courses, our graduates take at least five economics or finance courses to prepare them to see the big picture for the consulting, insurance and financial service industries. These courses are on top of the general education requirements, which allow for exposure to a broad range of topics, including courses in communication and reasoning skills.

Our program provides

- Data analytics focused curriculum
- Most comprehensive coverage of Society of Actuaries and Casualty Actuarial Society actuarial professional exams
- Programming training tailor-made for future actuaries
- Award-winning and credentialed actuarial professors and instructors
- Over 2,500 actuarial science alumni around the world, including several former and current presidents of the Society of Actuaries and Casualty Actuarial Society.
- Experiential learning experiences integrated in classroom teaching and case study coursework
- Strong connection to corporate partners in the insurance industry

Core Courses

- Actuarial Statistics
- Investment & Financial Markets
- Life Contingencies
- Loss Models
- Casualty Actuarial Mathematics
- Statistical Learning
- Stochastic Processes
- Predictive Analytics
- Investment & Financial Markets
- Methods of Applied Statistics
- Actuarial Statistics
Master of Science in Actuarial Science

The Master of Science in Actuarial Science prepares students with quantitative undergraduate degrees for actuarial professional careers. The program offers a unique blend of coursework for both professional training and advanced techniques and opportunities for experiential learning.

### Core actuarial courses

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<tr>
<th>Course</th>
<th>Description</th>
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<tbody>
<tr>
<td>Life Insurance and Pension Mathematics</td>
<td>Tabular and parametric survival models, premium calculations, universal life insurance, pension plans and retirement benefits</td>
</tr>
<tr>
<td>Financial Mathematics</td>
<td>Derivative markets, no-arbitrage pricing and hedging, interest rate models, and other risk management techniques</td>
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<tr>
<td>Loss Data Analytics and Credibility</td>
<td>Actuarial modeling process, loss models in severity and frequency, statistical methods to estimate model parameters</td>
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<tr>
<td>Extreme Value Theory &amp; Catastrophe Modeling</td>
<td>Ratemaking, risk classification, coinsurance, estimation of claim liabilities, financial reporting, catastrophe modeling</td>
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<tr>
<td>Predictive Analytics</td>
<td>Predictive modeling, classification, and clustering, and applications of statistical learning techniques to build predictive models</td>
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<tr>
<td>Statistical Learning</td>
<td>supervised and unsupervised learning, including logistic regression, support vector machines, classification trees, nonparametric regression, cluster analysis and principal components analysis</td>
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<tr>
<td>Risk Modeling and Analysis</td>
<td>Risk measures, stochastic orders, copulas, dependence measures, and their statistical inferences</td>
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Doctor of Philosophy in Mathematics:  
Concentration in Actuarial Science and Risk Analytics

This PhD concentration is intended for students with strong quantitative skills who want to acquire advanced analytical tools for academic careers and research and development careers in insurance, consulting, investment, pension, healthcare, banking and financial services.

The program provides

- World-class mathematical education and actuarial research in a broad scientific environment.
- Full financial support for up to six years.
- Internship opportunities under the nationally renowned NSF-funded Program for Interdisciplinary and Industrial Internships at Illinois (PI4).
- Financial support for presenting and exchanging research at industrial and academic conferences.
- Close collaboration with award-winning faculty members on research projects sponsored by industrial partners, professional organizations and government agencies.
Actuarial Science Program
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