ACTUARIAL SCIENCE (BSB)

An actuary is a business professional who analyzes the financial consequences of risk and uncertainty. They interpret statistics to determine probabilities of accidents, sickness, death, and loss of property from theft and natural disasters. Actuaries use mathematics, statistics and financial theory to study uncertain future events, especially concerning risk management and insurance programs. Actuaries are considered the “financial architects” of the insurance world.

Actuaries are in high demand and work for insurance companies, consulting and investment firms, government, employee benefit departments of large corporations, hospitals, and banks. The field is highly competitive and requires students to pass exams that lead to professional certification by the Society of Actuaries, the Casualty Actuarial Society and other accredited international societies. This program will equip students with the skills needed to pass at least two actuarial exams, which are the industry's standard of gauging expertise for internships and employment, prior to graduation. We have structured our program around these milestones, enabling our students to gain internships in a timely manner and to graduate into full employment.

Program Requirements

<table>
<thead>
<tr>
<th>Quarter Hours</th>
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<tr>
<td>Business Core Requirements</td>
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<td>Liberal Studies Requirements</td>
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<td>Major Requirements</td>
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<tr>
<td>Open Electives</td>
</tr>
<tr>
<td><strong>Total hours required</strong></td>
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</tbody>
</table>

Learning Outcomes:

- Apply the laws of probability and statistics to problems encountered by actuaries on a daily basis.
- Explain the theory of interest and how it is the foundation for derivative securities.
- Explain contingent payment models and how they apply to mitigating financial risks through insurance contracts.
- Organize, and simulate various Life Contingency models in a manner consistent with the insurance industry practice.
- Describe life cycle effects and then explain how different groups of individuals may protect themselves from any harmful effects.
- Calculate the financial costs and benefits of insurance contracts for various individuals given different life cycle assumptions.
- Apply the laws of probability and statistics to problems encountered by actuaries on a daily basis.
- Explain the theory of interest and how it is the foundation for derivative securities.
- Explain contingent payment models and how they apply to mitigating financial risks through insurance contracts. Organize, and simulate various Life Contingency models in a manner consistent with the insurance industry practice.
- Describe life cycle effects and then explain how different groups of individuals may protect themselves from any harmful effects.
- Calculate the financial costs and benefits of insurance contracts for various individuals given different life cycle assumptions.

College Core Requirements

Business Core Requirements

All undergraduate students in the Driehaus College of Business complete foundational courses in the areas of accountancy, economics, finance, management, and marketing. The core curriculum also includes courses that emphasize the increasingly quantitative and technological nature of business, the importance of the entrepreneurial mindset, and how students can use their business education to address important social challenges.

Course Requirements

For a student to complete the Bachelor of Science in Business with a major in Actuarial Science, the following Business Core courses totaling at least 68.0 hours are required:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Quarter Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC 101</td>
<td>INTRODUCTION TO ACCOUNTING I</td>
<td>4</td>
</tr>
<tr>
<td>ACC 102</td>
<td>INTRODUCTION TO ACCOUNTING II</td>
<td>4</td>
</tr>
<tr>
<td>BUS 101</td>
<td>INTRODUCTION TO DRIEHUIS: BUSINESS FUNDAMENTALS AND THE ENTREPRENEURAL MINDSET</td>
<td>4</td>
</tr>
<tr>
<td>BUS 103</td>
<td>BUSINESS FOR SOCIAL GOOD</td>
<td>4</td>
</tr>
<tr>
<td>CSC 241</td>
<td>INTRODUCTION TO COMPUTER SCIENCE I</td>
<td>4</td>
</tr>
<tr>
<td>ECO 105</td>
<td>PRINCIPLES OF MICROECONOMICS</td>
<td>4</td>
</tr>
<tr>
<td>ECO 106</td>
<td>PRINCIPLES OF MACROECONOMICS</td>
<td>4</td>
</tr>
<tr>
<td>FIN 310</td>
<td>INTRODUCTION TO FINANCE</td>
<td>4</td>
</tr>
<tr>
<td>MAT 150</td>
<td>CALCULUS I</td>
<td>4</td>
</tr>
<tr>
<td>MAT 151</td>
<td>CALCULUS II</td>
<td>4</td>
</tr>
<tr>
<td>MAT 152</td>
<td>CALCULUS III</td>
<td>4</td>
</tr>
<tr>
<td>MAT 341</td>
<td>STATISTICAL METHODS USING SAS</td>
<td>4</td>
</tr>
<tr>
<td>MGT 300</td>
<td>PRINCIPLES OF MANAGEMENT</td>
<td>4</td>
</tr>
<tr>
<td>MGT 301</td>
<td>PRINCIPLES OF OPERATIONS MANAGEMENT</td>
<td>4</td>
</tr>
<tr>
<td>MKT 301</td>
<td>PRINCIPLES OF MARKETING</td>
<td>4</td>
</tr>
</tbody>
</table>

Business Communication

Select one of the following:

- MKT 276 EFFECTIVE BUSINESS COMMUNICATION
- CMNS 201 BUSINESS AND PROFESSIONAL COMMUNICATION

Global Business Perspective

Select one of the following:

- ECO 316 EUROPEAN ECONOMIC HISTORY
- ECO 330 RADICAL RESPONSES TO CAPITALISM
- ECO 333 TOPICS IN GLOBAL ECONOMIES
- ECO 334 UNDERSTANDING CHINA'S ECONOMY
- ECO 360 ECONOMICS OF LOW-INCOME COUNTRIES
- ECO 361 INTERNATIONAL TRADE
- ECO 362 INTERNATIONAL MONETARY ECONOMICS
- ECO 363 ECONOMICS OF THE EUROPEAN UNION
- FIN 340 INTERNATIONAL FINANCE
- FIN 355 GLOBAL IPOs & VENTURE CAPITAL
- IB 350 INTERNATIONAL BUSINESS SEMINAR
MGT 354  GLOBAL HUMAN RESOURCE MANAGEMENT
MGT 357  INTERNATIONAL BUSINESS
MKT 340  MARKETING ACROSS CULTURES: A CULTURAL PERSPECTIVE ON MULTICULTURAL MARKETS
MKT 358  MARKETING IN A GLOBAL ENVIRONMENT ((Marketing Honors Students Only))
MKT 360  INTERNATIONAL MARKETING
SOC 217  WORK IN A GLOBALIZED WORLD

A course taken as part of a term-long study abroad program

Actuarial Science majors take CSC 241 for the BSB Business Technology requirement.

Business Ethics
All undergraduate students in the Driehaus College of Business complete a course in Business Ethics. It is recommended students take MGT 248 or PHL 248 in Philosophical Inquiry or MGT 228 or REL 228 in Religious Dimensions in the Liberal Studies Program (or University Honors Program) Requirements.

Second Majors and Minors
The addition of a second major or minor may affect the Business Core classes required for a student. Meet with an academic advisor to confirm requirements.

Math Requirements for Actuarial Science majors
• An Actuarial Science student is expected to complete the Calculus sequence in the first year of study.
• The calculus requirement can be met with one of theses sequences:
  • Calculus: MAT 150, MAT 151, and MAT 152
  • Calculus for Mathematics and Science Majors: MAT 160, MAT 161, and MAT 162
  • Calculus for Life Sciences: MAT 170, MAT 171, and MAT 172
  • Summer Calculus: MAT 155 and MAT 156
• Actuarial Science students do not take Business Calculus MAT 135, MAT 136, or Business Statistics MAT 137.

Grade Minimum Requirements for Actuarial Science Major
A minimum grade of C- is required for the following: ACC 101, ACC 102, BUS 101, BUS 103, ECO 105, (https://catalog.depaul.edu/search/?P=ECO%20105) ECO 106, FIN 310, MAT 150, MAT 151, MAT 152, MAT 341, and any FIN course used for Global Business Perspective.

Liberal Studies Requirements
Honors program requirements can be found in the individual Colleges & Schools section of the University Catalog. Select the appropriate college or school, followed by Undergraduate Academics and scroll down.

<table>
<thead>
<tr>
<th>First Year Program</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chicago Quarter</td>
<td></td>
</tr>
<tr>
<td>LSP 110 DISCOVER CHICAGO</td>
<td>4</td>
</tr>
<tr>
<td>or LSP 111 EXPLORE CHICAGO</td>
<td></td>
</tr>
<tr>
<td>Focal Point</td>
<td></td>
</tr>
</tbody>
</table>

Learning Domains
Arts and Literature (AL) (https://catalog.depaul.edu/undergraduate-core/liberal-studies-program/liberal-studies-learning-domains/arts-and-literature/)
• 3 Courses Required

Historical Inquiry (HI) (https://catalog.depaul.edu/undergraduate-core/liberal-studies-program/liberal-studies-learning-domains/historical-inquiry/)
• 2 Courses Required

• Not Required

Philosophical Inquiry (PI) (https://catalog.depaul.edu/undergraduate-core/liberal-studies-program/liberal-studies-learning-domains/philosophical-inquiry/)
• 2 Courses Required

Religious Dimensions (RD) (https://catalog.depaul.edu/undergraduate-core/liberal-studies-program/liberal-studies-learning-domains/religious-dimensions/)
• 2 Courses Required

Scientific Inquiry (SI) (https://catalog.depaul.edu/undergraduate-core/liberal-studies-program/liberal-studies-learning-domains/scientific-inquiry/)
• 1 Lab Course Required

Social, Cultural, and Behavioral Inquiry (SCBI) (https://catalog.depaul.edu/undergraduate-core/liberal-studies-program/liberal-studies-learning-domains/social-cultural-and-behavioral-inquiry/)
• 1 Course Required

1 PHL 248/ MGT 248 is required in PI or REL 228 / MGT 228 is required in RD.
Notes
Specified required courses within Liberal Studies may have grade minimums (e.g., C- or better). Please consult your advisor or your college and major requirements.

Courses offered in the student’s primary major cannot be taken to fulfill LSP Domain requirements. If students double major, LSP Domain courses may double count for both LSP credit and the second major. Students who choose to take an experiential learning course offered by the major may count it either as a general elective or the Experiential Learning requirement.

In meeting learning domain requirements, no more than one course that is outside the student’s major and is cross-listed with a course within the student’s major, can be applied to count for LSP domain credit. This policy does not apply to those who are pursuing a double major or earning BFA or BM degrees.

Major Requirements

Course Requirements
In addition to FIN 310, a student majoring in Actuarial Science is required to complete the following courses totaling at least 44.0 hours:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Quarter Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>DSC 341</td>
<td>FOUNDATIONS OF DATA SCIENCE</td>
<td>4</td>
</tr>
<tr>
<td>FIN 251</td>
<td>CAREER MANAGEMENT IN ACTUARIAL SCIENCE</td>
<td>0</td>
</tr>
<tr>
<td>FIN 365</td>
<td>PRINCIPLES OF RISK &amp; INSURANCE</td>
<td>4</td>
</tr>
<tr>
<td>MAT 260</td>
<td>MULTIVARIABLE CALCULUS I</td>
<td>4</td>
</tr>
<tr>
<td>MAT 262</td>
<td>LINEAR ALGEBRA</td>
<td>4</td>
</tr>
<tr>
<td>MAT 351</td>
<td>PROBABILITY AND STATISTICS I</td>
<td>4</td>
</tr>
<tr>
<td>MAT 352</td>
<td>PROBABILITY AND STATISTICS II</td>
<td>4</td>
</tr>
<tr>
<td>MAT 353</td>
<td>PROBABILITY AND STATISTICS III</td>
<td>4</td>
</tr>
<tr>
<td>MAT 361</td>
<td>THEORY OF INTEREST</td>
<td>4</td>
</tr>
<tr>
<td>MAT 368</td>
<td>MATHEMATICS FOR FINANCE</td>
<td>4</td>
</tr>
<tr>
<td>or MAT 369</td>
<td>ACTUARIAL SCIENCE SEMINAR</td>
<td></td>
</tr>
</tbody>
</table>

**Elective Pair 1**
- DSC 323  DATA ANALYSIS AND REGRESSION
- DSC 324  ADVANCED DATA ANALYSIS

**Elective Pair 2**
- MAT 356  APPLIED REGRESSION ANALYSIS
- MAT 358  APPLIED TIME SERIES AND FORECASTING

**Elective Pair 3**
- MAT 359  SIMULATION MODELS AND MONTE CARLO METHOD
- MAT 360  GENERALIZED LINEAR MODELS

**Elective Pair 4**
- MAT 362  LIFE CONTINGENCIES I
- MAT 363  LIFE CONTINGENCIES II

**Elective Pair 6**
- MAT 365  LOSS MODELS II
- MAT 364  LOSS MODELS I

Career Management Course
Students are required to complete the Career Course (FIN 251) associated with the major. Students who double major may choose the Career Course (250/251) associated with either major provided that hours for graduation are satisfied. Students should take the Career Course as soon as possible.

Open Electives
Open elective credit (8.0 hours) is needed to meet the minimum graduation requirement of 192 hours.

Graduation Requirements
All Finance (FIN) courses and any course used towards the Actuarial Science major must be completed with a minimum grade of C- and with a combined GPA of 2.000 or higher.