ACTUARIAL SCIENCE MAJOR

Program Overview

The Actuarial Science major seeks to build upon the Jesuit tradition of excellence, as embodied in the GEP, by giving students a strong analytical foundation with which to solve the problems encountered in the management of risk. The Actuarial Science major recognizes that success in the actuarial profession derives from the confluence of insightful business perspectives, rigorous analytical reasoning and a love of learning. The Actuarial Science major bridges the traditional distinction at Saint Joseph’s between the Haub School of Business and the College of Arts and Sciences. To be a successful actuary, analytical skills developed in Mathematics, Financial Mathematics and Economics courses found in the College of Arts and Sciences must be combined with a strong business background utilizing Accounting, Risk Management & Insurance, and Decision & System Sciences courses in the Haub School of Business. The Actuarial Science major is, of necessity, an inter-college and interdisciplinary program. The actuarial profession stresses the ‘love of learning’ component not only in word, but also in deed. Actuaries continue to learn throughout their careers and take great pride in passing the strenuous exams their profession requires for certification. The combination of liberal arts Jesuit values with analytical problem solving skills will uniquely position our graduates to prepare for leadership roles in the field of Actuarial Science.

In addition to the benefits afforded by the Jesuit liberal arts tradition at Saint Joseph’s, the Actuarial Science major has three goals specific to the actuarial profession: First is to maintain a high level of analytical training while providing the business perspectives and love of learning necessary for success in the actuarial profession. Second is to provide students with courses to help them prepare for the first three actuarial exams.* Third is to provide students with courses that allow them to be eligible to receive the Validation by Educational Experience (VEE) credits in three areas (Economics, Accounting and Finance, and Mathematical Statistics) subject to the grade and exam requirements specified by the actuarial societies (Society of Actuaries and Casualty Actuarial Society). Actuarial Science majors will thus be ideally poised to enter the actuarial profession.

*Saint Joseph’s University does not provide actuarial credentials. These credentials are granted solely by the actuarial societies (Society of Actuaries and Casualty Actuarial Society) after a candidate has passed the required professional exams and completed the courses and other requirements specified by these societies. In particular, we do not prepare students to pass all the exams that are necessary to obtain an actuarial credential. Typically, students pass the first few exams in college and then pass the remaining exams while employed. Currently, there are seven actuarial exams that are required to obtain an Associate credential and at least three more actuarial exams to obtain a Fellow credential from either actuarial society. For more information on actuarial credentials, please visit the Society of Actuaries (www.soa.org) or the Casualty Actuarial Society (www.casact.org/).

Learning Goals and Outcomes

Goal 1: Students will master the quantitative and analytical skills required to obtain an entry level position in the actuarial science profession.

Objective 1.1: Students will be able to apply and use the fundamentals tools of calculus and the principles of mathematical proofs to solve applied and theoretical mathematical problems.

Objective 1.2: Students will be able to demonstrate mastery of the computational skills used in probability theory as well as the use of discrete and continuous probability distributions to model various applications in the natural sciences, engineering, finance, insurance and the social sciences.

Objective 1.3: Students will be able to demonstrate understanding of concepts of financial mathematics and how these concepts are applied in the calculation of present and accumulated values of cash flows.

Goal 2: Students will have the knowledge to qualify for professional credentials awarded by the Society of Actuaries and the Casualty Actuary Society and gain background relevant to the actuarial profession.

Objective 2.1: Students will be able to demonstrate their knowledge of macro and micro economics, accounting, financial methods and mathematical statistics and obtain VEE (Validation by Educational Experience) credit from professional actuarial societies. Students will also learn material relevant to actuarial science not covered by VEE.

Objective 2.2: Students will know the content covered in the first three professional actuarial science examinations.

Goal 3: Students will develop strong communication and critical thinking skills.

Objective 3.1: Students will be able to prepare written reports and deliver oral presentations that integrate the best practices of technical writing, business and statistical terminology and critical analysis.

Objective 4.1: Students will be able to conduct quantitative research, i.e. select appropriate statistical methodology, use computer software, and make inferences and predictions using data from applications in finance, economics and other disciplines.

Objective 4.2: Students will be able to demonstrate proficiency in the use of computer software such as EXCEL, statistical software and databases. Students will also be able to do basic computer programming.

The traditional undergraduate programs include 40 courses distributed across three components: A General Education component divided into Signature Courses, Variable Courses, and an Integrative Learning requirement; a Major and Divisional component; and Free Electives. In addition to course requirements as specified in each area, students must complete one certified course in each of the following overlay areas:

1. Diversity, Globalization or Non-western Area Studies,
2. Ethics Intensive, and
3. Writing Intensive. Overlay requirements are part of the forty-course requirement.

General Education Signature Courses

See this page about Signature courses (https://academiccatalog.sju.edu/curricula/#signature). Six courses
General Education Variable Courses
See this page about Variable courses (https://academiccatalog.sju.edu/curricula/#variable). Six to Nine courses

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<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tr>
<td>MAT 161</td>
<td>Calculus I</td>
<td>4</td>
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Natural Science
One semester of any lab-based natural science course

Social Science
ECN 101 Introductory Economics Micro 3

General Education Overlays
See this page about Overlays (https://academiccatalog.sju.edu/curricula/#overlay).

General Education Integrative Learning Component
See this page about Integrative Learning Component (https://academiccatalog.sju.edu/curricula/#integrative-learning). Three courses:

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<tbody>
<tr>
<td>MAT 162</td>
<td>Calculus II</td>
<td>4</td>
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<tr>
<td>ECN 102</td>
<td>Introductory Economics Macro</td>
<td>3</td>
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<tr>
<td>Select one of the following Computer Science courses:</td>
<td>3-4</td>
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<tr>
<td>CSC 115</td>
<td>Intro to Computer Science</td>
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<tr>
<td>CSC 120</td>
<td>Computer Science I</td>
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Total Hours 10-11

Select fifteen courses including the following: 45

MAT 213 Calculus III
MAT 223 Intro Math of Data Science
MAT 226 Introduction to Linear Algebra
MAT 321 Probability
MAT 322 Mathematical Statistics
MAT 424 Regression and Time Series
ACC 101 Concepts of Financial Acct
RMI 200 Introduction to Insurance
ASC 201 Financial Methods in Act Sci
ASC 301 Actuarial Probability
ASC 401 Financial Math - Actuarial Sci
DSS 330 Database Management

Select one of the following Mathematics electives: 3
MAT 238 Differential Equations
MAT 311 Numerical Analy & Comp Tech
MAT 313 Mathematical Optimization
MAT 316 Operations Research
MAT 325 Essentials of Data Science
MAT 425 Machine Learning/Data Science
Course approved by the Actuarial Science program director

Select one Actuarial-related elective including the following: 3-4
CSC 121 Computer Science II