Actuarial Science, M.S.

FOX SCHOOL OF BUSINESS AND MANAGEMENT (http://www.fox.temple.edu)

About the Program

The Fox School of Business and Management offers M.S. programs through which students acquire in-depth knowledge of one business discipline. These programs are ideally suited for the business professional who wishes to develop advanced mastery of one business specialization. Our approach to graduate education helps develop practical expertise through case analyses and presentations, interaction with business practitioners, and team projects. The Fox School prepares students to step immediately into key management roles in highly specialized fields. The Fox School is the region's second largest business graduate school with over 1,300 students studying in 35 graduate business areas of concentration.

Time Limit for Degree Completion: 6 years

Campus Location: Main

Full-Time/Part-Time Status: The degree program can be completed on a full- or part-time basis.

Interdisciplinary Study: Coursework in Mathematics and Statistics is required.

Affiliation(s): Research is supported by Fox School of Business and Management's Advanta Center for Research in Financial Institutions, Center for Healthcare Research and Management, Innovation and Entrepreneurship Institute, and Institute of Global Management Studies. Research interests of the Fox School faculty are also supported by numerous centers and institutes throughout Temple University. The Accounting Department faculty conduct research in earnings manipulation, executive compensation, financial statement disorders, pension accounting, and SEC regulation of accounting.

Ranking: The Fox School of Business and Management is highly ranked. Current ranking information may be viewed at http://www.fox.temple.edu/about-fox/why-fox/rankings/.

Accreditation: All Fox School of Business and Management graduate programs are accredited by the Association to Advance Collegiate Schools of Business (AACSB International).

Areas of Specialization: To gain mastery, students complete a minimum of ten advanced level courses (5000 level or above) beyond either the prerequisites or foundation curricula.

Job Prospects: Graduates of the Fox School's Actuarial Science M.S. program obtain jobs in government, the insurance industry, and consulting.

Non-Matriculated Student Policy: Students with an undergraduate GPA of 3.0 or higher may be allowed to take classes under non-matriculated status. Non-matriculated students may take a maximum of 9 credits. Any additional courses require the student to be matriculated in a program.

Financing Opportunities: The Fox School of Business and Management has a limited number of graduate externships for assignments in academic and administrative departments. Work assignments are generally administrative in nature and may include word and data processing. An extern provides up to 20 hours of service per week. Students are required to submit applications directly to the department in which they wish to be appointed.

Admission Requirements and Deadlines

Application Deadline:

Fall:

• December 10 - Early Decision
• March 1 - Application Deadline
• June 30 - Late Application Deadline

Spring: October 30

Applications are processed as they are received throughout the year. Late applications may be considered for admission.

APPLY ONLINE (http://fox.force.com/SiteLogin) to this Fox graduate program at http://fox.force.com/SiteLogin.

Letters of Reference:

Number Required: 2

From Whom: Professional references from an immediate supervisor, current or past, are preferred. Academic references are acceptable.

Coursework Required for Admission Consideration: Applicants are expected to have earned grades of at least a “B” in each of their college-level calculus (differential, integral, and multivariate) courses. Passage of the first professional examination sponsored by the Society of Actuaries and the
Casualty Actuarial Society may be considered a substitute for the college mathematics requirements, subject to department approval. Prior coursework in mathematical probability and statistics is strongly recommended, although students may be admitted without this background with the understanding that they must include these courses in their first two terms of graduate work.

**Bachelor's Degree in Discipline/Related Discipline:** A baccalaureate degree is required.

**Statement of Goals:** Describes your future goals in specific terms and how the M.S. will assist you in achieving those goals.

**Standardized Test Scores:**
GRE/GMAT: Required. Scores for the GRE typically fall within the following percentile ranges: 50 to 99 Verbal; 80 to 99 Quantitative. Passage of the first professional actuarial examination can be used to offset a marginal quantitative percentile score.

For applicants whose native language is not English, the TOEFL, IELTS, or PTE Academic exam is required:

- **TOEFL:** 100 iBT or 600 PBT minimum
- **IELTS:** 7.5
- **PTE Academic:** 72 minimum

**Resume:** Current resume required.

**Transfer Credit:** Upper-level graduate credits from an AACSB-accredited graduate business program, but not previously applied to a conferred degree, may be transferred into the M.S. program. The credits must be part of the required degree program at Temple University. To be transferred, the grade must be a “B” or better. The Admissions Committee makes recommendations for transferring credits to the department chair. The maximum number of credits a student may transfer is 6.

**Test Waivers:** Passage of the first professional examination sponsored by the Society of Actuaries and the Casualty Actuarial Society may be considered a substitute for the college mathematics requirements, subject to department approval.

### Program Requirements

**General Program Requirements:**

**Number of Credits Required Beyond the Baccalaureate:** 30

**Required Courses:**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AS 5101</td>
<td>Theory of Interest</td>
<td>3</td>
</tr>
<tr>
<td>AS 5102</td>
<td>Actuarial Modeling I</td>
<td>3</td>
</tr>
<tr>
<td>AS 5103</td>
<td>Actuarial Modeling II</td>
<td>3</td>
</tr>
<tr>
<td>AS 5104</td>
<td>Actuarial Modeling III</td>
<td>3</td>
</tr>
<tr>
<td>AS 5105</td>
<td>Actuarial Economics</td>
<td>3</td>
</tr>
<tr>
<td>AS 5106</td>
<td>Actuarial Corporate Finance</td>
<td>3</td>
</tr>
<tr>
<td>AS 5107</td>
<td>Advanced Theory of Interest</td>
<td>3</td>
</tr>
<tr>
<td>RMI 5101</td>
<td>Managing Human Capital</td>
<td>3</td>
</tr>
<tr>
<td>RMI 5104</td>
<td>The Role of Property and Casualty Insurance Sector in Enterprise Risk Management</td>
<td>3</td>
</tr>
<tr>
<td>STAT 8109</td>
<td>Regression, Time Series, and Forecasting for Business Applications</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credit Hours 30

**Culminating Events:** There are no culminating events.

### Contacts

**Program Web Address:**

http://www.fox.temple.edu/specialized-masters/actuarial-science/

**Department Information:**

Fox School of Business and Management
1801 Liacouras Walk
701 Alter Hall (006-22)
Philadelphia, PA 19122
foxinfo@temple.edu
215-204-5890
Submission Address for Application Materials:
http://fox.force.com/SiteLogin

Department Contacts:
Academic Director:
Christopher Moore
Director, M.S. Program in Actuarial Science
christopher.moore@temple.edu
215-204-7293

Specialized Master's Programs Coordinator:
Rachel Carr
Associate Director for Specialized Master's Programs
rcarr@temple.edu
215-204-0574

Courses

AS 5101. Theory of Interest. 3 Credit Hours.
In this course, simple, compound and effective interest functions are analyzed and used in the calculation of present value and future values of various investments. Annuities, loan amortization and bonds are discussed and techniques for computing their values at various dates are explored.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

AS 5102. Actuarial Modeling I. 3 Credit Hours.
This course introduces the discrete and continuous random variables measuring the future lifetime of a person. Among the topics covered are calculation of the mean, variance and probability functions for these random variables, introduction of a present value random variable measuring the present value of a life insurance and annuity benefit, calculation of premiums for life insurance and annuities using interest rates and calculation of reserves for insurance companies, examining future liabilities and inflow.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

Pre-requisites:
AS 5101|Minimum Grade of B-|May be taken concurrently.

AS 5103. Actuarial Modeling II. 3 Credit Hours.
This course introduces multiple life functions that require the use of joint probability functions and the calculation of marginal probability distributions. Additional topics include the calculation of mean and variance for these joint random variables and multiple decrement theory. Various topics from Loss Models are also discussed including computation of mixed distributions through compounding of frequency distributions with severity distributions and the calculation of premiums for insurance policies with deductibles, limits and coinsurance.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

Pre-requisites:
AS 5102|Minimum Grade of B-|May not be taken concurrently.

AS 5104. Actuarial Modeling III. 3 Credit Hours.
Estimation and fitting of survival, frequency and severity, and compound distribution loss models; credibility methods.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.
AS 5105. Actuarial Economics. 3 Credit Hours.
This course develops the conceptual framework of microeconomics and macroeconomics with some applications in actuarial science. It offers the VEE credit for Economics as required by the Society of Actuary. Topics in microeconomics include interaction between supply and demand, consumer behavior, production choices, different types of competition, factor markets, and market failure. Topics in macroeconomics include business cycles, inflation, unemployment, monetary and fiscal policy, balance of payments, international economics, and economic growth.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

AS 5106. Actuarial Corporate Finance. 3 Credit Hours.
This course develops the conceptual framework for corporate finance and financial derivatives from an actuarial perspective. It prepares students for Exam FM and also offers VEE credit for corporate finance as required by the Society of Actuaries. Topics covered in this course include financial statements, asset valuation, capital budgeting, capital structure, the cost of capital and dividend policy. Financial derivatives, such as forwards, futures, swaps, and options, will be discussed in detail, and their application in corporate risk management will be examined.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

AS 5107. Advanced Theory of Interest. 3 Credit Hours.
This course develops the theoretical basis of certain actuarial models and the application of those models to insurance and other financial risks. It prepares students for SOA Exam MFE or CAS Exam 3F. Topics covered in this course include Vasicek and Cox-Ingersoll-Ross bond price models, Black-Derman-Toy binomial model, Black-Scholes option-pricing model, exotic options, Ito's lemma in the one-dimensional case. Simulation of lognormal stock prices and variance reduction techniques will be discussed and delta-hedging in risk management will be demonstrated.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

College Restrictions: Must be enrolled in one of the following Colleges: Business & Mngmnt, Fox School.

Repeatability: This course may not be repeated for additional credits.

Pre-requisites:
AS 5101|Minimum Grade of B-|May not be taken concurrently.

AS 5170. Special Topics. 3 Credit Hours.
Special Topics. Content varies.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may be repeated for additional credit.

AS 5180. Special Topics. 3 Credit Hours.
Special Topics. Content varies.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may be repeated for additional credit.

AS 5182. Independent Study. 1 to 6 Credit Hour.
Special study in a particular aspect of actuarial science under faculty supervision. Maximum of six hours may be counted toward degree requirements.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may be repeated for additional credit.

AS 5190. Special Topics in Actuarial Science. 3 Credit Hours.
Special Topics - Actuarial Science. Content varies.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may be repeated for additional credit.
AS 5196. Casualty Contingencies. 3 Credit Hours.
This highly participative course is designed to broaden perspectives on the business environment in which actuaries work. In addition to analyzing the issues behind daily events, several continuing issues will be analyzed including insurance pricing cycles, regulatory developments, the role of the actuary as an educator, advisor, objective information source and problem solver insurance company financial rating and solvency issues, accounting fraud and questionable financial transactions, insurance and the financial markets managing insurance operations, professional ethics, and the impact of current developments in underwriting, and reinsurance on the actuarial function.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may not be repeated for additional credits.

AS 5282. Independent Study. 1 to 3 Credit Hour.
Independent Study. Focus to be determined by instructor and student.

Level Registration Restrictions: Must be enrolled in one of the following Levels: Graduate.

Repeatability: This course may be repeated for additional credit.