ACTUARIAL SCIENCE AND PREDICTIVE ANALYTICS M.S.

Degree: Master of Science
https://www.towson.edu/fcsm/departments/mathematics/grad/actuarial-science-predictive-analytics/

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The Master of Science in Actuarial Science and Predictive Analytics (ASPA) will prepare students to succeed in a market landscape that has greatly adopted risk management practices and data analytics. The program combines theory, practice and predictive modeling, providing students with critical analytical tools that will enable them to have the right skills to succeed in the marketplace and continue to be industry leaders. The program reflects Towson University’s mission, vision and strategic plan and it is designed to:

- Build an interdisciplinary foundation in actuarial science with emerging technology, predictive modeling and curricular content that encourages “thinking critically and meaningfully.”
- Provide select, high quality programs in professional fields where there is evidence both of need and of corresponding institutional strength. The Master of Science degree in Actuarial Science and Predictive Analytics will produce graduates who can meet the challenges of the actuarial profession today, prepare for the opportunities of tomorrow, and ultimately “enrich the culture, society, economy and environment of Maryland, the region, and beyond.”
- Provide the most current and advanced skill sets and knowledge in the Actuarial Science professional career that align with national trends and span the areas of STEM, business, and finance education.
- Engage students in Maryland, serving communities’ needs and providing our students with varied internship and service learning opportunities through industry relationships, networking opportunities, a capstone and professional practices course and a recommended internship.
- Empower students to achieve their career goals and “enrich the culture, society, economy and environment of Maryland, the region, and beyond” through a careful curricular plan that targets a student’s academic growth while seeking required experiences needed to support career outcomes.

Both full-time and part-time students are encouraged to enroll in the program. Core courses are usually offered in the evening, for the convenience of part-time students.

Accelerated Bachelor's-Master's Program

Students may also earn an M.S. in Science in Actuarial Science and Predictive Analytics through the Department of Mathematics’ accelerated bachelor’s and master’s program. This program allows students to complete their undergraduate and graduate degrees in a shorter time frame.

Please see the Undergraduate Catalog for information on the accelerated bachelor’s-master’s program.

Admission Requirements

Admission to Master of Science degree in Actuarial Science and Predictive Analytics is competitive. The eligibility requirements to be admitted into the program are:

- A baccalaureate degree in mathematics or science or related field from a regionally accredited college or university verified on original transcripts, sent by the institution directly to Towson University. The student should be able to demonstrate a strong mathematics background through grades in mathematics courses; an undergraduate B.S. thesis focused on mathematics, sciences, or risk analysis; or work experience involving actuarial science. GPA (Grade Point Average): at least 3.0 (on 4.0 scale) on the last two years of the baccalaureate degree.
- The applicant’s undergraduate training must have included at least one course in calculus, calculus-based probability, mathematical statistics, and linear algebra, and three courses in calculus. Students with any deficiency in their mathematical background may be admitted conditionally if they are willing to correct such deficiency.

Non-immigrant International Students

Program Enrollment: F-1 and J-1 students are required to be enrolled full-time. The majority of their classes must be in-person and on campus. See the list of programs that satisfy these requirements, and contact the International Student and Scholars Office with questions.

Admission Procedures: See additional information regarding Graduate Admission policies and International Graduate Application online.

**See Exceptions to Policy in Graduate Admissions.

Degree Requirements

The student is required to successfully complete at least 10 courses (Students may need to take more than 10 courses if prerequisites are not met) and pass at least two Society of Actuaries professional exam (before or during the graduate study).

The 10-course (a minimum of 30 units) requirement is indicated below:

a. At least six courses from List A
b. At least four courses from List B

- At most three 500-level courses from List A and List B will count toward the degree

List A

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 512</td>
<td>THEORY OF INTEREST</td>
<td>4</td>
</tr>
<tr>
<td>MATH 538</td>
<td>LONG-TERM ACTUARIAL MODELS I</td>
<td>4</td>
</tr>
<tr>
<td>MATH 542</td>
<td>SHORT-TERM ACTUARIAL MODELS</td>
<td>4</td>
</tr>
<tr>
<td>MATH 548</td>
<td>LONG-TERM ACTUARIAL MODELS II</td>
<td>3</td>
</tr>
<tr>
<td>MATH 585</td>
<td>MATHEMATICAL FINANCE</td>
<td>3</td>
</tr>
<tr>
<td>MATH 586</td>
<td>RISK MANAGEMENT AND FINANCIAL ENGINEERING</td>
<td>3</td>
</tr>
<tr>
<td>MATH 639</td>
<td>LOSS MODELS</td>
<td>4</td>
</tr>
<tr>
<td>MATH 641</td>
<td>ENTERPRISE RISK MANAGEMENT</td>
<td>3</td>
</tr>
<tr>
<td>MATH 642</td>
<td>CREDIBILITY AND SIMULATION</td>
<td>3</td>
</tr>
</tbody>
</table>
Master of Science in Actuarial Science and Predictive Analytics program is to prepare students with a foundational understanding in predictive analytics to ensure students stay current in the evolving actuarial profession, prepare them for tomorrow’s challenges and “continues to meet the needs of employers and other users of actuarial services.”¹ At the completion of the program, students are expected to demonstrate the following student learning outcomes:

a. Assess and elucidate the theoretical and historical foundations of actuarial science and predictive analytics.

b. Choose and defend the choice of mathematical models and technologies to conduct predictive analyses, financial evaluations and risk management assessments.

c. Compare and contrast the principles and procedures of various methodologies to implement practical and technical aspects of actuarial science and predictive analytics.

d. Design and conduct a financial project, analyze the findings, and convey the results through professional oral and written reports and graphics that reflect actuarial science standards.

¹ Society of Actuaries: Plain Talk: Curriculum Review