

# UW-MADISON ACTUARIAL PROGRAM COURSES

## Notes:

1. The following tables list different UW-Madison actuarial program course options for your students. “Additional courses” are in addition to the three courses identified in the **Base Plan**:
  - Table 1: **Base Plan** (four courses, 8 credits total)
  - Table 2: **Base Plan + Life Contingencies** (two additional courses, 14 credits total)
  - Table 3: **Base Plan + Loss Models** (two additional courses, 14 credits total)
  - Table 4: **Base Plan + Life Contingencies + Loss Models** (four additional courses, 20 credits total)
  - Table 5: **Additional Analytics courses** that can be added to any of the above plans (three courses, each 3 credits)
2. The **Base Plan** lists the courses that provide an introduction to the actuarial profession and cover the material on the first two professional exams of the Society of Actuaries (SOA) and the Casualty Actuarial Society (CAS).
  - ACT SCI 365: provides an introduction to actuarial science (offered in Spring 2022)
  - ACT SCI 300: reviews probability on SOA Exam P/CAS Exam 1
  - ACT SCI 301 and 303: covers interest theory on SOA Exam FM/CAS Exam 2
3. We are flexible in offering a combination of courses that best accommodates your instructional goals.

Date: 10/18/2021

**Table 1: Base Plan (8 credits total)**

<b>Course (Credit Hours)</b>	<b>Description</b>	<b>Semester(s) Offered (Earliest Class Level)</b>	<b>Relationship to Professional Actuarial Exams</b>
<p><b>ACT SCI 365: Foundations of Actuarial Applications (aka ACT SCI 101)</b> (3 credits)</p> <p><b>Pre-reqs:</b> First semester calculus.</p>	<p>For students interested in a career as an actuary. Evaluates facets of actuarial practice through case studies and other hands-on work.</p>	<p>Spring 2022</p> <p>(Freshman or Sophomore)</p>	<p>None</p>
<p><b>ACT SCI 300: Actuarial Science Methods I</b> (1 credit)</p> <p><b>Pre-reqs:</b> Already taken a probability course.</p>	<p>Review calculus-based probability concepts and methods, covered in a first course in probability. Prepare students for SOA Exam P / CAS Exam 1.</p>	<p>Fall, Spring, Summer</p> <p>(Sophomore)</p>	<p>Exam P/1 (Probability)</p>
<p><b>ACT SCI 301: Actuarial Science Methods II</b> (1 credit)</p> <p><b>Pre-reqs:</b> Taking Act Sci 303 concurrently or an equivalent course.</p>	<p>Discussion course for ACT SCI 303, to focus on preparing students for SOA Exam FM / CAS Exam 2.</p>	<p>Fall, Spring</p> <p>(Freshman or Sophomore)</p>	<p>Exam FM/2 (Financial Mathematics)</p>
<p><b>ACT SCI 303: Theory of Interest</b> (3 credits)</p> <p><b>Pre-reqs:</b> Already taken the second semester calculus course on series and sums.</p>	<p>Theory and applications pertaining to the time value of money.</p>	<p>Fall, Spring</p> <p>(Freshman or Sophomore)</p>	<p>Exam FM/2 (Financial Mathematics)</p>

**Table 2: Base Plan + Life Contingencies (14 credits total)**

Course (Credit Hours)	Description	Semester(s) Offered (Earliest Class Level)	Relationship to Professional Actuarial Exams
<p><b>ACT SCI 650: Actuarial Mathematics I</b> (3 credits)</p> <p><b>ACT SCI 651: Actuarial Mathematics II</b> (3 credits)</p> <p><b>Pre-reqs:</b> Already taken probability and interest theory classes</p>	<p>Two-semester sequence covering the foundations of life contingencies.</p>	<p>Fall, Spring</p>	<p>SOA Exam LTAM (Long Term Actuarial Mathematics)</p>

**Table 3: Base Plan + Loss Models (14 credits total)**

Course (Credit Hours)	Description	Semester(s) Offered (Earliest Class Level)	Relationship to Professional Actuarial Exams
<p><b>ACT SCI 652: Loss Models I</b> (3 credits)</p> <p><b>Pre-reqs:</b> Taking a statistics class concurrently or in the past.</p> <p><b>ACT SCI 653: Loss Models II</b> (3 credits)</p>	<p>Two-semester sequence covering the foundations of loss data analytics.</p>	<p>Fall, Spring</p>	<p>SOA Exam STAM (Short Term Actuarial Mathematics)</p> <p>Helpful for CAS Exam MAS-1</p>

**Table 4: Base Plan + Life Contingencies + Loss Models (20 credits total)**

Course (Credit Hours)	Description	Semester(s) Offered (Earliest Class Level)	Relationship to Professional Actuarial Exams
<p><b>ACT SCI 650: Actuarial Mathematics I</b> (3 credits)</p> <p><b>Pre-reqs:</b> Already taken probability and interest theory classes</p> <p><b>ACT SCI 651: Actuarial Mathematics II</b> (3 credits)</p>	<p>Two-semester sequence covering the foundations of life contingencies.</p>	<p>Fall, Spring</p>	<p>SOA Exam LTAM (Long Term Actuarial Mathematics)</p>
<p><b>ACT SCI 652: Loss Models I</b> (3 credits)</p> <p><b>Pre-reqs:</b> Taking a statistics class concurrently or in the past.</p> <p><b>ACT SCI 653: Loss Models II</b> (3 credits)</p>	<p>Two-semester sequence covering the foundations of loss data analytics.</p>	<p>Fall, Spring</p>	<p>SOA Exam STAM (Short Term Actuarial Mathematics)</p> <p>Helpful for CAS Exam MAS-1</p>

**Table 5: Additional Analytics courses that can be added to any of the above plans (three courses, each 3 credits)**

<b>Course (Credit Hours)</b>	<b>Description</b>	<b>Semester(s) Offered (Earliest Class Level)</b>	<b>Relationship to Professional Actuarial Exams</b>
<b>ACT SCI 654: Regression and Time Series for Actuaries</b> (3 credits)  <b>Pre-reqs:</b> Already taken a statistics class.	Linear regression and correlation; generalized linear regression models; introduction to time series; time series model building and forecasting with focus on data of interest to actuaries.	Fall, Spring	SOA Exam SRM and PA (Statistics for Risk Modeling; Predictive Analytics)  Helpful for CAS Exam MAS-1
<b>ACT SCI 655: Health Analytics</b> (3 credits)  <b>Pre-reqs:</b> Already taken a statistics class.	Provides an introduction to the broad area of health, integrating how researchers from multiple perspectives have investigated various aspects of health, along with the hands-on practice of learning and using statistical tools to analyze these topics.	Spring	SOA Exam SRM and PA (Statistics for Risk Modeling; Predictive Analytics)
<b>GEN BUS 656: Machine Learning for Business Analytics</b> (3 credits)  <b>Pre-reqs:</b> Already taken a statistics class.	An introduction to machine learning techniques in business.	Fall	SOA Exam SRM and PA (Statistics for Risk Modeling; Predictive Analytics)  Helpful for CAS Exam MAS-2