ACTUARIAL SCIENCE MAJOR

As of May 2023

Intended for students entering Purdue Fall 2023 or later

(Interdisciplinary Math/Stat Actuarial Science ACSC)

Introduction:

The interdisciplinary actuarial science major, administered jointly by the Department of Mathematics and the Department of Statistics, provides the broad quantitative background in mathematics, statistics, finance, economics and business necessary for success in the actuarial profession. Career information is available on our web page (www.math.purdue.edu/actuary).

Graduation Requirements are:

a) Interdisciplinary Departmental Requirements

Mathematics (MA):

Calculus: one of the sequences terminating in MA 26100, or 27101
Linear Algebra: MA 35100
Differential Equations: MA 36600
Mathematical Theory of Interest: MA 37300
Advanced Short Term Actuarial Mathematics: MA 490000

Statistics (STAT):

Statistical Theory: STAT 41700
Applied Regression: STAT 51200

Actuarial Models-Life Contingencies: STAT 47201
Advanced Long Term Actuarial Mathematics: STAT 47501
Short Term Actuarial Models: STAT 47902
Statistics for Risk Modeling: STAT 47401
Statistics for Risk Modeling II: STAT 490000
Introduction To Arbitrage-Free Pricing Of Financial Derivatives: STAT 47301
Time Series: STAT 42000

Jointly listed Mathematics and Statistics Class (MA/STAT):

Basic Probability: MA/STAT 41600

Computer Science (CS):

An approved introductory programming class such as CS 15900/17600/17700/18000 or CNIT 17500

Management (MGMT, ECON):

Introductory Accounting and Management Accounting: MGMT 20000 *(Actuarial Science majors may not use MGMT 20010 as it does not meet the pre-requisites for MGMT 20100)* and 20100
Microeconomics and Macroeconomics: ECON 25100 and 25200
Financial Management: MGMT 31000

b) 2.5 minimum GPA in courses required for the major excluding Calculus I, II, and III.

c) A total of 120 (or more) credits must be completed to graduate from the College of Science. At least 32 of these credits must be taken in residence at Purdue, in accordance with University regulations (at the 30000 level or above).

d) Meet the College of Science Core requirements. For a list, see the following website: https://www.purdue.edu/science/Current_Students/curriculum_and_degree_requirements/college-of-science-core-requirements.html . Academic advisors are happy to help both with course selections and

interpreting the regulations. **It is the student's responsibility to see that all requirements are fulfilled.**

e) Meet the University Core requirements. For a list, see the following website: http://www.purdue.edu/provost/initiatives/curriculum/course.html

f) There are also requirements within the University Regulations, please visit the current catalog and view ACADEMIC REGULATIONS for more details.

g) Grade Options: All required courses must be taken for a letter grade. Only General Education courses at the 500 level (for the College of Science Core requirement) and free electives (courses not used to meet specific requirements but used toward the minimum 120 credits) may be taken with a Pass/No Pass option. On the P/NP option a C- must be earned in order to pass the course. A maximum of two courses per year can be taken on P/NP and count toward credits for graduation. See the College of Science catalog for more information.

Additional Information:

a) Pre-requisite courses may have minimum grade requirements.

b) Students may view their plan of study audit through myPurduePlan.

c) For students entering Purdue prior to Fall 2018, see an academic advisor for information concerning degree requirements.

Double Major in Actuarial Science and Statistics:

The Actuarial Science Program fulfills all of the requirements for the Applied Statistics Major, and you are encouraged to declare Applied Statistics as a second major. Applied Statistics Major GPA requirements must also be met to obtain this major.

Interdisciplinary Math/Stat Actuarial Science (ACSC):

To become an "Actuary," you must become an Associate, and ultimately a Fellow, of one of the professional societies (Society of Actuaries (SOA) or Casualty Actuarial Society(CAS)). This requires passing nine or ten actuarial exams. In 2018, both actuarial organizations changed their credentialing requirements. The Purdue program has already been adjusted to reflect these changes. Our program provides preparation for the first six actuarial exams of the SOA (FM, P, LTAM, IFM, STAM, and SRM) and the first five actuarial exams of the CAS (FM, P, IFM, and MAS I). **To be competitive in the job market, it is almost essential to pass both the P and FM exams before interviewing in the fall of the senior year. It is also crucially important to get good grades**; many employers have a grade cutoff of 3.0 or higher. All exams except for LTAM are computer based exams currently administered nationally by Thompson Prometric. (In Lafayette, the test site is the Sylvan Learning Ctr, 4050 Britt Farm Drive.) The FM and P exams are offered six time per year while the other SOA exams are offered three times per year. Check www.soa.org for the test schedule and application deadlines. The LTAM, MAS I and MAS II exams are given at the end of April and October with respective application deadlines of around mid-March and mid-September. Information and application materials for the exams are available on the Actuarial Society's web page (www.soa.org or www.casact.org). Specifically, the relation between class work and exams is:

Exam FM (Mathematical Finance): MA 37300

Exam P (Probability): MATH/STAT 41600. The prep class MATH/STAT 25000 is recommended.

Exam SRM (Statistics for Risk Modeling): STAT 41700, STAT 42000, and STAT 490SRM. Most of material is in STAT 490SRM but STAT 41700 is a co-req and STAT 420 is advisable.

Exam FAM (Fundamentals of Actuarial Mathematics): STAT 47201, STAT 47301, and STAT 47902. Only a small portion of STAT 47301 is covered by this exam.

Exam ALTAM (Advanced Long Term Actuarial Mathematics): STAT 47501 or **Exam ASTAM (Advanced Short Term Actuarial Mathematics):** STAT 490 ASTAM
The student only takes one of ALTAM or ASTAM. Therefore, the student must only take of STAT 47501 or STAT 490 ASTAM.

Exam MAS I (Modern Actuarial Statistics I): STAT 41700, STAT 42000, STAT 490SRM, and STAT 47902

Besides exams, the SOA also requires "validated by educational experience" (VEE) of three topics. Individuals may apply for this credit after completion of the required course work with at least a B- and **after passing two SOA/CAS actuarial exams.**

Economics: ECON 25100 (or ECON 34000) and ECON 25200 (or ECON 35200)

Mathematical Statistics: STAT 35000 and STAT 41700

Accounting and Finance: MGMT 20000 and MGMT 31000 and MGMT 41100

Many actuarial students have summer internships. Interviews for internships (as well as permanent jobs) are coordinated by the Purdue Actuarial Club (http://web.ics.purdue.edu/~actuary/).

HONORS PROGRAM
(Honors Interdisciplinary Math/Stat Actuarial Science ASHO)

To graduate with Honors in Actuarial Science, the candidate must:

(a) Obtain a cumulative GPA of at least 3.30.

(b) Obtain at least a "B-" in each of the following classes: ECON 25100 (or ECON 34000), 25200 (or ECON 35200), MGMT 31000 (or MGMT 30400), 41100.

(c) Obtain at least an average GPA of 3.5 in the following set of classes: STAT 41700, 47201, 47301, 47902.

(d) Obtain grades of at least a "B" in all of the mathematics and statistics classes required for the actuarial science degree. (Exceptions may be granted on a case-by-case basis.)

(e) Provide documentation to the Director of the Actuarial Science Program or your academic advisor prior to the end of classes in the semester of graduation of having received passing scores on two of the Society of Actuaries (SOA) or Casualty Actuarial Society (CAS) actuarial exams.

Students interested in pursuing the honors degree should inform their academic advisor. There are no formal prerequisites for entering the program. This program is separate from the University Honors College program. Graduation with Honors in Actuarial Science will be indicated by the words "Actuarial Science Honors" appearing on the transcript.

Management Minor:

The Management Minor offered by Krannert School of Management is encouraged for Actuarial majors. Courses required for the Actuarial Science Program also meet most of the requirements for the Management minor. One additional course beyond the required courses for the Actuarial major is required for the Management minor. Students may choose from MGMT 41100, ECON 34000 or ECON 35200 to meet this requirement.

Recommended Courses:

College of Science:

Introduction to Actuarial Science: MA/STAT 17000
Problem Solving for Actuarial Course I Exam: MA/STAT 25000 (prerequisites MA 26100, or equivalent, and MA/STAT 41600 (STAT 51600))
Life Contingencies II: STAT 47500

School of Management:

Investment Management: MGMT 41100 (prerequisite MGMT 31000). *Required for the SOA "Corporate Finance Validation" and for the Honors Degree.*
Legal Background for Business I: MGMT 45500

College of Technology:

Data Base Application Development (Programming Microsoft Access): CNIT 18000
Visual Programming (Visual Basic Programming): CNIT 17500

Warning: CNIT 17500 can be used to fulfill the CS requirement for ***Actuarial Science students only****. CNIT 18000* ***will not count*** for credit toward any College of Science degree.