BS in Actuarial Science (695224) MAP Sheet

Physical and Mathematical Sciences, Statistics

For students entering the degree program during the 2022-2023 curricular year.

University Core and Graduation Requirements

University Core Requirements:

Requirements	#Classes	Hours	Classes
Religion Cornerstones			
Teachings and Doctrine of The Book of Mormon	1	2.0	from approved list
Jesus Christ and the Everlasting Gospel	1	2.0	from approved list
Foundations of the Restoration	1	2.0	REL C 225
The Eternal Family	1	2.0	from approved list
The Individual and Society			
American Heritage	1-2	3-6.0	ECON 110* and one course from approved list
Global and Cultural Awareness	1	3.0	from approved list
Skills			
First Year Writing	1	3.0	from approved list
Advanced Written and Oral Communications	1	3.0	from approved list
Quantitative Reasoning	1	4.0	MATH 112*
Languages of Learning (Math or Language)	1	4.0	MATH 112*
Arts, Letters, and Sciences			
Civilization 1	1	3.0	from approved list
Civilization 2	1	3.0	from approved list
Arts	1	3.0	from approved list
Letters	1	3.0	from approved list
Biological Science	1	3-4.0	from approved list
Physical Science	1	3.0	from approved list
Social Science	1	3.0	from approved list
Core Enrichment: Electives			
Religion Electives	3-4	6.0	from approved list
Open Electives	Variable	Variable	personal choice

*THESE CLASSES FILL BOTH UNIVERSITY CORE AND PROGRAM REQUIREMENTS (7 hours overlap)

Graduation Requirements:

Minimum residence hours required	30.0
Minimum hours needed to graduate	120.0

Suggested Sequence of Courses

FRESHMAN YEAR

1st Semester

First Year Writing	3.0
Social Science	3.0
MATH 112 (FWSpSu)	4.0
STAT 121	3.0
STAT 130	0.5
Religion Cornerstone course	2.0
Total Hours	**15.5**

2nd Semester

American Heritage	3.0
MATH 113 (FWSpSu)	4.0
STAT 274	3.0
STAT 240	3.0
Religion Cornerstone course	2.0
Total Hours	**15.0**

Dept. recommendation: Register for and pass Exam FM.

SOPHOMORE YEAR

3rd Semester

STAT 230	3.0
STAT 250	3.0
Physical Science	3.0
Global and Cultural Awareness	3.0
Religion Cornerstone course	2.0
Total Hours	**14.0**

4th Semester

MATH 213	2.0
MATH 215	1.0
STAT 340	3.0
Letters	3.0
Religion Cornerstone course	2.0
Open Electives	4.0
Total Hours	**15.0**

Department recommendation: Register for and pass Exam P. Internship during Spring/Summer. Much of the hiring occurs the previous fall.

JUNIOR YEAR

5th Semester

STAT 330	3.0
STAT 344	3.0
General Elective	1.5
Advanced Written & Oral Communication	3.0
Civilization 1	3.0
Religion Elective	2.0
Total Hours	**15.5**

6th Semester

STAT 346	3.0
IS 520 or other Requirement 4 Elective	3.0
Civilization 2	3.0
Biological Science	3.0
Religion Elective	2.0
Open Elective	1.0
Total Hours	**15.0**

Department recommendation: Internship during Spring/Summer. Much of the hiring occurs the previous fall.

SENIOR YEAR

7th Semester

STAT 348	3.0
STAT 446	3.0
Requirement 7 Elective #1	3.0
Religion Elective	2.0
Open Elective	4.0
Total Hours	**15.0**

8th Semester

Requirement 7 Elective #2	3.0
STAT 444 (will count for Requirement 7 Elective #3)	3.0
Arts	3.0
Open Electives	6.0
Total Hours	**15.0**

Note 1: Students should take STAT 130 the semester they declare themselves as a Statistics Major.

Note 2: The sequence of courses suggested may not fit the circumstances of every student. Students should contact their college advisement center for help in outlining an efficient schedule.

Note 3: Students are encouraged to complete an average of 15 credit hours each semester or 30 credit hours each year, including spring and/or summer terms, to meet the 120 credit minimum needed to graduate. Taking fewer credits substantially increases the number of semesters to graduate.

Note 4: Open elective credits can be classes of your choosing, classes for a minor, or credits that have already been earned through AP classes, transfer credits, etc.

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2022-2023 Program Requirements (56.5 Credit Hours)

Students must pass one exam of the Society of Actuaries (SOA), usually Exam FM, before declaring an actuarial science major. Students should declare another statistics emphasis until they pass an exam (Applied Statistics and Analytics offers an unofficial pre-actuarial path with early courses).

REQUIREMENT 1 Complete 3 courses

STAT 121 - Principles of Statistics	3.0
STAT 130 - Introduction to the Department of Statistics	0.5
STAT 274 - Theory of Interest	3.0

REQUIREMENT 2 Complete 5 courses

STATISTICS CORE COURSES:

STAT 230 - Statistical Modeling 1	
STAT 240 - Probability and Inference 1	3.0
STAT 250 - Applied R Programming	3.0
STAT 330 - Statistical Modeling 2	
STAT 340 - Probability and Inference 2	3.0

REQUIREMENT 3 Complete 4 courses

MATHEMATICAL FOUNDATION COURSES:

*MATH 112 - Calculus 1	4.0
MATH 113 - Calculus 2	4.0
MATH 213 - Elementary Linear Algebra	2.0
MATH 215 - Computational Linear Algebra	1.0

REQUIREMENT 4 Complete 3.0 hours from the following course(s)

RECOMMENDED COURSE: ACTUARIAL SCIENCE MAJORS SHOULD TAKE IS 520, BUT ALL OF THE COURSES ARE VALUABLE.

C S 111 - Introduction to Computer Programming	3.0
HLTH 440 - Introduction to Statistical Computing in Epidemiology (SAS)	3.0
IS 520 - Business Programming and Spreadsheet Automation	3.0
STAT 286 - Data Science Ecosystems	3.0

REQUIREMENT 5 Complete 3 courses

STAT 344 - Foundations of Long-term Actuarial Mathematics	3.0
STAT 346 - Foundations of Short-term Actuarial Mathematics	3.0
STAT 348 - Statistics for Risk Modeling	3.0

REQUIREMENT 6 Complete 3.0 hours from the following course(s)

NOTE: IF BOTH COURSES ARE TAKEN IN REQUIREMENT 6, ONE CAN BE USED AS AN ELECTIVE IN REQUIREMENT 7. STUDENTS INTERESTED IN LIFE, FINANCE, OR PENSIONS SHOULD TAKE 444 AND THOSE INTERESTED IN HEALTH OR PROPERTY/CASUALTY SHOULD TAKE 446.

STAT 444 - Advanced Long-term Actuarial Mathematics	3.0
STAT 446 - Advanced Short-term Actuarial Mathematics	3.0

REQUIREMENT 7 Complete 9.0 hours from the following course(s)

NOTE: COURSES USED TO FULFILL REQUIREMENTS 4 AND 6 WILL NOT DOUBLE COUNT HERE. NOTE: NO MORE THAN 3.0 HOURS OF ANY COMBINATION OF STAT 496R AND STAT 497R CAN BE USED FOR THIS REQUIREMENT.

ACC 200 - Principles of Accounting	3.0
ECON 110 - Economic Principles and Problems	3.0
FIN 201 - Principles of Finance	3.0
IS 515 - Adv Spreadsheets Bus Analysis	
IS 520 - Business Programming and Spreadsheet Automation	3.0
STAT 234 - Methods of Survey Sampling	3.0
STAT 251 - Introduction to Bayesian Statistics	3.0
STAT 286 - Data Science Ecosystems	3.0
STAT 381 - Statistical Computing	3.0
STAT 386 - Data Science Process	3.0
STAT 395R - Special Topics in Applied Statistics	3.0v
You may take up to 3 credit hours.	
STAT 435 - Nonparametric Statistical Methods	3.0
STAT 437 - Applications in Biostatistics	3.0
STAT 444 - Advanced Long-term Actuarial Mathematics	3.0
STAT 446 - Advanced Short-term Actuarial Mathematics	3.0
STAT 451 - Applied Bayesian Statistics	3.0
STAT 466 - Introduction to Reliability	3.0
STAT 469 - Analysis of Correlated Data	3.0
STAT 482 - Data Science Capstone 1	3.0
STAT 483 - Data Science Capstone 2	3.0
STAT 486 - Machine Learning	3.0
STAT 495R - Special Topics in Statistics	3.0v
You may take up to 3 credit hours.	
STAT 496R - Academic Internship: Statistics	9.0v
You may take up to 3 credit hours.	
STAT 497R - Introduction to Statistical Research	3.0v
You may take up to 3 credit hours.	
STAT 531 - Experimental Design	3.0

Recommended Courses: Students should take Econ 110, Acc 200, and Fin 201 to complete the Society of Actuaries VEEs. Additionally, IS 515 and IS 520 are valuable in the daily work of an actuary.

THE DISCIPLINE:

An actuary is a statistician who analyzes the financial consequences of risk. Actuaries use statistics, mathematics, and financial theory to study uncertain future events, especially those of concern to insurance and pension programs. They evaluate the likelihood of those events and design creative ways to reduce the likelihood and decrease the impact of adverse events that do occur. Their work designing and managing programs that control risk requires a combination of strong analytical skills, business knowledge, and understanding of human behavior.

CAREER OPPORTUNITIES:

Actuaries enjoy excellent job security, high incomes, and a low-stress work environment. Careers in actuarial science are consistently ranked among the top professions. Competent actuaries are highly recruited and can have many professional opportunities. Actuaries are employed across a wide variety of industries and typically become established in one of the following career tracks: health, property/casualty, or life insurance, consulting to one of those industries, enterprise risk management, quantitative finance and investment management, or retirement benefits. By focusing on the development of data analysis skills, actuaries can also easily transition to business analytics settings

ACTUARIAL EXAMS:

Actuaries are required to demonstrate their proficiency by passing a series of competency exams offered by one or more of the principal actuarial societies. It typically takes 6-10 years to pass all of the exams; most actuarial interns are required to have passed at least one of these exams as a condition for employment. The BYU Actuarial Science degree provides students with the opportunity to study significant portions of the material covered in the first eight exams accepted by the Society of Actuaries and six accepted by the Casualty Actuarial Society (the two major actuarial societies in the United States).

The correspondence between the actuarial exams and available BYU course work is roughly as follows:

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2022-2023

Joint SOA/CAS Exams:
Exam P: Stat 240, 340 (full coverage)
Exam FM: Stat 274 (full coverage)
SOA Exams: Exam FAM: Stat 344, 346 (full coverage)
Exam SRM/PA: Stat 330, 348 (full coverage)
Exam ALTAM: Stat 444 (full coverage)
Exam ASTAM: 446 (full coverage)
Exam ATPA: Stat 251, 330, 348, 451 (some coverage)

CAS Exams:
Online Course 3: Stat 330, 348 (full coverage)
MAS-I: Stat 348 (full coverage)
MAS-11: Stat 251, 348 (full coverage)
Exam 5: Stat 346, 446 (some coverage)

In addition to the exams the societies accept the following sets of courses for the Validation by Educational Experience (VEE) credit:

Mathematical Statistics VEE: Stat 121, 346
Finance and Accounting VEE: Fin 201, Acc 200
Economics VEE: Econ 110

MAP DISCLAIMER

While every reasonable effort is made to ensure accuracy, there are some student populations that could have exceptions to listed requirements. Please refer to the university catalog and your college advisement center/department for complete guidelines.

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