

# BS in Actuarial Science (695224) MAP Sheet

Physical and Mathematical Sciences, Statistics

For students entering the degree program during the 2023-2024 curricular year.



| University Core and Graduation Requirements   |                 |              |   | Suggested Sequence of Courses  |             |   |             |
|---|-----------------|--------------|---|--|-------------|---|-------------|
| <b>University Core Requirements:</b>  |                 |              |   |  |             |   |             |
| <b>Requirements</b>   | <b>#Classes</b> | <b>Hours</b> | <b>Classes</b>                              |  |             |   |             |
| <b>Religion Cornerstones</b>  |                 |              |   |  |             |   |             |
| 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                          |  |             |   |             |
| <b>The Individual and Society</b>   |                 |              |   |  |             |   |             |
| 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                          |  |             |   |             |
| <b>Skills</b>   |                 |              |   |  |             |   |             |
| 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*                                   |  |             |   |             |
| <b>Arts, Letters, and Sciences</b>  |                 |              |   |  |             |   |             |
| 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                          |  |             |   |             |
| <b>Core Enrichment: Electives</b>   |                 |              |   |  |             |   |             |
| 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) |                 |              |   |  |             |   |             |
| <b>Graduation Requirements:</b>   |                 |              |   |  |             |   |             |
| Minimum residence hours required  |                 | 30.0         |   |  |             |   |             |
| Minimum hours needed to graduate  |                 | 120.0        |   |  |             |   |             |
|   |                 |              |   | <b>FRESHMAN YEAR</b>   |             |   |             |
|   |                 |              |   | <u>1st Semester</u>  |             |   |             |
|   |                 |              |   | First Year Writing   | 3.0         | STAT 330  | 3.0         |
|   |                 |              |   | Social Science   | 3.0         | STAT 344  | 3.0         |
|   |                 |              |   | MATH 112 (FWSpSu)  | 4.0         | Requirement 4 Elective #1                           | 1.5         |
|   |                 |              |   | STAT 121   | 3.0         | Advanced Written & Oral Communication               | 3.0         |
|   |                 |              |   | STAT 130   | 0.5         | Civilization 1                                      | 3.0         |
|   |                 |              |   | Religion Cornerstone course  | 2.0         | Religion Elective                                   | 2.0         |
|   |                 |              |   | <b>Total Hours</b>   | <b>15.5</b> | <b>Total Hours</b>                                  | <b>15.5</b> |
|   |                 |              |   | <u>2nd Semester</u>  |             |   |             |
|   |                 |              |   | American Heritage  | 3.0         | STAT 346  | 3.0         |
|   |                 |              |   | MATH 113 (FWSpSu)  | 4.0         | IS 520  | 3.0         |
|   |                 |              |   | STAT 274   | 3.0         | Civilization 2                                      | 3.0         |
|   |                 |              |   | STAT 240   | 3.0         | Biological Science                                  | 3.0         |
|   |                 |              |   | Religion Cornerstone course  | 2.0         | Religion Elective                                   | 2.0         |
|   |                 |              |   | <b>Total Hours</b>   | <b>15.0</b> | Open Elective                                       | 1.0         |
|   |                 |              |   |  |             | <b>Total Hours</b>                                  | <b>15.0</b> |
|   |                 |              |   | Dept. recommendation: Register for and pass Exam FM.   |             |   |             |
|   |                 |              |   | <b>SOPHOMORE YEAR</b>  |             |   |             |
|   |                 |              |   | <u>3rd Semester</u>  |             |   |             |
|   |                 |              |   | STAT 230   | 3.0         | <b>SENIOR YEAR</b>                                  |             |
|   |                 |              |   | STAT 250   | 3.0         | <u>7th Semester</u>                                 |             |
|   |                 |              |   | Physical Science   | 3.0         | STAT 348  | 3.0         |
|   |                 |              |   | Global and Cultural Awareness  | 3.0         | STAT 446  | 3.0         |
|   |                 |              |   | Religion Cornerstone course  | 2.0         | Requirement 7 Elective #1                           | 3.0         |
|   |                 |              |   | <b>Total Hours</b>   | <b>14.0</b> | Religion Elective                                   | 2.0         |
|   |                 |              |   |  |             | Open Elective                                       | 4.0         |
|   |                 |              |   | <u>4th Semester</u>  |             | <b>Total Hours</b>                                  | <b>15.0</b> |
|   |                 |              |   | MATH 213   | 2.0         | <b>8th Semester</b>                                 |             |
|   |                 |              |   | MATH 215   | 1.0         | Requirement 7 Elective #2                           | 3.0         |
|   |                 |              |   | STAT 340   | 3.0         | STAT 444 (will count for Requirement 7 Elective #3) | 3.0         |
|   |                 |              |   | Letters  | 3.0         | Arts  | 3.0         |
|   |                 |              |   | Religion Cornerstone course  | 2.0         | Open Electives                                      | 6.0         |
|   |                 |              |   | Open Electives   | 4.0         | <b>Total Hours</b>                                  | <b>15.0</b> |
|   |                 |              |   | <b>Total Hours</b>   | <b>15.0</b> |   |             |
|   |                 |              |   | Department recommendation: Register for and pass Exam P. Internship during Spring/Summer. Much of the hiring occurs the previous fall.   |             |   |             |
|   |                 |              |   | 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.  |             |   |             |

### Program Requirements

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 - Intro to Statistics Department 0.5

STAT 274 - Theory of Interest 3.0

#### Requirement 2 —Complete 5 Courses

Statistics core courses:

STAT 230 - Analysis of Variance 3.0

STAT 240 - Probability and Inference 1 3.0

STAT 250 - Applied R Programming 3.0

STAT 330 - Statistical Modeling 2 3.0

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 hours

Recommended course: Actuarial science majors should take IS 520, but all of the courses are valuable.

CS 110 - How to Program 3.0

CS 111 - Intro to Computer Science 3.0

HLTH 440 - Statistical Computing in Epi 3.0

IS 520 - Spreadsheet Automation 3.0

STAT 286 - Data Science Ecosystems 3.0

#### Requirement 5 —Complete 3 Courses

STAT 344 - Long-term Actuarial Math 3.0

STAT 346 - Short-term Actuarial Math 3.0

STAT 348 - Stat for Risk Modeling 3.0

#### Requirement 6 —Complete 3 hours

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 - Adv Long-term Act Math 3.0

STAT 446 - Adv Short-term Act Math 3.0

#### Requirement 7 —Complete 9 hours

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 - Econ Principles & Problems 3.0

FIN 201 - Principles of Finance 3.0

IS 515 - Spreadsheets for Bus Analysis 3.0

IS 520 - Spreadsheet Automation 3.0

STAT 234 - Methods of Survey Sampling 3.0

STAT 251 - Intro to Bayesian Statistics 3.0

STAT 281 - Data Visualization 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 Stat - You may take up to 3.0 credit hours 1.0v

STAT 435 - Nonparametric Stat Methods 3.0

STAT 437 - Applications in Biostatistics 3.0

STAT 444 - Adv Long-term Act Math 3.0

STAT 446 - Adv Short-term Act Math 3.0

STAT 451 - Applied Bayesian Statistics 3.0

STAT 466 - Intro 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 - You may take up to 3.0 credit hours 1.0v

STAT 496R - Academic Internship - You may take up to 3.0 credit hours 0.5v

STAT 497R - Intro to Research - You may take up to 3.0 credit hours 0.5v

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:

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.

### DEPARTMENT INFORMATION

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FACULTY ADVISOR:

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### ADVISEMENT CENTER INFORMATION

Physical and Mathematical Sciences College Advisement Center

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Telephone: (801) 422-2674

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