BS in Actuarial Science (695224) MAP Sheet
Physical and Mathematical Sciences, Statistics
For students entering the degree program during the 2018-2019 curricular year.

### University Core and Graduation Requirements

#### University Core Requirements:

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Classes</th>
<th>Hours</th>
<th>Classes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Religion Cornerstones</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teachings and Doctrine of The Book of Mormon</td>
<td>1</td>
<td>2.0</td>
<td>REL A 275</td>
</tr>
<tr>
<td>Jesus Christ and the Everlasting Gospel</td>
<td>1</td>
<td>2.0</td>
<td>REL A 250</td>
</tr>
<tr>
<td>Foundations of the Restoration</td>
<td>1</td>
<td>2.0</td>
<td>REL C 225</td>
</tr>
<tr>
<td>The Eternal Family</td>
<td>1</td>
<td>2.0</td>
<td>REL C 200</td>
</tr>
<tr>
<td><strong>The Individual and Society</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>American Heritage</td>
<td>1-2</td>
<td>3-6.0</td>
<td>from approved list</td>
</tr>
<tr>
<td>Global and Cultural Awareness</td>
<td>1</td>
<td>3.0</td>
<td>from approved list</td>
</tr>
<tr>
<td><strong>Skills</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First Year Writing</td>
<td>1</td>
<td>3.0</td>
<td>from approved list</td>
</tr>
<tr>
<td>Advanced Written and Oral Communications</td>
<td>1</td>
<td>3.0</td>
<td>from approved list</td>
</tr>
<tr>
<td>Quantitative Reasoning</td>
<td>1</td>
<td>4.0</td>
<td>MATH 112*</td>
</tr>
<tr>
<td>Languages of Learning (Math or Language)</td>
<td>1</td>
<td>4.0</td>
<td>MATH 112*</td>
</tr>
<tr>
<td><strong>Arts, Letters, and Sciences</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Civilization 1</td>
<td>1</td>
<td>3.0</td>
<td>from approved list</td>
</tr>
<tr>
<td>Civilization 2</td>
<td>1</td>
<td>3.0</td>
<td>from approved list</td>
</tr>
<tr>
<td>Arts</td>
<td>1</td>
<td>3.0</td>
<td>from approved list</td>
</tr>
<tr>
<td>Letters</td>
<td>1</td>
<td>3.0</td>
<td>from approved list</td>
</tr>
<tr>
<td>Biological Science</td>
<td>1</td>
<td>3-4.0</td>
<td>from approved list</td>
</tr>
<tr>
<td>Physical Science</td>
<td>1</td>
<td>3.0</td>
<td>from approved list</td>
</tr>
<tr>
<td>Social Science</td>
<td>1</td>
<td>3.0</td>
<td>from approved list</td>
</tr>
<tr>
<td><strong>Core Enrichment: Electives</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Religion Electives</td>
<td>3-4</td>
<td>6.0</td>
<td>from approved list</td>
</tr>
<tr>
<td>Open Electives</td>
<td>Variable</td>
<td>Variable</td>
<td>personal choice</td>
</tr>
<tr>
<td><strong>Graduation Requirements:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimum residence hours</td>
<td>30.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimum hours needed to graduate</td>
<td>120.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

### Suggested Sequence of Courses

#### Freshman Year

<table>
<thead>
<tr>
<th>1st Semester</th>
<th>2nd Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year Writing</td>
<td>3.0</td>
</tr>
<tr>
<td>Social Science</td>
<td>3.0</td>
</tr>
<tr>
<td>MATH 112 (FWSpSu)</td>
<td>4.0</td>
</tr>
<tr>
<td>STAT 121</td>
<td>3.0</td>
</tr>
<tr>
<td>Religion Cornerstone course</td>
<td>2.0</td>
</tr>
<tr>
<td><strong>Total Hours</strong></td>
<td><strong>15.0</strong></td>
</tr>
</tbody>
</table>

#### Sophomore Year

<table>
<thead>
<tr>
<th>3rd Semester</th>
<th>4th Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>American Heritage</td>
<td>3.0</td>
</tr>
<tr>
<td>MATH 113 (FWSpSu)</td>
<td>4.0</td>
</tr>
<tr>
<td>STAT 274</td>
<td>3.0</td>
</tr>
<tr>
<td>STAT 240</td>
<td>3.0</td>
</tr>
<tr>
<td>Religion Cornerstone course</td>
<td>2.0</td>
</tr>
<tr>
<td><strong>Total Hours</strong></td>
<td><strong>15.0</strong></td>
</tr>
</tbody>
</table>

Department recommendation: Register for and pass Exam FM.

#### Junior Year

<table>
<thead>
<tr>
<th>5th Semester</th>
<th>6th Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Requirement 5 elective #1</td>
<td>3.0</td>
</tr>
<tr>
<td>Requirement 5 elective #2</td>
<td>3.0</td>
</tr>
<tr>
<td>Arts</td>
<td>3.0</td>
</tr>
<tr>
<td>General Electives</td>
<td>6.0</td>
</tr>
<tr>
<td><strong>Total Hours</strong></td>
<td><strong>15.0</strong></td>
</tr>
</tbody>
</table>

Department recommendation: Internship during Spring/Summer.

#### Senior Year

<table>
<thead>
<tr>
<th>7th Semester</th>
<th>8th Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Requirement 5 elective #3</td>
<td>3.0</td>
</tr>
<tr>
<td>General Electives</td>
<td>9.0</td>
</tr>
<tr>
<td><strong>Total Hours</strong></td>
<td><strong>15.0</strong></td>
</tr>
</tbody>
</table>

Department recommendation: Internship during Spring/Summer.

Note 1: 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 2: Students are encouraged to complete an average of 15 credit hours each semester or 30 credit hours each year, which could include spring and/or summer terms. Taking fewer credits substantially increases the cost and the number of semesters to graduate.
Students must pass one exam of the Society of Actuaries (SOA), usually Exam FM, before declaring an actuarial science major.

No more than 3 hours of credit below C- is allowed in major courses.

**REQUIREMENT 1** Complete 2 courses
- STAT 121 - Principles of Statistics 3.0
- STAT 274 - Theory of Interest 3.0

**REQUIREMENT 2** Complete 2 courses
- PREPARATION CORE COURSES:
  - *MATH 112 - Calculus 1 4.0
  - MATH 113 - Calculus 2 4.0

**REQUIREMENT 3** Complete 8 courses
- STATISTICS CORE COURSES:
  - STAT 123 - Introduction to R Programming 1.5
  - STAT 124 - SAS Base Programming Skills 1.5
  - STAT 223 - Applied R Programming 1.5
  - STAT 224 - Applied SAS Programming 1.5
  - STAT 230 - Analysis of Variance 3.0
  - STAT 240 - Probability and Inference 1 3.0
  - STAT 330 - Introduction to Regression 3.0
  - STAT 340 - Probability and Inference 2 3.0

**REQUIREMENT 4** Complete 6.0 hours from the following course(s)
- INTERESTED IN LIFE INSURANCE OR INVESTMENTS SHOULD TAKE AT LEAST 377 AND 475 AND THOSE INTERESTED IN HEALTH AND PROPERTY/CASUALTY INSURANCE SHOULD TAKE AT LEAST 477 AND 47T AND 47T.
  - STAT 377 - Statistical Models for Financial Economics 3.0
  - STAT 475 - Life Contingencies 3.0
  - STAT 477 - Statistical Distributions for Actuarial Modeling and Data Analy 3.0

**REQUIREMENT 5** Complete 9.0 hours from the following course(s)
- ACC 200 - Principles of Accounting 3.0
- ECON 110 - Economic Principles and Problems 3.0
- ECON 380 - Intermediate Price Theory 1 3.0
- ECON 381 - Intermediate Macroeconomics 3.0
- ECON 382 - Intermediate Price Theory 2 3.0
- ECON 388 - Introduction to Econometrics 3.0
- ECON 450 - Financial Economics 3.0
- ECON 588 - Advanced Econometrics 3.0
- STAT 224 - Applied SAS Programming 1.5
- STAT 230 - Analysis of Variance 3.0
- STAT 240 - Probability and Inference 1 3.0
- STAT 330 - Introduction to Regression 3.0
- STAT 340 - Probability and Inference 2 3.0
- STAT 400 - Principles of Finance 3.0
- IS 515 - Spreadsheets for Business Analysis 3.0
- IS 520 - Business Programming and Spreadsheet Automation 3.0
- STAT 125 - Introduction to Operating Systems, UNIX, and Shell Programs 1.5
- STAT 126 - Introduction to Python Programming 1.5
- STAT 226 - SQL 1.5
- STAT 234 - Methods of Survey Sampling 3.0
- STAT 251 - Introduction to Bayesian Statistics 3.0
- STAT 377 - Statistical Models for Financial Economics 3.0
- STAT 381 - Statistical Computing 3.0
- STAT 420 - Big Data Science 1 3.0
- STAT 421 - Big Data Science 2 3.0
- STAT 435 - Nonparametric Statistical Methods 3.0
- STAT 451 - Applied Bayesian Statistics 3.0
- STAT 462 - Quality Control and Industrial Statistics 3.0
- STAT 466 - Introduction to Reliability 3.0
- STAT 469 - Applied Time Series and Forecasting 3.0
- STAT 475 - Life Contingencies 3.0
- STAT 477 - Statistical Distributions for Actuarial Modeling and Data Analysis 3.0
- STAT 495R - Special Topics in Statistics 3.0

You may take up to 3 credit hours.

- STAT 496R - Academic Internship: Statistics 3.0
- STAT 497R - Introduction to Statistical Research 3.0
- STAT 531 - Experimental Design 3.0

**Note:** If all 3 courses are taken in Requirement 4, one can be used as an elective. While it is best to take all three, students interested in life insurance or investments should take at least STAT 377 and 475, and those interested in health and property/casualty insurance should take at least STAT 477 and 47T and 47T.

**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 three 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: enterprise risk management, quantitative finance and investment, life insurance, health insurance, and retirement benefits. By focusing on the development of data analysis skills, actuaries can 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; virtually all 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 five exams offered by the Society of Actuaries and 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:

- Exam P: Stat 240, 340, 372 (full coverage)
- Exam FM: Stat 274 (full coverage)
- Exam MFE: Stat 377 (about 90% coverage)
- Exam C: Stat 240, 340, 372 (full coverage)
- Exam MLC: Stat 475 (about 50% coverage)
- Exam MFE: Stat 377 (about 90% coverage)
- Exam C: Stat 240, 340, 477 (about 90% coverage)

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

- Applied Statistical Methods VEE:
  - STAT 435 - Nonparametric Statistical Methods 3.0
  - STAT 451 - Applied Bayesian Statistics 3.0
  - STAT 462 - Quality Control and Industrial Statistics 3.0
  - STAT 466 - Introduction to Reliability 3.0
  - STAT 469 - Applied Time Series and Forecasting 3.0
  - STAT 475 - Life Contingencies 3.0
  - STAT 477 - Statistical Distributions for Actuarial Modeling and Data Analysis 3.0
  - STAT 495R - Special Topics in Statistics 3.0

**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:**
**BS in Actuarial Science (695224)**
**2018-2019**

| Stat 330 (has Stat 230 prereq.) | FACULTY ADVISOR:  
Del T. Scott  
223C TMCB  
Brigham Young University, Provo, UT 84602  
Telephone: (801) 422-7054 |
|-----------------------------|--------------------------------------------------|
| Corp Finance VEE: Fin 201   | **ADVICEMENT CENTER INFORMATION**  
Physical and Mathematical Sciences College Advisement Center  
Brigham Young University  
N-181 ESC  
Provo, UT 84602  
Telephone: (801) 422-2674 |
| Economics VEE: Econ 110     |  
**SAS CERTIFICATION EXAMS:**  
SAS Certified Base Programmer and SAS Certified Advanced Programmer. Students can take the SAS Certification exams after completing Stat 124 and 224. Information and exam registration is available at  
SAS/BYU Applied Statistics and Advanced SAS Programming Certificate. Students who earn a B or higher in the applied and computing core classes (Stat 124, 224, 230, 330, 381) are eligible to receive a certificate jointly issued by SAS and BYU which can be listed on a resume. More information is available at  
http://statistics.byu.edu/content/sas-certificate-opportunities.  
**INTERNSHIPS:**  
The department maintains a list of companies that have hired BYU Actuarial Science students as interns in the last three years. This list is found at http://statistics.byu.edu/content/actuarial-company-database.  
**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**  
Department of Statistics  
Brigham Young University  
223 TMCB  
Provo, UT 84602  
Telephone: (801) 422-4505  
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**SAS CERTIFICATION EXAMS:**  
SAS Certified Base Programmer and SAS Certified Advanced Programmer. Students can take the SAS Certification exams after completing Stat 124 and 224. Information and exam registration is available at  
SAS/BYU Applied Statistics and Advanced SAS Programming Certificate. Students who earn a B or higher in the applied and computing core classes (Stat 124, 224, 230, 330, 381) are eligible to receive a certificate jointly issued by SAS and BYU which can be listed on a resume. More information is available at  
http://statistics.byu.edu/content/sas-certificate-opportunities.  
**ADVICEMENT CENTER INFORMATION**  
Physical and Mathematical Sciences College Advisement Center  
Brigham Young University  
N-181 ESC  
Provo, UT 84602  
Telephone: (801) 422-2674  
**DEPARTMENT INFORMATION**  
Department of Statistics  
Brigham Young University  
223 TMCB  
Provo, UT 84602  
Telephone: (801) 422-4505