BS in Statistics: Biostatistics (695233) MAP Sheet
Physical and Mathematical Sciences, Statistics
For students entering the degree program during the 2020-2021 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>Religion Cornerstones</td>
<td>1</td>
<td>2.0</td>
<td>REL A 275</td>
</tr>
<tr>
<td>Teachings and Doctrine of The Book of Mormon</td>
<td>1</td>
<td>2.0</td>
<td>REL A 250</td>
</tr>
<tr>
<td>Jesus Christ and the Everlasting Gospel</td>
<td>1</td>
<td>2.0</td>
<td>REL C 225</td>
</tr>
<tr>
<td>Foundations of the Restoration</td>
<td>1</td>
<td>2.0</td>
<td>REL C 200</td>
</tr>
<tr>
<td>The Eternal Family</td>
<td>1</td>
<td>2.0</td>
<td>REL C 200</td>
</tr>
</tbody>
</table>

**The Individual and Society**

| American Heritage             | 1-2      | 3-6.0 | 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         | 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        | 3.0   | PDBIO 120* recommended |
| Physical Science              | 1-2      | 3-7.0 | 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 (9 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
- MATH 112* (FWSpSu) 4.0
- STAT 121 3.0
- STAT 130 0.5
- Biological Science 3.0
- Religion Cornerstone course 2.0
- General electives 1.0
- Total Hours 16.5

**2nd Semester**

- American Heritage 3.0
- MATH 113 (FWSpSu) 4.0
- STAT 230 3.0
- Religion Cornerstone course 2.0
- Physical Science 3.0
- Total Hours 15.0

#### SOPHOMORE YEAR

**3rd Semester**

- MATH 213 2.0
- MATH 215 1.0
- STAT 240 3.0
- Global and Cultural Awareness 3.0
- Civilization 1 3.0
- Religion Cornerstone course 2.0
- General electives 1.0
- Total Hours 15.0

**4th Semester**

- American Heritage 3.0
- MATH 314 (FWSpSu) 3.0
- STAT 123 1.5
- STAT 223 1.5
- STAT 330 3.0
- Religion Cornerstone course 2.0
- Civilization 2 3.0
- Total Hours 14.0

#### JUNIOR YEAR

**5th Semester**

- Requirement 7 Elective 3.0
- Requirement 4 Elective #1 1.5
- Requirement 4 Elective #2 1.5
- STAT 340 3.0
- Advanced Written and Oral Communication 3.0
- Religion elective 2.0
- General Elective 2.0
- Total Hours 16.0

**6th Semester**

- Requirement 8 Elective 3.0
- Letters 3.0
- Religion elective 2.0
- General electives 4.0
- Total Hours 15.0

**SENIOR YEAR**

**7th Semester**

- Requirement 9 Elective 3.0
- Requirement 6 Elective 3.0
- Arts 3.0
- Religion Elective 3.0
- General Electives 6.0
- Total Hours 15.0

**8th Semester**

- Requirement 8 Elective 3.0
- Social Science 3.0
- General electives 12.0
- Total Hours 18.0

Note 1: Students should take STAT 130 the semester he/she declares himself/herself 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, which could include spring and/or summer terms. Taking fewer credits substantially increases the cost and the number of semesters to graduate.
Note 4: Students must have the statistics core completed before their senior year in order to graduate within four years.
Note 5: STAT 538 from Requirement 6 isn’t taught every year.
BS in Statistics: Biostatistics (695233)
2020-2021 Program Requirements (50.5 Credit Hours)

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

**REQUIREMENT 1** Complete 2 courses
- STAT 130 - Introduction to the Department of Statistics
- MATH 113 - Calculus 1

**REQUIREMENT 2** Complete 2 courses
- STAT 121 - Principles of Statistics
- MATH 112 - Calculus 1

**PREPARATION CORE COURSES:**
- STAT 226 - Applied R Programming
- STAT 224 - Applied SAS Programming
- STAT 340 - Probability and Inference 1
- STAT 341 - Probability and Inference 2
- STAT 228 - Introduction to Regression
- STAT 234 - Computational Linear Algebra
- STAT 239 - Calculus of Several Variables
- STAT 274 - Principles of Chemistry 1
- STAT 275 - Principles of Chemistry 2
- STAT 281 - Calculus 1
- STAT 282 - Calculus 2

**STATISTICS CORE COURSES:**
- STAT 126 - Introduction to Operating Systems, Linux/Unix, and Shell Prog
- STAT 223 - Introduction to R Programming
- STAT 341 - Principles of Calculus
- STAT 342 - Probability and Inference 2

**OPTION 1.1** Complete 1 course
- CHEM 105 - General College Chemistry 1

**OPTION 1.2** Complete 3 courses
- STAT 226 - Applied R Programming
- STAT 224 - Applied SAS Programming
- STAT 228 - Introduction to Regression
- STAT 340 - Probability and Inference 1
- STAT 341 - Probability and Inference 2
- STAT 229 - Calculus of Several Variables
- STAT 274 - Principles of Chemistry 1
- STAT 275 - Principles of Chemistry 2
- STAT 281 - Calculus 1
- STAT 282 - Calculus 2

**OPTION 1.3** Complete 2 courses
- STAT 126 - Introduction to Operating Systems, Linux/Unix, and Shell Prog
- STAT 223 - Introduction to R Programming
- STAT 341 - Principles of Calculus
- STAT 342 - Probability and Inference 2
- STAT 228 - Introduction to Regression
- STAT 340 - Probability and Inference 1
- STAT 229 - Calculus of Several Variables
- STAT 274 - Principles of Chemistry 1
- STAT 275 - Principles of Chemistry 2
- STAT 281 - Calculus 1
- STAT 282 - Calculus 2

**OPTION 1.4** Complete 2 courses
- STAT 226 - Applied R Programming
- STAT 224 - Applied SAS Programming
- STAT 228 - Introduction to Regression
- STAT 340 - Probability and Inference 1
- STAT 341 - Probability and Inference 2
- STAT 229 - Calculus of Several Variables
- STAT 274 - Principles of Chemistry 1
- STAT 275 - Principles of Chemistry 2
- STAT 281 - Calculus 1
- STAT 282 - Calculus 2

**OPTION 1.5** Complete 2 courses
- STAT 126 - Introduction to Operating Systems, Linux/Unix, and Shell Prog
- STAT 223 - Introduction to R Programming
- STAT 341 - Principles of Calculus
- STAT 342 - Probability and Inference 2
- STAT 228 - Introduction to Regression
- STAT 340 - Probability and Inference 1
- STAT 229 - Calculus of Several Variables
- STAT 274 - Principles of Chemistry 1
- STAT 275 - Principles of Chemistry 2
- STAT 281 - Calculus 1
- STAT 282 - Calculus 2

**OPTION 1.6** Complete 1 course
- STAT 226 - Applied R Programming
- STAT 224 - Applied SAS Programming
- STAT 228 - Introduction to Regression
- STAT 340 - Probability and Inference 1
- STAT 341 - Probability and Inference 2
- STAT 229 - Calculus of Several Variables
- STAT 274 - Principles of Chemistry 1
- STAT 275 - Principles of Chemistry 2
- STAT 281 - Calculus 1
- STAT 282 - Calculus 2

**OPTION 2** Complete 3.0 hours from the following course(s)
- STAT 226 - Applied R Programming
- STAT 224 - Applied SAS Programming
- STAT 228 - Introduction to Regression
- STAT 340 - Probability and Inference 1
- STAT 341 - Probability and Inference 2
- STAT 229 - Calculus of Several Variables
- STAT 274 - Principles of Chemistry 1
- STAT 275 - Principles of Chemistry 2
- STAT 281 - Calculus 1
- STAT 282 - Calculus 2

**REQUIREMENT 3** Complete 6 courses
- STAT 274 - Theory of Interest
- STAT 377 - Statistical Models for Financial Economics
- STAT 381 - Statistical Computing
- STAT 421 - Big Data Science 2
- STAT 426 - Data Science Methods and Applications in Statistics
- STAT 455 - Nonparametric Statistical Methods
- STAT 466 - Big Data Science 1
- STAT 472 - Theory of Interest
- STAT 475 - Statistical Models for Financial Economics
- STAT 481 - Statistical Computing
- STAT 497R - Introduction to Statistical Research
- STAT 498 - Course in Biostatistics
- STAT 499R - Special Topics in Statistics
- STAT 999 - Academic Internship: Statistics

**REQUIREMENT 4** Complete 3.0 hours from the following course(s)
- STAT 24 - SAS Base Programming Skills
- STAT 126 - Introduction to Operating Systems, Linux/Unix, and Shell Prog
- STAT 223 - Introduction to R Programming
- STAT 224 - Applied SAS Programming
- STAT 228 - Introduction to Regression
- STAT 340 - Probability and Inference 1
- STAT 341 - Probability and Inference 2
- STAT 229 - Calculus of Several Variables
- STAT 274 - Principles of Chemistry 1
- STAT 275 - Principles of Chemistry 2
- STAT 281 - Calculus 1
- STAT 282 - Calculus 2

**REQUIREMENT 5** Complete 2 courses
- STAT 426 - Data Science Methods and Applications in Statistics
- STAT 435 - Nonparametric Statistical Methods
- STAT 441 - Applied Bayesian Statistics
- STAT 445 - Applied Bayesian Statistics
- STAT 446 - Introduction to Reliability
- STAT 449 - Analysis of Correlated Data
- STAT 458 - Survival Analysis

**REQUIREMENT 6** Complete 3.0 hours from the following course(s)
- STAT 437 - Applications in Biostatistics
- STAT 538 - Survival Analysis

**REQUIREMENT 7** Complete 3.0 hours from the following course(s)
- STAT 538 - Survival Analysis
- STAT 541 - Applied Bayesian Statistics
- STAT 445 - Applied Bayesian Statistics
- STAT 446 - Introduction to Reliability
- STAT 449 - Analysis of Correlated Data
- STAT 458 - Survival Analysis

**REQUIREMENT 8** Complete 3.0 hours from the following course(s)
- STAT 226 - Applied R Programming
- STAT 224 - Applied SAS Programming
- STAT 228 - Introduction to Regression
- STAT 340 - Probability and Inference 1
- STAT 341 - Probability and Inference 2
- STAT 229 - Calculus of Several Variables
- STAT 274 - Principles of Chemistry 1
- STAT 275 - Principles of Chemistry 2
- STAT 281 - Calculus 1
- STAT 282 - Calculus 2

**REQUIREMENT 9** Complete 3.0 hours from the following course(s)
- STAT 226 - Applied R Programming
- STAT 224 - Applied SAS Programming
- STAT 228 - Introduction to Regression
- STAT 340 - Probability and Inference 1
- STAT 341 - Probability and Inference 2
- STAT 229 - Calculus of Several Variables
- STAT 274 - Principles of Chemistry 1
- STAT 275 - Principles of Chemistry 2
- STAT 281 - Calculus 1
- STAT 282 - Calculus 2

**THE DISCIPLINE:**

Statisticians apply sophisticated methods to increasingly massive data sets to discover insights into important business, government, and health policy questions. The curriculum and degrees offered through the Department of Statistics are designed to equip students with decision-making skills for careers as professional statisticians in industrial organizations, government agencies, insurance companies, pharmaceutical companies, universities, and research institutes.

**C S 142 - Introduction to Computer Programming**

**C S 143 - Introduction to Computer Programming**

**C S 142 - Introduction to Computer Programming**

**C S 143 - Introduction to Computer Programming**
The Biostatistics emphasis prepares students to engage in work to advance public health, biology, and medicine. It prepares students for graduate programs in statistics, biostatistics, epidemiology, public health, bioinformatics, and for health sciences professional programs. The Biostatistics emphasis includes the mathematics courses required for graduate study in statistics and biostatistics together with a selection of biology and chemistry courses.

**CAREER OPPORTUNITIES:**
The increase of big data and analytics in personalized medicine, genomics, and bioinformatics is creating new challenges and opportunities for biostatisticians. Students with undergraduate degrees in biostatistics are well-prepared to apply for graduate programs in statistics and biostatistics but they also stand out as applicants to medical and dental schools and residencies. Statistical training prepares these students to take part in basic and clinical research during medical or dental school and residency.

**CERTIFICATION:**
- **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 support.sas.com/certify/creds/index.html.
- **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 https://statistics.byu.edu/content/sas-certificate-opportunities.

**INTERNSHIPS:**
- **Internships.** The National Institutes of Health support a Summer Institute for Training in Biostatistics at nine university biostatistics programs. Program/application information is found at https://www.nhbi.nih.gov/node-general/summer-institute-biostatistics.