**B.S. Degree – Data Analytics Major**
**Degree Requirements**

**Social Science Analytics**
**Specialization**

The program requirements for the Bachelor of Science degree with a major in Data Analytics and a specialization in **Social Science Analytics** are given below. A minimum of 134 total degree hours are required for graduation.

The Required Core courses follow a strict prerequisite structure. Some courses are only offered once per year. Failure to successfully enroll in and complete these courses *will* delay graduation.

## Data Analytics Major Requirements

| Course Number | Course Title | Credit Hours | Terms Offered |
|---|---|---|---|
| **Prerequisites** | | | |
| CSE 1223 or 1224 [a] | Intro to Computer Programming in Java or Python | 3 | AU/SP/SU |
| **Math 1152** [b] | Calculus II | 5 | AU/SP/SU |
| **Required Core** | | | |
| Math 2568 | Linear Algebra | 3 | AU/SP/SU |
| ISE 3230 | Systems Modeling and Optimization | 3 | AU |
| **CSE 2221** [b] | Software I: Software Components | 4 | AU/SP/SU |
| CSE 2231 | Software II: Development and Design | 4 | AU/SP/SU |
| CSE 2321 | Foundations I: Discrete Structures | 3 | AU/SP/SU |
| CSE 2421 or 3430 | Systems I: Computer Systems and Organization | 4 | AU/SP/SU |
| CSE 3241 | Databases I: Computer Architecture | 3 | AU/SP/SU |
| CSE 3244 or 5242 | Data Management in the Cloud or Advanced Database Systems | 3 | AU/SP |
| CSE 5243 | Data Mining | 3 | AU/SP |
| CSE 5544 or ISE 5760 | Data Visualization | 3 | AU/SP |
| STAT 3201 | Probability for Data Analytics | 3 | AU/SP |
| STAT 3202 | Statistical Inference for Data Analytics | 4 | AU/SP/SU |
| STAT 3301 | Statistical Modeling for Discovery I | 3 | AU |
| STAT 3302 | Statistical Modeling for Discovery II | 3 | SP |
| STAT 4620 | Statistical Learning | 2 | AU |
| STAT 3303 | Statistical Decision Making | 3 | SP |
| TOTAL | | 51 | |

[a] CSE 1222 or CSE placement level A can also fulfill this prerequisite; however, 1223 or 1224 is *strongly preferred*.

[b] Math 1152 and CSE 2221 must be completed before applying to the Data Analytics major program.

## Social Science Analytics Specialization

| | | | |
|---|---|---|---|
| Overview of Research Methods | Choose one course from list below | 3 | AU/SP |
| Electives | Choose 9 credit hours from list below | 9 | AU/SP/SU |
| STAT 4911 | Capstone in Data Analytics | 4 | SP |
| DEPT 4998/4999[c] | Independent Research in the Social Sciences | 3 | AU/SP/SU |
| TOTAL | | 19 | |

[c] Students pursuing the Social Science Analytics specialization are required to complete an independent research project of their choosing under the guidance of a faculty member. You are encouraged to meet with a Data Analytics advisor early in your third year to discuss options for fulfilling this requirement. A syllabus for this project is linked here: Social Science Analytics Research Syllabus.pdf.

| **OVERVIEW OF RESEARCH METHODS** | | | |
|---|---|---|---|
| **COURSE** | **TITLE** | **HOURS** | **PREREQUISITES** |
| Choose **one** of the following: | | | |
| COMM 3160 | Communications Research Methods | 4 | STAT 1450 or higher |
| POLISCI 4781 | Data Analysis in Political Science | 3 | MATH 1151 and one POLISCI course at 3000-level or higher |
| PSYCH 2300 | Research Methods in Psychology | 3 | PSYCH 1100 or 1100H |
| SOCIOL 3487 | Research Methods in Sociology | 3 | None |

| **ELECTIVES: FOCUSED RESEARCH METHODS AND VISUALIZATION AND SPATIAL ANALYSES** | | | |
|---|---|---|---|
| **COURSE** | **TITLE** | **HOURS** | **PREREQUISITES** |
| Choose **three** of the following: | | | |
| ANTHRO 5650 | Research Design and Ethnographic Methods | 3 | ANTHROP 2202 |
| ANTHRO 5651 | Spatial Analysis for Anthropologists | 3 | GEOG 5210 |
| COMM 3163 | Communication Industry Research Methods | 4 | STAT 1450 or higher |
| ECON 4050 | Experimental Economics | 3 | ECON 2001.xx or equiv. |
| ECON 5410 | Econometrics I | 3 | ECON 4001.xx and STAT 2450 or higher |
| ECON 5420 | Econometrics II | 3 | ECON 5410 and 4002.xx |
| GEOG 5200 | Cartography and Map Design | 3 | None |
| GEOG 5201 | GeoVisualization | 3 | GEOG 5200 |
| GEOG 5210 | Fundamentals of Geographic Information Systems | 3 | None |
| GEOG 5222 | GIS Algorithms & Programming | 3 | GEOG 5210 and 5212 and CSE 1114 |
| GEOG 5223 | Design & Implementation of GIS | 3 | GEOG 5222 |
| GEOG 5225 | Geographic Applications of Remote Sensing | 3 | None |
| GEOG 5226 | Spatial Simulation and Modeling | 3 | None |
| POLISCI 3780 | Data Literacy and Data Visualization | 3 | None |
| PSYCH 4511 | Psychological Testing | 3 | PSYCH 2220 and 2300 |

## General Education and College of Arts & Sciences Requirements

Students must satisfy the General Education requirements for the Bachelor of Science degree in the College of Arts and Sciences. Math 1151[d] is required for the major core curriculum; it is suggested that students use this course to satisfy the category indicated in the table below. Students in the Data Analytics major satisfy the GE's embedded literacy requirements by taking Stat 3301 (embedded literacy in data analysis) and Stat 3302 (embedded literacies in advanced writing and technology).

| GE Category [e] | Suggested Course | Category Credit Hours |
|---|---|---|
| Launch Seminar (GENED 1201) | | 1 |
| F: Writing and Information Literacy | | 3 |
| F: Mathematical and Quantitative Reasoning/Data Analysis | Math 1151[d] (5 cr. hrs.) | 3–5 |
| F: Literary, Visual and Performing Arts | | 3 |
| F: Historical and Cultural Studies | | 3 |
| F: Natural Science | | 4–5 |
| F: Social and Behavioral Sciences | | 3 |
| F: Race, Ethnicity, and Gender Diversity | | 3 |
| T: Citizenship for a Diverse and Just World | | 4–6 |
| T: Student Choice | | 4–6 |
| Reflection Seminar (GENED 4001) | | 1 |
| World Languages | | 12 |
| ARTSSCI 1100.xx Survey | | 1 |
| Minimum Total Credit Hours (w/Math 1151) | | 51 |

[d] Math 1151 may be replaced by Math 1140 and 1141.

[e] F: GE Foundations; T: GE Theme.

## Sample Four-Year Curriculum

This should be used as a **guide** only. Semester offerings are subject to change. Students should meet with the Data Analytics academic advisor every semester to ensure an on-time graduation.

| Year | Autumn | | Spring | |
|---|---|---|---|---|
| | **Course** | **Hours** | **Course** | **Hours** |
| 1 | ASC 1100.10 | 1 | GENED 1201 | 1 |
| | MATH 1151/1141/1161/1181H | 5 | MATH 1152/2162/1172/2182H | 5 |
| | CSE 1223, 1224, or equiv | 3 | CSE 2221 | 4 |
| | GE World Language 1 | 4 | GE World Language 2 | 4 |
| | GE Writing and Info Literacy | 3 | GE Social and Behavioral Sciences | 3 |
| | | Total: 16 | | Total: 17 |
| 2 | CSE 2231 | 4 | MATH 2568 | 3 |
| | CSE 2321 | 3 | CSE 2421 or 3430 | 4 |
| | STAT 3201 | 3 | STAT 3202 | 4 |
| | GE World Language 3 | 4 | GE Natural Science | 4-5 |
| | GE Literary, Visual and Performing Arts | 3 | Elective | 1 |
| | | Total: 17 | | Total: 16-17 |
| 3 | ISE 3230 | 3 | CSE 3244 | 3 |
| | CSE 3241 | 3 | STAT 3302 | 3 |
| | STAT 3301 | 3 | Specialization Elective [g] | 3 |
| | Overview of Research Methods | 3 | Specialization Elective [g] | 3 |
| | GE Citizenship for a Diverse and Just World | 3 | GE Citizenship for a Diverse and Just World | 3 |
| | Elective | 2 | GE Thematic Pathway Choice [f] | 3 |
| | | Total: 17 | | Total: 18 |
| 4 | CSE 5243 | 3 | STAT 3303 | 3 |
| | STAT 4620 | 2 | CSE 5544 or ISE 5760 | 3 |
| | Specialization Elective [g] | 3 | GE Historical and Cultural Studies | 3 |
| | DEPT 4998/4999 Research | 3 | STAT 4911 Capstone | 4 |
| | GE Thematic Pathway Choice [f] | 3 | GENED 4001 | 1 |
| | GE Race, Ethnicity, and Gender Diversity | 3 | Elective | 2 |
| | | Total: 17 | | Total: 16 |

[f] The 4–6 GE Thematic Pathway Choice credit hours must be taken in the same theme.
[g] From approved list of major specialization elective courses.