

KU B.S. Data Science Requirements

The major in Data Science focuses on the core concepts in computer science and mathematics, allowing students to build a foundation. Students will gain an understanding of basic programming, database, data analytics, and mathematics concepts to create a foundation in data science. They will also learn how to apply these concepts to a specialization area. The proposed specialization areas are biology, geography, and mathematics (for a more general focus on data science).

Note that all students must achieve 120 undergraduate credits and a minimum 2.0 overall GPA to graduate. The final major GPA requirement for Computer Science is 2.25.

Required Computer Science Core Courses – 27 credits

CPSC 105 Introduction to Data Visualization (3 credits)
CPSC 123 Introduction to Scientific Programming *or* CPSC 135 Comp Sci I (3 credits)
CPSC 125 Discrete Math for CS I (3 credits)
CPSC 150 Ethical, Legal, and Professional Impacts of the Digital Age (3 credits)
CPSC 223 Advanced Scientific Programming (3 credits)
CPSC 256 SQL Programming (3 credits)
CPSC 356 Introduction to Database Management Systems (3 credits)
CPSC 458 Data Mining and Predictive Analytics I (3 credits)
CPSC 459 Introduction to Data Mining (3 credits)

Required Mathematics Courses – 6 credits

MATH 250 Applied Regression Analysis (3 credits)
MATH 304 Statistical Programming (3 credits) *or* MATH 325 Applied Time Series Analysis (3 credits)

Computer Science Electives – 6 credits

6 additional credits of CPSC courses numbered 125 or higher, not previously used for above requirements, excluding CPSC 280 and CPSC 380.

Specialization – 19 to 21 credits

Complete 19-21 credits in one of the following specializations in Biology, Geography, or Mathematics.

Biology Specialization – 19-21 credits

See Directed General Education for BIOL 104 and required MATH courses

BIOL 106 Intro to Zoology (4 credits) *or* BIOL 108 Intro to Botany (4 credits)
BIOL 120 Anatomy and Physiology I (4 credits) *or* BIOL 2xx/3xx (3 or 4 credits)
BIOL 122 Anatomy and Physiology II (4 credits) *or* BIOL 2xx/3xx (3 or 4 credits)
BIOL 216 Genetics (3 credits)
BIOL 255 Introduction to Bioinformatics (3 credits)
BIOL 270 Research Methods (3 credits) *or* BIOL 370 Research in Biology (3 credits) *or* BIOL 395 Honors Independent Study/Thesis (3 credits)

Geography Specialization – 21 credits

See Directed General Education for required MATH courses

GEOG 274 Introduction to GIS (3 credits)
GEOG 330 Cartography (3 credits)
GEOG 333 Advanced GIS (3 credits)
GEOG 347 Remote Sensing of the Environment (3 credits)
GEOG 375 Research Methods in Geography (3 credits)

GEOG 371 Independent Research (3 credits) *or* GEOG 394 Internship (3 credits)

GEOG 380 Senior Seminar (requires senior thesis) (3 credits)

Mathematics Specialization – 19 credits

See Directed General Education for MATH 181 and MATH 182

MATH 224 Foundations of Higher Mathematics *or* CPSC 225 Discrete Math for Computing II (3 credits)

MATH 260 Linear Algebra (3 credits)

MATH 283 Calculus III (4 credits)

MATH 301 Probability and Statistics I (3 credits)

MATH 302 Probability and Statistics II (3 credits)

MATH 380 Senior Sem in Math *or* MATH 390 Directed Reading/ Research in Math *or* MATH 490 Adv Directed Reading/ Research in Math *or* MATH 395 Honors IS/Thesis *or* MATH 398 Honors Research *or* CPSC 385 CS Sem *or* CPSC 372 IS/Project in CS (3 credits)

Directed General Education Courses

The following courses are required to fulfill the major requirements and are suggested to satisfy general education. Follow the specialization selected above.

Biology Track

BIOL 104 Principles of Biology – Category C1 (4 credits)

MATH 105 *or higher* – Category C2 (3-4 credits)

MATH 140 Applied Statistics *or* MATH 150 Intro to Biostatistics – Category C3 (3 credits)

Geography Track

MATH 105 *or higher* – Category C3 (3-4 credits)

MATH 140 Applied Statistics *or* MATH 150 Intro to Biostatistics – Category C3 (3 credits)

Mathematics Track

MATH 181 Calculus I – Category C2 (4 credits)

MATH 182 Calculus II – Category C3 (4 credits)

University Electives – 15 to 20 credits

Any course carrying university credit.

Program Plan Code: BS_DASC

Effective Date: Fall 2024

KU B.S. Data Science Checksheet

Student Name:

Student ID Number:

This checksheet provides a mechanism for students and advisors to keep track of a student's progress in the program. Please refer to the program requirements for more details regarding options.

Note that all students must achieve 120 undergraduate credits and a minimum 2.0 overall GPA to graduate. The GPA for major courses for Data Science is a minimum of 2.0.

Required Computer Science Core Courses – 27 credits

CPSC 105: Introduction to Data Visualization	3 credits	Grade:
CPSC 123: Introduction to Scientific Programming I or CPSC 135: Computer Science I	3 credits	Grade:
CPSC 125: Discrete Math for CS I	3 credits	Grade:
CPSC 150: Ethical, Legal, & Prof. Impacts of the Digital Age	3 credits	Grade:
CPSC 223: Advanced Scientific Programming	3 credits	Grade:
CPSC 256: SQL Programming	3 credits	Grade:
CPSC 356: Introduction to Database Management Systems	3 credits	Grade:
CPSC 458: Data Mining and Predictive Analytics I	3 credits	Grade:
CPSC 459: Introduction to Big Data	3 credits	Grade:
Total Credits	27 total credits	

Required Mathematics Courses – 6 credits

MATH 250: Applied Regression Analysis	3 credits	Grade:
MATH 304: Statistical Programming or MATH 325: Applied Time Series Analysis	3 credits	Grade:
Total Credits	6 total credits	

Computer Science Electives – 6 credits

6 additional credits of CPSC courses numbered 125 or higher, not previously used for above requirements, excluding CPSC 280 and CPSC 380.

Course 1:	3 credits	Grade:
Course 2:	3 credits	Grade:
Total Credits	6 total credits	

Specialization – 19 to 21 credits

Complete 19-21 credits in one of the following specializations in Biology, Geography, or Mathematics.

Biology Specialization

See Directed General Education for required MATH courses		
See Directed General Education for BIOL 104		
BIOL 106: Introduction to Zoology or BIOL 108: Intro to Botany	4 credits	Grade:
BIOL 120: Anatomy and Physiology I or BIOL 2XX/3XX	3 or 4 credits	Grade:
BIOL 122: Anatomy and Physiology II or BIOL 2XX/3XX	3 or 4 credits	Grade:
BIOL 216: Genetics	3 credits	Grade:
BIOL 255: Introduction to Bioinformatics	3 credits	Grade:
BIOL 270: Research Methods or BIOL 370: Research in Biology or BIOL 395: Honors Independent Study/Thesis	3 credits	Grade:
Total Credits	19-21 total credits	

Geography Specialization

<i>See Directed General Education for required MATH courses</i>		
GEOG 274: Introduction to GIS	3 credits	Grade:
GEOG 330: Cartography	3 credits	Grade:
GEOG 333: Advanced GIS	3 credits	Grade:
GEOG 347: Remote Sensing of the Environment	3 credits	Grade:
GEOG 375: Research Methods in Geography	3 credits	Grade:
GEOG 371: Independent Research or GEOG 394: Internship	3 credits	Grade:
GEOG 380: Senior Seminar (requires senior thesis)	3 credits	Grade:
Total Credits	21 total credits	

Mathematics Specialization

<i>See Directed General Education for MATH 181 and 182</i>		
MATH 224: Foundations of Higher Mathematics or CPSC 225: Discrete Math for Computing II	3 credits	Grade:
MATH 260: Linear Algebra I	3 credits	Grade:
MATH 283: Calculus III	4 credits	Grade:
MATH 301: Probability and Statistics I	3 credits	Grade:
MATH 302: Probability and Statistics II	3 credits	Grade:
MATH 380: Senior Sem in Math or MATH 390: Directed Reading/ Research in Math or MATH 490: Adv Directed Reading/ Research in Math or MATH 395: Honors IS/Thesis or MATH 398: Honors Research or CPSC 385: CS Sem or CPSC 372: IS / Project in CS	3 credits	Grade:
Total Credits	19 total credits	

Directed General Education Courses

The following courses are required to fulfill the major requirements and are suggested to satisfy general education. Follow the specialization selected above.

Biology Track

BIOL 104: Principles of Biology (Category C1)	4 credits	Grade:
MATH 105 or higher (Category C2)	3 or 4 credits	Grade:
MATH 140: Applied Stats or MATH 150 Intro to Biostatistics (Category C3)	3 credits	Grade:

Geography Track

MATH 105 or higher (Category C2)	3 or 4 credits	Grade:
MATH 140: Applied Stats or MATH 150 Intro to Biostatistics (Category C3)	3 credits	Grade:

Mathematics Track

MATH 181 Calculus I (Category C2)	4 credits	Grade:
MATH 182 Calculus II (Category C3)	4 credits	Grade:

University Elective Courses – 15 to 20 credits

Any course carrying university credit.

Course 1:	credits	Grade:
Course 2:	credits	Grade:
Course 3:	credits	Grade:
Course 4:	credits	Grade:
Course 5:	credits	Grade:
Course 6:	credits	Grade:
Course 7:	credits	Grade:
Total Credits	15-20 total credits	

Summary of Graduation Requirements

Total credits from major courses	58-60
Total credits from general education program	42-45
Total credits from university electives	15-20
Minimum total credits to graduate	120
Minimum overall GPA	2.0
Minimum GPA in major program	2.0
Comprehensive Exam (Capstone class)	PASS

Program Plan Code: BS_DASC

Effective Date: Fall 2024

KU B.S. Data Science 8-Semester Planner

Student Name:

Student ID Number:

Each semester listed below provides information including course categories, typical credit hours (CH.), and space to add specific course selections. This planner is only a suggested path. Consult with your program advisor regarding your unique plans and interests as you make choices about your schedule.

B.S. Data Science – Biology Track

First Semester Plan

Major	CPSC 105	3 CH.	Selection:
Major	CPSC 123 <i>or</i> CPSC 135	3 CH.	Selection:
Gen Ed	FYSM 100	3 CH.	Selection:
Gen Ed	Gen. Ed. Elective	3 CH.	Selection:
Gen Ed	Gen. Ed. Elective	3 CH.	Selection:
Total		15 CH.	

Second Semester Plan

Major	CPSC 125 <i>or</i> CPSC 223	3 CH.	Selection:
Major	CPSC 150	3 CH.	Selection:
Gen Ed	BIOL 104 (C1)	4 CH.	Selection:
Gen Ed	MATH 140 <i>or</i> MATH 150 (C3)	3 CH.	Selection:
Gen Ed	Gen. Ed. Elective	3 CH.	Selection:
Total		16 CH.	

Third Semester Plan

Major	CPSC 125 <i>or</i> CPSC 223	3 CH.	Selection:
Major	CPSC 256	3 CH.	Selection:
Major	MATH 250	3 CH.	Selection:
Major	BIOL 106 <i>or</i> BIOL 108	4 CH.	Selection:
Gen Ed	MATH 105 <i>or</i> higher (C2)	3 CH.	Selection:
Total		16 CH.	

Fourth Semester Plan

Major	CPSC 356	3 CH.	Selection:
Major	MATH 304 <i>or</i> MATH 325	3 CH.	Selection:
Major	BIOL 216	3 CH.	Selection:
Gen Ed	Gen. Ed. Elective	3 CH.	Selection:
Gen Ed	Gen. Ed. Elective	3 CH.	Selection:
Total		15 CH.	

Fifth Semester Plan

Major	CPSC Elective Course	3 CH.	Selection:
Major	BIOL 120 <i>or</i> BIOL 2xx/3xx	3 or 4 CH.	Selection:
Gen Ed	Gen. Ed. Elective	3 CH.	Selection:
Gen Ed	Gen. Ed. Elective	3 CH.	Selection:
Elective	University Elective	3 CH.	Selection:
Total		15-16 CH.	

Sixth Semester Plan

Major	CPSC 458 <i>or</i> CPSC 459	3 CH.	Selection:
Major	BIOL 122 <i>or</i> BIOL 2xx/3xx	3 or 4 CH.	Selection:
Gen Ed	Gen Ed Elective	3 CH.	Selection:
Elective	University Elective	3 CH.	Selection:
Elective	University Elective	3 CH.	Selection:
Total		15-16 CH.	

Seventh Semester Plan

Major	CPSC 458 <i>or</i> CPSC459	3 CH.	Selection:
Major	BIOL 255	3 CH.	Selection:
Gen Ed	Gen. Ed. Elective	3 CH.	Selection:
Elective	University Elective	3 CH.	Selection:
Elective	University Elective	3 CH.	Selection:
Total		15 CH.	

Eighth Semester Plan

Major	CPSC Elective Course	3 CH.	Selection:
Major	BIOL 270 <i>or</i> BIOL 370 <i>or</i> BIOL 395	3 CH.	Selection:
Gen Ed	Gen. Ed. Elective	3 CH.	Selection:
Elective	University Elective	3 CH.	Selection:
Total		12 CH.	

Program Plan Code: BS_DASC**Effective Date:** Fall 2024

B.S. Data Science – Geography Track

First Semester Plan

Major	CPSC 105	3 CH.	Selection:
Major	CPSC 123 <i>or</i> CPSC 135	3 CH.	Selection:
Gen Ed	FYSM 100	3 CH.	Selection:
Gen Ed	Gen. Ed. Elective	3 CH.	Selection:
Gen Ed	Gen. Ed. Elective	3 CH.	Selection:
Total		15 CH.	

Second Semester Plan

Major	CPSC 125 <i>or</i> CPSC 223	3 CH.	Selection:
Major	CPSC 150	3 CH.	Selection:
Major	GEOG 274	3 CH.	Selection:
Gen Ed	MATH 140 <i>or</i> MATH 150 (C3)	3 CH.	Selection:
Gen Ed	Gen. Ed. Elective	3 CH.	Selection:
Total		15 CH.	

Third Semester Plan

Major	CPSC 125 <i>or</i> CPSC 223	3 CH.	Selection:
Major	CPSC 256	3 CH.	Selection:
Major	GEOG 330	3 CH.	Selection:
Major	MATH 250	3 CH.	Selection:
Gen Ed	MATH 105 <i>or</i> higher (C2)	3 CH.	Selection:
Total		15 CH.	

Fourth Semester Plan

Major	CPSC 356	3 CH.	Selection:
Major	MATH 304 <i>or</i> MATH 325	3 CH.	Selection:
Major	GEOG 333	3 CH.	Selection:
Gen Ed	Gen. Ed. Elective	3 CH.	Selection:
Gen Ed	Gen. Ed. Elective	3 CH.	Selection:
Total		15 CH.	

Fifth Semester Plan

Major	CPSC Elective Course	3 CH.	Selection:
Gen Ed	Gen. Ed. Elective	3 CH.	Selection:
Gen Ed	Gen. Ed. Elective	3 CH.	Selection:
Gen Ed	Gen. Ed. Elective	3 CH.	Selection:
Elective	University Elective	3 CH.	Selection:
Total		15 CH.	

Sixth Semester Plan

Major	CPSC 458 <i>or</i> CPSC 459	3 CH.	Selection:
Major	GEOG 347	3 CH.	Selection:
Gen Ed	Gen Ed Elective	3 CH.	Selection:
Gen Ed	Gen Ed Elective	3 CH.	Selection:
Elective	University Elective	3 CH.	Selection:
Total		15 CH.	

Seventh Semester Plan

Major	CPSC 458 <i>or</i> CPSC459	3 CH.	Selection:
Major	GEOG 375	3 CH.	Selection:
Gen Ed	Gen. Ed. Elective	3 CH.	Selection:
Elective	University Elective	3 CH.	Selection:
Elective	University Elective	3 CH.	Selection:
Total		15 CH.	

Eighth Semester Plan

Major	CPSC Elective Course	3 CH.	Selection:
Major	GEOG 371 <i>or</i> GEOG 394	3 CH.	Selection:
Major	GEOG 380	3 CH.	Selection:
Elective	University Elective	3 CH.	Selection:
Elective	University Elective	3 CH.	Selection:
Total		15 CH.	

Program Plan Code: BS_DASC

Effective Date: Fall 2024

B.S. Data Science – Mathematics Track

First Semester Plan

Major	CPSC 105	3 CH.	Selection:
Major	CPSC 123 <i>or</i> CPSC 135	3 CH.	Selection:
Gen Ed	FYSM 100	3 CH.	Selection:
Gen Ed	MATH 181 Calculus I (C2)	4 CH.	Selection:
Gen Ed	Gen. Ed. Elective	3 CH.	Selection:
Total		16 CH.	

Second Semester Plan

Major	CPSC 223	3 CH.	Selection:
Major	CPSC 150	3 CH.	Selection:
Major	CPSC 125	3 CH.	Selection:
Gen Ed	MATH 182 Calculus II (C3)	4 CH.	Selection:
Gen Ed	Gen. Ed. Elective	3 CH.	Selection:
Total		16 CH.	

Third Semester Plan

Major	MATH 283	4 CH.	Selection:
Major	CPSC 256	3 CH.	Selection:
Major	MATH 224 <i>or</i> CPSC 225	3 CH.	Selection:
Gen Ed	Gen. Ed. Elective	3 CH.	Selection:
Elective	University Elective	3 CH.	Selection:
Total		16 CH.	

Fourth Semester Plan

Major	CPSC 356	3 CH.	Selection:
Major	MATH 301	3 CH.	Selection:
Major	MATH 260	3 CH.	Selection:
Gen Ed	Gen. Ed. Elective	3 CH.	Selection:
Gen Ed	Gen. Ed. Elective	3 CH.	Selection:
Total		15 CH.	

Fifth Semester Plan

Major	CPSC Elective Course	3 CH.	Selection:
Major	MATH 302	3 CH.	Selection:
Major	MATH 250	3 CH.	Selection:
Gen Ed	Gen. Ed. Elective	3 CH.	Selection:
Elective	University Elective	3 CH.	Selection:
Total		15 CH.	

Sixth Semester Plan

Major	CPSC 458 <i>or</i> CPSC 459	3 CH.	Selection:
Major	MATH 304 <i>or</i> MATH 325	3 CH.	Selection:
Gen Ed	Gen Ed Elective	3 CH.	Selection:
Elective	University Elective	3 CH.	Selection:
Elective	University Elective	3 CH.	Selection:
Total		15 CH.	

Seventh Semester Plan

Major	CPSC 458 <i>or</i> CPSC459	3 CH.	Selection:
Major	CPSC Elective	3 CH.	Selection:
Gen Ed	Gen. Ed. Elective	3 CH.	Selection:
Gen Ed	Gen. Ed. Elective	3 CH.	Selection:
Elective	University Elective	3 CH.	Selection:
Total		15 CH.	

Eighth Semester Plan

Major	MATH 380 <i>or</i> MATH 390 <i>or</i> MATH 490 <i>or</i> MATH 395 <i>or</i> MATH 398 <i>or</i> CPSC 372 <i>or</i> CPSC 385	3 CH.	Selection:
Gen Ed	Gen. Ed. Elective	3 CH.	Selection:
Elective	University Elective	3 CH.	Selection:
Elective	University Elective	3 CH.	Selection:
Total		12 CH.	

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