

# Data Science

<i>Fall Quarter</i>	<i>Unit: Winter Quarter</i>	<i>Unit: Spring Quarter</i>	<i>Units</i>
<b>FIRST YEAR</b>			
CS 010A <i>C++ Programming I</i>	4 CS 010B or CS 013 <i>C++ Programming II</i>	4 CS 010C <i>Intro to Data Structures &amp; Algorithms</i>	4
ENGL 001A <i>Beginning Composition</i>	4 ENGL 001B <i>Intermediate Composition</i>	4 MATH 009C <i>First Year Calculus</i>	4
MATH 009A <i>First Year Calculus</i>	4 MATH 009B <i>First Year Calculus</i>	4 Breadth _____ <i>Physical Sciences</i>	5
Breadth _____ <i>Humanities/Social Sciences</i>	4 Breadth _____ <i>Humanities/Social Sciences</i>	4	
<b>THIRD YEAR</b>			
CS 100* <i>Software Construction</i>	4 MATH 010A <i>Multivariable Calculus</i>	4 CS 105 <i>Data Analysis Methods</i>	4
MATH 031 <i>Applied Linear Algebra</i>	5 CS/MATH 011 <i>Intro to Discrete Structures</i>	4 CS 111* <i>Discrete Structures</i>	4
STAT 100A* or Equivalent <i>Introduction to Statistics</i>	5 STAT 100B* or Equivalent <i>Introduction to Statistics</i>	5 Breadth _____ <i>Additional Sciences 2</i>	5
Breadth _____ <i>Biological Sciences</i>	4 Breadth _____ <i>Additional Sciences 1</i>	5	
<b>FOURTH YEAR</b>			
STAT 156A <i>Statistics for Data Science I</i>	4 STAT 156B <i>Statistics for Data Science II</i>	4 STAT 167 or CS 171 <i>Intro to Data Science or</i>	4
CS 166 or CS 167 <i>Database Management or BIG Data</i>	4 CS 141 <i>Interm. Data Structures &amp; Algorithms</i>	4 <i>Intro to Mach Lrning&amp;Data Mining</i>	
STAT 147 <i>Intro Stat Computing</i>	4 ENGR/PBPL 170 <i>Technology, Policy, and Ethics</i>	4 DS Technical Elective**	4
Breadth _____ <i>Humanities/Social Sciences</i>	4 Breadth _____ <i>Humanities/Social Sciences</i>	4 Breadth _____ <i>Humanities/Social Sciences</i>	4
<b>FOURTH YEAR</b>			
STAT 170A <i>Regression Analysis</i>	4 STAT 170B <i>Design of Experiments</i>	4 STAT 183 or CS 179 (E-Z) <i>Stat Consulting or Project in CS</i>	4
DS Technical Elective**	4 DS Technical Elective**	4 DS Technical Elective**	4
Application Course Sequence*** <i>Course 1</i>	4 Application Course Sequence*** <i>Course 2</i>		
ENGL 001C or ENGR 180W <i>Technical Communications</i>	4		

To earn a B.S., you must complete all College and University requirements and earn a minimum of 180 units. For a complete list: [catalog.ucr.edu](http://catalog.ucr.edu).

**ENGLISH COMPOSITION**  
A C or better is required in three quarters of English Composition courses to satisfy the graduation requirement. ENGR 180W fulfills third quarter English Composition.

**BREADTH REQUIREMENTS**  
For an approved list of Breadth courses: <http://student.engr.ucr.edu/policies/requirements/breadth.html>.

Humanities: (3 courses)  
 A. World History: \_\_\_\_\_  
 B. Fine Arts/Lit./Phil./Rlst: \_\_\_\_\_  
 C. Human Persp. on Sci: \_\_\_\_\_

Social Sciences: (3 courses)  
 A. Econ or Posc: \_\_\_\_\_  
 B. Anth, Psyc, or Soc: \_\_\_\_\_  
 C. General Social Science: \_\_\_\_\_

Ethnicity: \_\_\_\_\_  
 Biological Science: \_\_\_\_\_  
 Physical Science: \_\_\_\_\_  
 Science 1: \_\_\_\_\_  
 Science 2: \_\_\_\_\_

Upper Division 1: \_\_\_\_\_  
 Upper Division 2: \_\_\_\_\_

Please note that Technical Electives may be offered throughout the Academic Year. Consult with your Academic Advisor about potential offerings. See approved technical electives on back.

Course Plan is subject to change.

\*Highly Recommended Course

## Data Science Technical Electives

You must complete at least four upper division courses (16 units) from the list below, none of which can be used to satisfy other major requirements:

CS 166	Database Management Systems (4)	STAT 104	Decision Analysis and Management Science (4)
CS 167	Intro to BIG-DATA Management (4)	STAT 127	Introduction to Quality Improvements (4)
CS 170	Introduction to Artificial Intelligence (4)	STAT 130	Sampling Surveys (4)
CS 172	Introduction to Information Retrieval (4)	STAT 140	Nonparametric Techniques (4)
CS 180	Introduction to Software Engineering (4)	STAT 146	Statistical Forecasting Techniques (4)
CS 181	Principles of Programming Languages (4)	STAT 157	Statistical Computer Packages (4)
MATH 120	Optimization (4)	STAT 171	General Statistical Models (4)
MATH 135A	Numerical Analysis (4)		

\*\* Technical Electives may require that you complete additional courses as prerequisites that are not accounted for in the undergraduate program. Please go to [www.catalog.ucr.edu](http://www.catalog.ucr.edu) for course descriptions and prerequisite information.

## Data Science Application Course Sequences

\*\*\*One two-course sequence, chosen from the course sequences listed below. Courses must be taken in sequence and cannot be combined to create new sequences.

Economics Sequence:	ECON 108 and ECON 136
Business Sequence 1:	BUS 104 and BUS 123
Business Sequence 2:	BUS 124 and BUS 125
Business Sequence 3:	BUS 103 and BUS 115
Earth Science Sequence 1:	GEO 111 and GEO 161
Earth Science Sequence 2:	GEO 115 and GEO 147
Elect. & Comp. Engr Sequence:	EE 142 and EE 146
Biology/Bioinformatics Sequence:	BIOL 05A and BIOL 020