

# BS in Data Science with Data Processing, Science, and Engineering Concentration

## Degree Requirements

To earn a Bachelor of Science in Data Science with a Data Processing, Science, and Engineering Concentration from UIC, students need to complete university, college, and department degree requirements. The Department of Computer Science degree requirements are outlined below. Students should consult the [College of Engineering](#) section for additional degree requirements and college academic policies.

Code	Title	Hours
<b>Summary of Requirements</b>		
General and Basic Education Requirements		37
Core Courses		57
Data Processing, Science, and Engineering Concentration Requirements		15-17
Free Electives		9-11
<b>Total Hours</b>		<b>120</b>

## General and Basic Education Requirements

Code	Title	Hours
ENGL 160	Academic Writing I: Writing in Academic and Public Contexts	3
ENGL 161	Academic Writing II: Writing for Inquiry and Research	3
Foreign Language <sup>a</sup>		8
Understanding the Individual and Society course <sup>b</sup>		3
Understanding U.S. Society course <sup>b</sup>		3
Exploring World Cultures course <sup>b</sup>		3
Understanding the Creative Arts course <sup>b</sup>		3
Understanding the Past course <sup>b</sup>		3
Two Analyzing the Natural World courses (with lab) <sup>b,c</sup>		8
<b>Total Hours</b>		<b>37</b>

a Additional information on the [COE's foreign language policy](#) can be found in the [College of Engineering](#) section of the catalog.

b Students should consult the [General Education](#) section of the catalog for a list of approved courses.

c Students planning to pursue the [Bioinformatics Concentration](#) will take BIOS 110 and BIOS 120 to fulfill the Analyzing the Natural World requirement.

## Core Courses

Code	Title	Hours
<b>Required Courses</b>		
ENGR 100	Engineering Success Seminar (no graduation credit)	1
MATH 180	Calculus I	4
MATH 181	Calculus II	4
MATH 210	Calculus III	3
MATH 310	Applied Linear Algebra	3
Select one of the following		3
CS 111	Program Design I	
CS 112	Program Design I in the Context of Biological Problems	
CS 113	Program Design I in the Context of Law and Public Policy	
CS 141	Program Design II	3
CS 151	Mathematical Foundations of Computing	3
or MCS 361	Discrete Mathematics	
CS 211	Programming Practicum	3
CS 251	Data Structures	4
CS 377	Ethical Issues in Computing	3
Select one of the following:		3
STAT 381	Applied Statistical Methods I	
IE 342	Probability and Statistics for Engineers <sup>a</sup>	
ECE 341	Probability and Random Processes for Engineers <sup>b</sup>	
STAT 382	Statistical Methods and Computing	3
or IDS 462	Statistical Software for Business Applications	
STAT 385	Elementary Statistical Techniques for Machine Learning and Big Data	3
STAT 481	Applied Statistical Methods II	3
IDS 312	Business Project Management	3
IDS 435	Optimization for Analytics	3
CS 418	Introduction to Data Science <sup>c</sup>	3
or IDS 472	Business Data Mining	
CS 480	Database Systems <sup>c</sup>	3
or IDS 410	Business Database Technology	
<b>Total Hours</b>		<b>57</b>

a IE 342 must be taken for the Concentration in Industrial Engineering.

b ECE 341 must be taken for the Concentration in Data Processing, Science, and Engineering.

c CS 418 and CS 480 must be taken for the Concentration in Computer Science.

## Data Processing, Science, and Engineering Concentration Requirements

Code	Title	Hours
<b>Required Courses</b>		
Note: ECE 341 must be chosen as the selective probability and statistics choice in the Core Courses in order to pursue this concentration.		
MATH 220	Introduction to Differential Equations	3
ECE 310	Discrete and Continuous Signals and Systems	3
<b>Selectives</b>		
Select three of the following:		9-11
ECE 317	Digital Signal Processing I	
ECE 407	Pattern Recognition I	
ECE 415	Image Analysis and Computer Vision I	
ECE 417	Digital Signal Processing II	
ECE 418	Statistical Digital Signal Processing	
ECE 434	Multimedia Systems	
ECE 452	Robotics: Algorithms and Control	
<b>Total Hours</b>		<b>15-17</b>

## Free Electives

Code	Title	Hours
<b>Electives</b>		
Select 9-11 hours of Free Electives.		9-11
<b>Total Hours</b>		<b>9-11</b>

## Sample Course Schedule

Course	Title	Hours
<b>First Year</b>		
<b>First Semester</b>		
CS 111 or CS 112 or CS 113	Program Design I or Program Design I in the Context of Biological Problems or Program Design I in the Context of Law and Public Policy	3
ENGL 160	Academic Writing I: Writing in Academic and Public Contexts	3
MATH 180	Calculus I	4
Analyzing the Natural World (with Lab) General Education course		4
ENGR 100	Engineering Success Seminar (no graduation credit)	1
<b>Hours</b>		<b>14</b>
<b>Second Semester</b>		
CS 141	Program Design II	3
ENGL 161	Academic Writing II: Writing for Inquiry and Research	3
MATH 181	Calculus II	4
General Education Core course		3
Foreign Language		4
<b>Hours</b>		<b>17</b>
<b>Second Year</b>		
<b>First Semester</b>		
CS 151 or MCS 361	Mathematical Foundations of Computing or Discrete Mathematics	3
CS 211	Programming Practicum	3
ECE 341	Probability and Random Processes for Engineers	3
Analyzing the Natural World (with lab) General Education course		4

Foreign Language		4
<b>Hours</b>		<b>17</b>
<b>Second Semester</b>		
CS 251	Data Structures	4
STAT 382 or IDS 462	Statistical Methods and Computing or Statistical Software for Business Applications	3
IDS 312	Business Project Management	3
MATH 210	Calculus III	3
General Education Core course		3
<b>Hours</b>		<b>16</b>
<b>Third Year</b>		
<b>First Semester</b>		
CS 377	Ethical Issues in Computing	3
CS 480 or IDS 410	Database Systems or Business Database Technology	3
STAT 385	Elementary Statistical Techniques for Machine Learning and Big Data	3
MATH 310	Applied Linear Algebra	3
General Education Core course		3
<b>Hours</b>		<b>15</b>
<b>Second Semester</b>		
CS 418 or IDS 472	Introduction to Data Science or Business Data Mining	3
STAT 481	Applied Statistical Methods II	3
IDS 435	Optimization for Analytics	3
Concentration Requirement		3
Free Elective		3
<b>Hours</b>		<b>15</b>
<b>Fourth Year</b>		
<b>First Semester</b>		
Concentration Requirement		3
Concentration Requirement		3-4
General Education Core course		3
Free Elective		3-4
<b>Hours</b>		<b>13</b>
<b>Second Semester</b>		
Concentration Requirement		3-4
Concentration Requirement		3
General Education Core course		3
Free Elective		3-4
<b>Hours</b>		<b>13</b>
<b>Total Hours</b>		<b>120</b>