

# BS in Data Science with a Computer Science Concentration

## Degree Requirements

To earn a Bachelor of Science in Data Science with a Computer Science 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
Computer Science Concentration Requirements		15
Free Electives		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		8
Understanding the Individual and Society course <sup>a</sup>		3
Understanding U.S. Society course <sup>a</sup>		3
Exploring World Cultures course <sup>a</sup>		3
Understanding the Creative Arts course <sup>a</sup>		3
Understanding the Past course <sup>a</sup>		3
Two Analyzing the Natural World courses (with lab) <sup>a,b</sup>		8
<b>Total Hours</b>		<b>37</b>

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

<sup>b</sup> 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 Orientation (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
CS 111	Program Design I	3
CS 141	Program Design II	3

CS 151 or MCS 361	Mathematical Foundations of Computing Discrete Mathematics	3
CS 211	Programming Practicum	2
CS 251	Data Structures	4
CS 377	Communication and 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 or IDS 462	Statistical Methods and Computing Statistical Software for Business Applications	3
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 or IDS 472	Introduction to Data Science <sup>c</sup> Business Data Mining	3
CS 480 or IDS 410	Database Systems <sup>c</sup> Business Database Technology	3
<b>Total Hours</b>		<b>57</b>

<sup>a</sup> IE 342 must be taken for the Concentration in Industrial Engineering.

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

<sup>c</sup> CS 418 and CS 480 must be taken for the Concentration in Computer Science.

## Computer Science Concentration Requirements

Code	Title	Hours
<b>Required Courses</b>		
The following courses must be chosen as the selective choices in the Core courses in order to pursue this concentration.		
CS 418	Introduction to Data Science	
CS 480	Database Systems	
Select five of the following courses, of which at least four must be CS courses:		15
CS 342	Software Design	
CS/MCS 401	Computer Algorithms I	
CS 411	Artificial Intelligence I	
CS 412	Introduction to Machine Learning	
CS 421	Natural Language Processing <sup>a</sup>	
CS 424	Visualization and Visual Analytics	
STAT 461	Applied Probability Models I	
STAT 473	Game Theory	
MCS 471	Numerical Analysis	
<b>Total Hours</b>		<b>15</b>

**Free Electives**

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

<sup>a</sup> CS 301 is a prerequisite for CS 421.

**Sample Course Schedule**

Course	Title	Hours
<b>First Year</b>		
<b>First Semester</b>		
CS 111	Program Design I	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 Orientation	1
<b>Hours</b>		<b>15</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	2
STAT 381 or IE 342 or ECE 341	Applied Statistical Methods I or Probability and Statistics for Engineers or Probability and Random Processes for Engineers	3
Analyzing the Natural World (with lab) General Education course		4
Foreign Language		4
<b>Hours</b>		<b>16</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>

**Third Year****First Semester**

CS 377	Communication and Ethical Issues in Computing	3
CS 480	Database Systems	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>

**Second Semester**

CS 418	Introduction to Data Science	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>

**Fourth Year****First Semester**

Concentration Requirement		3
Concentration Requirement		3
General Education Core course		3
Free Elective		4
<b>Hours</b>		<b>13</b>

**Second Semester**

Concentration Requirement		3
Concentration Requirement		3
General Education Core course		3
Free Elective		4
<b>Hours</b>		<b>13</b>
<b>Total Hours</b>		<b>120</b>