

# BS in Data Science with Industrial Engineering Concentration

## Degree Requirements

To earn a Bachelor of Science in Data Science with an Industrial Engineering Concentration from UIC, students need to complete university, college, and department degree requirements. The 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
Industrial Engineering Concentration Requirements		13
Free Electives		13
<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.

## Industrial Engineering Concentration Requirements

Code	Title	Hours
<b>Required Courses</b>		
Note: IE 342 must be chosen as the selective in the Common Core in order to pursue this concentration.		
IE 345	Regression Applications and Forecasting in Engineering	3
IE 365	Work Productivity Analysis	4
IE 446	Advanced Quality Control and Reliability	3
IE 471	Operations Research I	3
<b>Optional Electives</b>		
IE 442	Design and Analysis of Experiments in Engineering	
IE 461	Safety Engineering	

IE 463	Manufacturing Facilities Design and Material Handling	
IE 466	Production Operation Analytics and Inventory Control	
IE 467	Discrete Event Computer Simulation Application	
IE 472	Operations Research II	
IE 473	Stochastic Processes and Queuing Models	
<b>Total Hours</b>		<b>13</b>

### Free Electives

Code	Title	Hours
<b>Electives</b>		
Select 13 hours of Free Electives.		13
<b>Total Hours</b>		<b>13</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
IE 342	Probability and Statistics 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
General Education Core course		3
Free Elective		4
<b>Hours</b>		<b>13</b>

<b>Second Semester</b>		
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>