BACHELOR OF SCIENCE IN DATA SCIENCE

Required Courses

Code	Title	Credit Hours
Data Science Requirements		**(24-25)**
DS 100	Introduction to the Profession	3
DS 151	Introduction to Data Science	3
Select one of the two options:		6-7
DS 251 & DS 351	Mathematical Foundations for Data Science I and Mathematical Foundations for Data Science II	6
MATH 252 & MATH 350	Introduction to Differential Equations and Introduction to Computational Mathematics	7
DS 261	Ethics and Privacy in Data Science	3
DS 451	Data Science Life Cycle	3
or CSP 571	Data Preparation and Analysis	
MATH 474	Probability and Statistics	3
or MATH 476	Statistics	
MATH 484	Regression	3
or CS 484	Introduction to Machine Learning	
Applied Mathematics Requirements		**(17)**
MATH 151	Calculus I	5
MATH 152	Calculus II	5
MATH 251	Multivariate and Vector Calculus	4
MATH 332	Elementary Linear Algebra	3
Computer Science Requirements		**(10-12)**
Select one of the following sequences:		4-6
CS 115 & CS 116	Object-Oriented Programming I and Object-Oriented Programming II	4
CS 104 & CS 201	Introduction to Computer Programming for Engineers and Accelerated Introduction to Computer Science	6
CS 331	Data Structures and Algorithms	3
CS 425	Database Organization	3
Communication		**(3)**
Select one of the following:		3
COM 421	Technical Communication	3
COM 428	Verbal and Visual Communication	3
INTM 301	Communications for the Workplace	3
ITM 300	Communication in the Workplace	3
SCI 522	Public Engagement for Scientists	3
Ethics and Society		**(3)**
Select one of the following:		3
HIST 385	Women in Computing History	3
ITMM 485	Legal and Ethical Issues in Information Technology	3
PHIL 374	Ethics in Computer Science	3
PHIL 375	Computer Ethics	3
PHIL 381	Artificial Intelligence, Philosophy and Ethics	3
SOC 362	Technology and Social Change	3
Data Science Technical Depth		**(12)**
Select four of the following:		12
CS 422	Data Mining	3
CS 429	Information Retrieval	3
CS 430	Introduction to Algorithms	3
CS 451	Introduction to Parallel and Distributed Computing	3
CS 481	Artificial Intelligence Language Understanding	3
CS 522	Advanced Data Mining	3
CS 577	Deep Learning	3
CS 584	Machine Learning	3
CSP 554	Big Data Technologies	3
MATH 435	Linear Optimization	3
MATH 446	Introduction to Time Series	3
MATH 475	Probability	3
MATH 476	Statistics	3
MATH 535	Optimization I	3
MATH 546	Introduction to Time Series	3
MATH 563	Mathematical Statistics	3
MATH 564	Regression	3
MATH 569	Statistical Learning	3
MATH 574	Bayesian Computational Statistics	3
Data Science Electives		**(12)**
Select 12 credit hours from the following courses, or any other courses in Data Science Technical Depth:		12
COM 383	Social Networks	3
CS 458	Introduction to Information Security	3
or ECE 443	Introduction to Computer Cyber Security	
CS 480	Introduction to Artificial Intelligence	3
CS 487	Software Engineering I	3
CS 512	Computer Vision	3
CS 520	Data Integration, Warehousing, and Provenance	3
CS 546	Parallel and Distributed Processing	3
CS 553	Cloud Computing	3
CS 554	Data-Intensive Computing	3
CS 578	Interactive and Transparent Machine Learning	3
CS 579	Online Social Network Analysis	3
CS 583	Probabilistic Graphical Models	3
CS 585	Natural Language Processing	3
DS 472	Data Science Practicum	3-6
ECE 308	Signals and Systems	3
ECE 442	Internet of Things and Cyber Physical Systems	3
ECE 447	Artificial Intelligence and Edge Computing	3

Course	Title	Credit Hours
ECE 449	Object-Oriented Programming and Machine Learning	3
ECE 481	Image Processing	3
ECE 501	Artificial Intelligence and Edge Computing	3
ECE 510	Internet of Things and Cyber Physical Systems	3
ECE 511	Analysis of Random Signals	3
ECE 520	Information Theory and Applications	3
ECE 521	Quantum Electronics	3
ECE 563	Artificial Intelligence in Smart Grid	3
ECE 565	Computer Vision and Image Processing	3
ECE 566	Machine and Deep Learning	3
ECE 567	Statistical Signal Processing	3
EMGT 363	Creativity, Inventions, and Entrepreneurship for Engineers and Scientists	3
ITMS 418	Coding Security	3
ITMS 448	Cyber Security Technologies	3
ITMS 478	Cyber Security Management	3
MATH 225	Introductory Statistics	3
MATH 380	Introduction to Mathematical Modeling	3
MATH 483	Design and Analysis of Experiments	3
MATH 497	Special Problems	1-20
MATH 527	Machine Learning in Finance: From Theory to Practice	3
MATH 565	Monte Carlo Methods	3
SSCI 325	Intermediate Geographic Information Systems	3
SSCI 480	Introduction to Survey Methodology	3
Science Requirement and Electives		**(10)**
See Illinois Tech Core Curriculum, Section D		10
Humanities and Social Science Requirements		**(21)**
See Illinois Tech Core Curriculum, Sections B and C		21
Interprofessional Projects (IPRO)		**(6)**
See Illinois Tech Core Curriculum, Section E		6
Free Electives		**(9)**
Select nine credit hours		9
Total Credit Hours		**127-130**

Semester 1	Credit Hours	Semester 2	Credit Hours
HUMANITIES 200-LEVEL COURSE	3	SOCIAL SCIENCE ELECTIVE	3
	16		**17**

Year 2

Semester 1	Credit Hours	Semester 2	Credit Hours
MATH 251	4	MATH 474	3
MATH 332	3	DS 261	3
CS 331	3	CS 425	3
SCIENCE ELECTIVE	3	SOCIAL SCIENCE ELECTIVE	3
HUMANITIES OR SOCIAL SCIENCE ELECTIVE	3	SCIENCE ELECTIVE	3
	16		**15**

Year 3

Semester 1	Credit Hours	Semester 2	Credit Hours
DS 251	3	DS 351	3
CS 484	3	COMMUNICATION	3
DS ELECTIVE	3	DS TECH DEPTH	3
FREE ELECTIVE	3	DS TECH DEPTH	3
HUMANITIES ELECTIVE (300+)	3	DS ELECTIVE	3
	15		**15**

Year 4

Semester 1	Credit Hours	Semester 2	Credit Hours
DS 451	3	DS 472	3-6
FREE ELECTIVE	3	FREE ELECTIVE	3
DS TECH DEPTH	3	DS TECH DEPTH	3
IPRO	3	IPRO	3
SOCIAL SCIENCE ELECTIVE (300+)	3	HUMANITIES ELECTIVE (300+)	3
DS ELECTIVE	3		
	18		**15-18**

Total Credit Hours: 127-130

Bachelor of Science in Data Science Curriculum

Year 1

Semester 1	Credit Hours	Semester 2	Credit Hours
DS 100	3	ETHICS AND SOCIETY	3
DS 151	3	MATH 152	5
MATH 151	5	CS 116	2
CS 115	2	SCIENCE ELECTIVE	4