

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 or CSP 571	Data Science Life Cycle Data Preparation and Analysis	3
MATH 474 or MATH 476	Probability and Statistics Statistics	3
MATH 484 or CS 484	Regression Introduction to Machine Learning	3
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
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		(9)
Select three of the following:		9
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 or ECE 443	Introduction to Information Security Introduction to Computer Cyber Security	3
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

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
STAT 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		(2-5)
Select two to five credit hours ¹		2-5

Minimum degree credits required: 120

¹ Students who complete MATH 252 and MATH 350 instead of DS 251 and DS 351 will need to take 4 credits of free electives. Students who complete CS 104 and CS 201 instead of CS 115 and CS 116 will need to take 3 credits of free electives. Students who complete all of MATH 252, MATH 350, CS 104, and CS 201 instead of DS 251, DS 351, CS 115, and CS 116 will need to take 2 credits of free electives.

Bachelor of Science in Data Science Curriculum

			Year 1
Semester 1	Credit Hours	Semester 2	Credit Hours
DS 100	3	MATH 152	5
DS 151	3	CS 116	2
MATH 151	5	Ethics and Society	3
CS 115	2	Science Elective	4
Humanities 200-level course	3	Social Science Elective	3
			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 (300+)	3
Humanities or Social Science Elective	3	Science Elective	3
			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
Humanities Elective (300+)	3	DS Elective	3
Free Elective	2-3	Free Elective	3
			14-15
			Year 4
Semester 1	Credit Hours	Semester 2	Credit Hours
DS 451	3	DS 472	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		
			12
Total Credit Hours: 120-121			