DATA SCIENCES, B.S. (INFORMATION SCIENCES AND TECHNOLOGY)

Begin Campus: Any Penn State Campus

End Campus: University Park

Suggested Academic Plan

The suggested academic plan(s) listed on this page are the plan(s) that are in effect during the 2023-24 academic year. To access previous years' suggested academic plans, please visit the archive (https://bulletins.psu.edu/undergraduate/archive/) to view the appropriate Undergraduate Bulletin edition (*Note: the archive only contains suggested academic plans beginning with the 2018-19 edition of the Undergraduate Bulletin*).

Applied Data Sciences Option: Data Sciences, B.S. at University Park Campus

- View the Suggested Academic Plan for the Computational Data Sciences Option (https://bulletins.psu.edu/undergraduate/colleges/engineering/data-sciences-bs/#suggestedacademicplantext)
- View the Suggested Academic Plan for the Statistical Modeling Data Sciences Option (https://bulletins.psu.edu/undergraduate/colleges/eberly-science/data-sciences-bs/#suggestedacademicplantext)

The course series listed below provides **only one** of the many possible ways to move through this curriculum. The University may make changes in policies, procedures, educational offerings, and requirements at any time. This plan should be used in conjunction with your degree audit (accessible in LionPATH as either an **Academic Requirements** or **What If** report). Please consult with a Penn State academic adviser on a regular basis to develop and refine an academic plan that is appropriate for you.

First Year

Fall	Credits	Spring	Credits
MATH 140 (GQ)*‡#	4	MATH 141 (GQ)*#	4
CMPSC 131*#	3	CMPSC 132*#	3
ENGL 15 (GWS)‡	3	DS 200*#	4
General Education Course	3	General Education Course	3
PSU 17	1	General Education Course	3
	14		**17**

Second Year

Fall	Credits	Spring	Credits
DS 220*	3	IST 230, CMPSC 360, or MATH 311W*	3
MATH 220*	2	STAT/MATH 318, 414, or 418*	3
CAS 100 (GWS)‡	3	ENGL 202 (GWS)‡	3
STAT 184	2	General Education Course	3
General Education Course	3	General Education Course	3
General Education Course	3		
	16		**15**

Third Year

Fall	Credits	Spring	Credits	Summer	Credits
DS 300*	3	DS 330*	3	IST 495*1	1
DS 305*	3	DS 410*	3		
DS 310*	3	STAT 380*	3		
DS 320*	3	Application Focus Selection	3		
Application Focus Selection	3	General Education Course	3		
	15		**15**		**1**

Fourth Year

Fall	Credits	Spring	Credits
DS 340W*	3	DS 440 or 440W*	3
DS 442, IST 442, SODA 308, IST 445, DS 420, 441, DS 402, or IST 494	3	DS 442, IST 442, SODA 308, IST 445, DS 420, 441, DS 402, or IST 494	3
DS 435*	3	Application Focus Selection (300- or 400-level)	3
Application Focus Selection (300- or 400-level)	3	General Education Course	3
General Education Course	3	Elective	3
	15		**15**

Total Credits 123

* Course requires a grade of C or better for the major

‡ Course requires a grade of C or better for General Education

\# Course is an Entrance to Major requirement

† Course satisfies General Education and degree requirement

1 1 credit of IST 495 is required. A grade of "SA" must be earned in this course. This course can be completed at any time before graduation.

University Requirements and General Education Notes:

US and IL are abbreviations used to designate courses that satisfy Cultural Diversity Requirements (United States and International Cultures).

W, M, X, and Y are the suffixes at the end of a course number used to designate courses that satisfy University Writing Across the Curriculum requirement.

General Education includes Foundations (GWS and GQ), Knowledge Domains (GHW, GN, GA, GH, GS) and Integrative Studies (Inter-domain) requirements. N or Q (Honors) is the suffix at the end of a course number used to help identify an Inter-domain course, but the inter-domain attribute is used to fill audit requirements. Foundations courses (GWS and GQ) require a grade of 'C' or better.

All incoming Schreyer Honors College first-year students at University Park will take ENGL 137H/CAS 137H in the fall semester and ENGL 138T/CAS 138T in the spring semester. These courses carry the GWS designation and satisfy a portion of that General Education requirement. If the student's program prescribes GWS these courses will replace both ENGL 15/ENGL 30H and CAS 100A/CAS 100B/CAS 100C. Each course is 3 credits.

Advising Notes:

DS, IST, SRA, and MATH courses have enforced prerequisites.

Application Focus Course Listings
Select a minimum of 12 credits from your chosen focus area; at least 6 credits must be at the 300- or 400-levels. Students may also propose a custom application focus, with guidance and approval by an academic adviser or the program coordinator of the Applied DS Option.

Information and Cybersecurity Sciences

Code	Title	Credits
CYBER 100	Computer Systems Literacy	3
CYBER 100S	Computer Systems Literacy	3
DS 402	Emerging Trends in the Data Sciences	3
IST 140	Introduction to Application Development	3
SRA 111	Introduction to Security and Risk Analysis	3
IST 210	Organization of Data	3
IST 220	Networking and Telecommunications	3
STAT 200	Elementary Statistics	4
SRA 211	Threat of Terrorism and Crime	3
SRA 221	Overview of Information Security	3
SRA 231	Decision Theory and Analysis	3
IST 240	Introduction to Computer Languages	3
IST 242	Intermediate & Object-Oriented Application Development	3
IST 261	Application Development Design Studio I	3
CYBER 262	Cyber-Defense Studio	3
SRA 365	Statistics for Security and Risk Analysis	3
SRA 450	Cyber-Crime and Cyber-Warfare	3
SRA 468	Spatial Analysis of Risks	3
SRA 480	Crisis Informatics	3
IST 451	Network Security	3
IST 454	Computer and Cyber Forensics	3
IST 456	Information Security Management	3

Human-Centered Design and Development

Code	Title	Credits
HCDD 113	Foundations of Human-Centered Design and Development	3
HCDD 113S	Foundations of Human-Centered Design and Development FYS	3
IST 140	Introduction to Application Development	3
IST 240	Introduction to Computer Languages	3
IST 242	Intermediate & Object-Oriented Application Development	3
IST 210	Organization of Data	3
IST 220	Networking and Telecommunications	3
HCDD 264	Design Practice in Human-Centered Design and Development	3
IST 261	Application Development Design Studio I	3
IST 311	Object-Oriented Design and Software Applications	3
HCDD 340	Human-Centered Design for Mobile Computing	3
HCDD 364W	Methods for Studying Users	3
IST 402	Emerging Issues and Technologies	3
DS 402	Emerging Trends in the Data Sciences	3

Business Fundamentals

Code	Title	Credits
ECON 102	Introductory Microeconomic Analysis and Policy	3
ECON 104	Introductory Macroeconomic Analysis and Policy	3
ACCTG 211	Financial and Managerial Accounting for Decision Making	4
STAT 200	Elementary Statistics	4
SCM 200	Introduction to Statistics for Business	4
BA 301	Finance	3
BA 302	Supply Chains	3
BA 303	Marketing	3
BA 304	Management and Organization	3
BLAW 243	Legal Environment of Business	3
IB 303	International Business Operations	3
DS 402	Emerging Trends in the Data Sciences	3

Economics

Code	Title	Credits
ECON 102	Introductory Microeconomic Analysis and Policy	3
ECON 104	Introductory Macroeconomic Analysis and Policy	3
ECON 106	Statistical Foundations for Econometrics	3
STAT 200	Elementary Statistics	4
SCM 200	Introduction to Statistics for Business	4
ECON 302	Intermediate Microeconomic Analysis	3
ECON 304	Intermediate Macroeconomic Analysis	3
ECON 315	Labor Economics	3
ECON 323	Public Finance	3
ECON 333	International Economics	3
ECON 342	Industrial Organization	3
ECON 402	Decision Making and Strategy in Economics	3
ECON 404		3
ECON 406		3
ECON 407	Political Economy	3

ECON 408		3
ECON 410	Economics of Labor Markets	3
ECON 415	The Economics of Global Climate Change	3
ECON 421		3
ECON 424		3
ECON 425	Economics of Public Expenditures	3
ECON 428	Environmental Economics	3
ECON 442	Managerial Economics	3
ECON 445	Health Economics	3
ECON 447	Economics of Sports	3
ECON 471	Growth and Development	3
ECON 479	Economics of Matching	3
ECON 480	Mathematical Economics	3
DS 402	Emerging Trends in the Data Sciences	3

Psychology

Code	Title	Credits
PSYCH 100	Introductory Psychology	3
PSYCH 200	Elementary Statistics in Psychology	4
STAT 200	Elementary Statistics	4
PSYCH 212	Introduction to Developmental Psychology	3
PSYCH 221	Introduction to Social Psychology	3
PSYCH 243	Introduction to Well-being and Positive Psychology	3
PSYCH 253	Introduction to Psychology of Perception	3
PSYCH 256	Introduction to Cognitive Psychology	3
PSYCH 260	Neurological Bases of Human Behavior	3
PSYCH 261	Introduction to Psychology of Learning	3
PSYCH 270	Introduction to Abnormal Psychology	3
PSYCH 370	Psychology of the Differently-Abled	3
PSYCH 404	Principles of Measurement	3
PSYCH 410	Child Development	3
PSYCH 412	Adolescence	3
PSYCH 413	Cognitive Development	3
PSYCH 419	Psychology and a Sustainable World	3
PSYCH 423	Social Psychology of Interpersonal/Intergroup Relationships	3
PSYCH 424	Applied Social Psychology	3
PSYCH 425	Psychology of Human Emotion	3
PSYCH 441	Health Psychology	3
PSYCH 449	Basic Counseling Skills	3
PSYCH 452	Learning and Memory	3
PSYCH 455	Cognitive Neuroscience	3
PSYCH 457	Psychology of Language	3
PSYCH 456	Advanced Cognitive Psychology	3
PSYCH 458	Visual Cognition	3
PSYCH 473	Behavior Modification	3
PSYCH 484	Work Attitudes and Motivation	3
DS 402	Emerging Trends in the Data Sciences	3

Nutrition

Code	Title	Credits
BIOL 141	Introduction to Human Physiology	3
CHEM 110	Chemical Principles I	3
CHEM 112	Chemical Principles II	3

CHEM 202	Fundamentals of Organic Chemistry I	3
CHEM 210	Organic Chemistry I	3
BMB 211	Elementary Biochemistry	3
NUTR 100	Nutrition Applications for a Healthy Lifestyle	3
NUTR 175		3
NUTR 211R	Applying Biochemistry to Nutrition	1
NUTR 251	Introductory Principles of Nutrition	3
NUTR 358	Assessment of Nutritional Status	3
NUTR 360	Nutrition Education and Behavior Change Theory	3
NUTR 361	Community and Public Health Nutrition	3
NUTR 390	Nutritional Biochemistry and Physiology	4
NUTR 400	Introduction to Nutrition Counseling	2
NUTR 407	Nutrition for Exercise and Sports	3
NUTR 410	Eating and Weight Disorders	3
NUTR 421	Biocultural Perspectives on Public Health Nutrition	3
NUTR 425	Global Nutrition Problems: Health, Science, and Ethics	3
NUTR 445	Energy and Macronutrient Metabolism	3
DS 402	Emerging Trends in the Data Sciences	3

Food Science

Code	Title	Credits
FDSC 105	Food Facts and Fads	3
CHEM 110	Chemical Principles I	3
FDSC 200	Introductory Food Science	3
FDSC 201	Introductory Food Science Practicum	1
FDSC 206	Improving Food Quality	3
MICRB 201	Introductory Microbiology	3
MICRB 202	Introductory Microbiology Laboratory	2
BMB 211	Elementary Biochemistry	3
BMB 212	Elementary Biochemistry Laboratory	1
STAT 200	Elementary Statistics	4
STAT 240	Introduction to Biometry	3
STAT 250	Introduction to Biostatistics	3
FDSC 400	Food Chemistry and Analysis (I)	3
FDSC 403	Sensory Data Collection & Analysis	3
FDSC 404	Sensory Evaluation of Foods	3
FDSC 405	Food Engineering Principles	3
FDSC 406W	Physiology of Nutrition	3
FDSC 408	Food Microbiology	3
FDSC 409	Laboratory in Food Microbiology	2
FDSC 410	Food Chemistry and Analysis (II)	3
FDSC 413	Science and Technology of Plant Foods	3
FDSC 414	Science and Technology of Dairy Foods	3
FDSC 415	Science and Technology of Muscle Foods	3
FDSC 430	Unit Operations in Food Processing	3
FDSC 444	Arguing about Food	3
DS 402	Emerging Trends in the Data Sciences	3

Astronomy

Code	Title	Credits
ASTRO 21	Introduction to Research in Astronomy	2
ASTRO 120	The Big Bang Universe	3
ASTRO 130	Black Holes in the Universe	3

ASTRO 140	Life in the Universe	3
ASTRO 291	Astronomical Methods and the Solar System	3
ASTRO 292	Astronomy of the Distant Universe	3
ASTRO 401	Fundamentals of Planetary Science and Astronomy	4
ASTRO 402W	Astronomical Telescopes, Techniques, and Data Analysis	3
ASTRO 496	Independent Studies	1-3
BIOL/GEOSC 474	Astrobiology	3
PHYS 211	General Physics: Mechanics	4
PHYS 212	General Physics: Electricity and Magnetism	4
PHYS 250	Introductory Physics I	4
PHYS 251	Introductory Physics II	4
DS 402	Emerging Trends in the Data Sciences	3

Custom Application Focus

There is an option for a student to create a custom 4-course application focus sequence. It must be a coherent sequence of courses that provides context for the student in terms of content relevant to the Data Sciences program. This sequence gives the student an opportunity to receive cross-training in another domain so that the student can effectively formulate and solve data science problems in the context of the chosen domain. The sequence should contain at least six credits of 300- or 400-level coursework. It must be selected in consultation with an academic adviser or the program coordinator for the Applied Option of the Data Sciences program.