

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

Seven Penn State campuses are scheduled for closure after Spring 2027: DuBois, Fayette, New Kensington, Mont Alto, Shenango, Wilkes-Barre, and York. New students are not being admitted at these campuses.

**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 2026-27 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.

### 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/eberry-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<br>(GQ) <sup>*†#</sup> | 4 MATH 141<br>(GQ) <sup>*#</sup> | 4       |
| CMPSC 131 <sup>*#</sup>         | 3 CMPSC 132 <sup>*#</sup>        | 3       |
| ENGL 15<br>(GWS) <sup>‡</sup>   | 3 DS 200 <sup>*#</sup>           | 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 <sup>*</sup> | 3 IST 230, CMPSC 360, or MATH 311W <sup>*</sup> | 3       |

|                               |                                           |   |
|-------------------------------|-------------------------------------------|---|
| MATH 220 <sup>*</sup>         | 2 STAT/MATH 318, 414, or 418 <sup>*</sup> | 3 |
| CAS 100<br>(GWS) <sup>‡</sup> | 3 ENGL 202<br>(GWS) <sup>‡</sup>          | 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 <sup>*</sup>         | 3 DS 310 <sup>*</sup>         | 3 IST 495 <sup>*1</sup> | 1       |
| DS 305 <sup>*</sup>         | 3 DS 330 <sup>*</sup>         | 3                       |         |
| DS 320 <sup>*</sup>         | 3 DS 410 <sup>*</sup>         | 3                       |         |
| STAT 380 <sup>*</sup>       | 3 Application Focus Selection | 3                       |         |
| Application Focus Selection | 3 General Education Course    | 3                       |         |

15

15

1

#### Fourth Year

| Fall                                                                   | Credits Spring                                                           | Credits |
|------------------------------------------------------------------------|--------------------------------------------------------------------------|---------|
| DS 340W <sup>*</sup>                                                   | 3 DS 440 or 440W <sup>*</sup>                                            | 3       |
| DS 442, IST 442, SODA 308, IST 445, DS 420, DS 441, DS 402, or IST 494 | 3 DS 442, IST 442, SODA 308, IST 445, DS 420, DS 441, DS 402, or IST 494 | 3       |
| DS 435 <sup>*</sup>                                                    | 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

<sup>1</sup> 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 Areas:**

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.

**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       |
| DS 402         | Emerging Trends in the Data Sciences                   | 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       |

**Business Fundamentals**

| Code      | Title                                                   | Credits |
|-----------|---------------------------------------------------------|---------|
| ACCTG 211 | Financial and Managerial Accounting for Decision Making | 4       |
| BA 301    | Finance                                                 | 3       |

|              |                                                |   |
|--------------|------------------------------------------------|---|
| or FIN 100   | Introduction to Finance                        |   |
| or FIN 301   | Corporation Finance                            |   |
| BA 302       | Supply Chains                                  | 3 |
| or SCM 301   | Supply Chain Management                        |   |
| BA 303       | Marketing                                      | 3 |
| or MKTG 221W | Contemporary American Marketing                |   |
| or MKTG 301  | Principles of Marketing                        |   |
| or MKTG 301W | Principles of Marketing                        |   |
| BA 304       | Management and Organization                    | 3 |
| or MGMT 100  | Survey of Management                           |   |
| or MGMT 100W | Survey of Management                           |   |
| or MGMT 301  | Basic Management Concepts                      |   |
| or MGMT 301W | Basic Management Concepts                      |   |
| BLAW 243     | Legal Environment of Business                  | 3 |
| DS 402       | Emerging Trends in the Data Sciences           | 3 |
| ECON 102     | Introductory Microeconomic Analysis and Policy | 3 |
| ECON 104     | Introductory Macroeconomic Analysis and Policy | 3 |
| IB 303       | International Business Operations              | 3 |
| SCM 200      | Introduction to Statistics for Business        | 4 |
| STAT 200     | Elementary Statistics                          | 4 |

**Economics**

| Code     | Title                                                             | Credits |
|----------|-------------------------------------------------------------------|---------|
| DS 402   | Emerging Trends in the Data Sciences                              | 3       |
| ECON 102 | Introductory Microeconomic Analysis and Policy                    | 3       |
| ECON 104 | Introductory Macroeconomic Analysis and Policy                    | 3       |
| ECON 106 | Statistical Foundations for Econometrics                          | 3       |
| 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 407 | Political Economy                                                 | 3       |
| ECON 410 | Economics of Labor Markets                                        | 3       |
| ECON 415 | The Economics of Global Climate Change                            | 3       |
| ECON 425 | Economics of Public Expenditures                                  | 3       |
| ECON 428 | Environmental Economics                                           | 3       |
| ECON 442 | Monopoly, Competition, and their Regulation, 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       |
| SCM 200  | Introduction to Statistics for Business                           | 4       |
| STAT 200 | Elementary Statistics                                             | 4       |

**Food Science**

| Code    | Title                              | Credits |
|---------|------------------------------------|---------|
| BMB 211 | Elementary Biochemistry            | 3       |
| BMB 212 | Elementary Biochemistry Laboratory | 1       |

|           |                                        |   |
|-----------|----------------------------------------|---|
| CHEM 110  | Chemical Principles I                  | 3 |
| DS 402    | Emerging Trends in the Data Sciences   | 3 |
| FDSC 105  | Food Facts and Fads                    | 3 |
| FDSC 200  | Introductory Food Science              | 3 |
| FDSC 201  | Introductory Food Science Practicum    | 1 |
| FDSC 206  |                                        | 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  |                                        | 3 |
| FDSC 444  | Arguing about Food                     | 3 |
| MICRB 201 | Introductory Microbiology              | 3 |
| MICRB 202 | Introductory Microbiology Laboratory   | 2 |
| STAT 200  | Elementary Statistics                  | 4 |
| STAT 240  | Introduction to Biometry               | 3 |
| STAT 250  | Introduction to Biostatistics          | 3 |

### Human-Centered Design and Development

| Code                   | Title                                                    | Credits |
|------------------------|----------------------------------------------------------|---------|
| DS 402                 | Emerging Trends in the Data Sciences                     | 3       |
| HCDD 113               | Foundations of Human-Centered Design and Development     | 3       |
| HCDD 113S              | Foundations of Human-Centered Design and Development FYS | 3       |
| HCDD 264               | Design Practice in Human-Centered Design and Development | 3       |
| HCDD 311<br>or IST 311 | Object-Oriented Design and Software Applications         | 3       |
| HCDD 331<br>or IST 331 | Foundations of Human-Centered Design                     | 3       |
| HCDD 340               | Human-Centered Design for Mobile Computing               | 3       |
| HCDD 364W              | Methods for Studying Users                               | 3       |
| HCDD 411<br>or IST 411 | Distributed-Object Computing                             | 3       |
| HCDD 412<br>or IST 412 | The Engineering of Complex Software Systems              | 3       |
| HCDD 413<br>or IST 413 | Usability Engineering                                    | 3       |
| IST 140                | Introduction to Application Development                  | 3       |
| IST 210                | Organization of Data                                     | 3       |
| IST 220                | Networking and Telecommunications                        | 3       |
| IST 240                | Introduction to Computer Languages                       | 3       |
| IST 242                | Intermediate & Object-Oriented Application Development   | 3       |

|         |                                         |   |
|---------|-----------------------------------------|---|
| IST 261 | Application Development Design Studio I | 3 |
| IST 402 | Emerging Issues and Technologies        | 3 |

### Information and Cybersecurity Sciences

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

### Nutrition

| Code      | Title                                                              | Credits |
|-----------|--------------------------------------------------------------------|---------|
| BIOL 141  | Introduction to Human Physiology                                   | 3       |
| BMB 211   | Elementary Biochemistry                                            | 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       |
| DS 402    | Emerging Trends in the Data Sciences                               | 3       |
| NUTR 100  | Nutrition Applications for a Healthy Lifestyle                     | 3       |
| NUTR 175N | Healthy Food for All: Factors that Influence What we Eat in the US | 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 |

### Psychology

| Code      | Title                                                       | Credits |
|-----------|-------------------------------------------------------------|---------|
| DS 402    | Emerging Trends in the Data Sciences                        | 3       |
| PSYCH 100 | Introductory Psychology                                     | 3       |
| PSYCH 200 | Elementary Statistics in Psychology                         | 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 456 | Advanced Cognitive Psychology                               | 3       |
| PSYCH 457 | Psychology of Language                                      | 3       |
| PSYCH 458 | Visual Cognition                                            | 3       |
| PSYCH 473 | Behavior Modification                                       | 3       |
| PSYCH 484 | Work Attitudes and Motivation                               | 3       |
| STAT 200  | Elementary Statistics                                       | 4       |

### 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.