

**New Undergraduate Program (Majors, Minors, Sequences) Proposal
Illinois State University - University Curriculum Committee**

Program Department Interdisciplinary Studies

Initiator Amy Hurd

Phone 438-5557

Initiator Department Interdisciplinary Studies

Coauthor(s) None

Title of New Program Data Science, Individualized Plan of Study Sequence

Submission Date Monday, December 12, 2022

Email arhurd@ilstu.edu

Campus Address Provost's Office

Version 1 **ID** 419

Proposed Starting Catalog Year 2024-2025

1. Proposed Action

New Major

New Minor

✓ New Sequence

More than 50% of courses in this program are Distance Education

Sequence Major

Data Science

2. Provide *Undergraduate Catalog* copy for new program.

Individualized Plan of Study Sequence

The Individualized Plan of Study sequence allows students to develop an individualized focus of study and provides for a path towards completion of the degree if a student does not fulfill all the requirements in one of the other sequences.

Major Requirements

Minimum required credit hours: 76

- IT 168 Structured Problem Solving (4)
- IT 179 Introduction to Data Structures (3)
- IT 180 C++ (1)
- IT 279 Algorithms and Data Structures (3)
- IT 348 Introduction to Machine Learning (3)
- MAT 145 Calculus I (4)
- MAT 146 Calculus II (4)
- MAT 147 Calculus III (4)
- MAT 175 Elementary Linear Algebra (4)
- MAT 260 Discrete Mathematics (4)
- MAT 350 Applied Probability Models (4)
- MAT 351 Statistics and Data Analysis (4)
- MAT 355 Generalized Linear Models and Predictive Modeling (4)

Take 21 credit hours of electives

Please consult your academic advisor for an approved plan of study

Take one of the following:

- POL 309 Data Analysis and Data Visualization in Political Science (3)
- CTK 302 Computer Programming for Creatives (3)
- IT 352 Data and Information Visualization (3)

Take one of the following:

- PHI 234 Business Ethics (3)
- MKT 236 Business Ethics, Social Responsibility, and Sustainability (3)
- IT 214 Social, Legal, and Ethical Issues in Information Technology (3)

Take one of the following:

- IDS 398.05 (3 credit hours)
- IDS 388 (3 credit hours)

3. Provide a description for the proposed program.

The IDS Data Science major prepares students with the technical knowledge and computational skills to meet current and future problem solving and analysis of large data sets. The IDS Data Science major is an interdisciplinary major with three core areas of curricula including: 1) mathematics and statistics, 2) information technology and computer science, and 3) an applied sequence for contextual application in an area linked to the future career path of the student. The sequences include 1) Big Data and Computational Intelligence, 2) Business Analytics, 3) Population Health, 4) Social Demographic/Public Policy analytics, and 5) Individualized Plan of Study.

The core curriculum will include 32 credit hours of Mathematics courses (20 hours basic and 12 hours advanced courses), 14 credit hours of Information Technology courses, one ethics course, one data visualization course, and one capstone/internship course. The capstone course will be an instructor led course to complete an applied data science project from an external partner. As an alternative to the campus-based capstone project course, students may elect to complete an externally based internship for the equivalent of a 3-credit hour course. The sequence will consist of five to seven additional courses. The proposal provides for five sequences including: 1) Big Data and Computational Intelligence, 2) Business Analytics, 3) Population Health, 4) Social Demographic/Public Policy analytics, and 5) Individualized Plan of Study.

4. Provide a rationale of proposed program.

An increase in employer demand and a large number of relevant job postings indicate strong need for program graduates. In the last 12 months, employers posted a high number of relevant job postings both locally and regionally (i.e., 49,180 and 113,459 job postings, respectively). Between June 2018 and May 2021, employer demand growth for bachelor's-level data science professionals outpaced employer demand growth for all bachelor's-level professionals both locally (i.e., 1.60 percent compared to 0.92 percent), and regionally (i.e., 1.81 percent compared to 0.92 percent). Additionally, local and regional employment is projected to increase faster than average in all top occupations. This indicates a large and growing labor market for program graduates with increasing employment opportunities in the coming years.

5. Describe the expected effects of the proposed program on existing campus programs (if applicable).

Upon approval, the major will begin with approximately 50 students and this number of students can be absorbed within the existing departments and courses. As demand grows, faculty will be needed in the core areas of mathematics and information technology. If there is disproportionate distribution of students to the sequences, there may need to be additional faculty resources with future growth. As this is a distinct major, it is anticipated that this will attract new students to Illinois State University who are not currently choosing ISU.

6. Provide a sample four-year plan of study that fulfills the following requirements: 120 hours, 42 senior college hours (200 and 300 level courses), and 39 General Education Program hours or 36 hours with exemption. If the program is a BS program, show the BS-SMT degree requirement. If the program is from CAS, show Foreign Language Requirement (LAN 111/LAN 112). Confirm General Education requirement exemptions on the General Education page of the current Academic Catalog. *4-year plans are not required for minor program proposals.*

Four-year Plan of Study for Population Health Sequence (120 hours)

First Year – Fall Semester (16 credit hours)

MAT 145 (General Education) (4)
 IT 168 (3)
 ENG 101 or COM 110 (General Education) (3)
 General Education (3)
 General Education (3)

First Year – Spring Semester (16 credit hours)

MAT 146 (General Education) (4)
 IT 179 (3)
 ENG 101 or COM 110 (General Education) (3)
 General Education (3)
 General Education (3)

Second Year – Fall Semester (15 credit hours)

MAT 147 (BS-SMT) (4)
 MAT 260 (4)
 IT 180 (1)
 General Education (AMALI) (3)
 Senior-level University-wide elective (3)

Second Year – Spring Semester (16 credit hours)

MAT 350 (4)
 IT 279 (3)
 General Education (3)
 Senior-level University-wide elective (3)
 Major elective course (3)

Third Year – Fall Semester (17 credit hours)

MAT 175 (4)
 MAT 351 (4)
 Major elective course (3)
 Major elective course (3)
 General Education (3)

Third Year – Spring Semester (15 credit hours)

IT 348 (3)
 Major elective course (3)
 General Education (3)
 Senior-level University-wide elective (3)
 PHI 234, MKT 236, or IT 214 (3)

Fourth Year – Fall Semester (12 credit hours)

POL 309, CTK 302, or IT 352 (3)
 Major elective course (3)
 Major elective course (3)
 University-wide elective (3) (IDEAS)

Fourth Year – Spring Semester (13 credit hours)

MAT 355 (4)
 IDS 388, or IDS 398A05 (3)
 Major elective course (3)
 Senior-level University-wide elective (3)

7. Describe the expected curricular changes required, including new courses. If proposals for new courses have also been submitted, please reference those related proposals here:

This program will require two new courses including a capstone course (IDS 388) and an internship course (IDS 398.05).

8. Anticipated funding needs and source of funds.

This program will need 1.5 administrative personnel staff hired by year 5 of the program. An AP staff with duties including academic advising and a capstone/internship coordination will be needed in year 1. By year 5 the initial AP will coordinate internship/capstone courses and teach 1 course each semester in the capstone. At this point a .5 advisor will be needed to cover the highly-specialized advisement.

In year 1, the program will need 1 MAT tenure track faculty member who specializes in Applied & Pure Mathematics and 1 IT faculty member. In year 2, the program will need 1 BIS and 1 MKT faculty members. By year 5 the total number of new tenure track faculty members will be 11 comprised of:

4 MAT tenure track faculty members who specialize in Applied & Pure Mathematics and Statistics
 3 IT
 2 BIS
 2 MKT

With a projection of 50 students per year, by year 5 with 250 and projected tuition revenue of \$8500 per student, the program will generate \$2,125,000. The personnel costs will be \$1,300,000.

9. **No** Does this program count for teacher education?

10. **Yes** Is this an Interdisciplinary Studies program?

List all departments who share in the administration of this program.

Interdisciplinary Studies
 Accounting
 Health Sciences
 School of Information Technology
 Marketing
 Mathematics
 Politics and Government
 Sociology

11. **The following questions must be answered.**

Yes Have you confirmed that Milner Library has sufficient resources for the proposed program?

No Are more than 120 hours required to complete a degree with this major?

Yes Beyond General Education, does the major require more than 66 semester hours?

Rationale for mandating over 66 hours in the major. [Required Hours Policy](#)

As an interdisciplinary program, it is necessary to included depth of knowledge in disciplines along with the breadth of knowledge across disciplines. Required courses for the major along with General Education requirements still puts students below the 120 credit hour mark.

Yes Does this sequence (if in a major) require more than 55 semester hours of courses in the major department/school?

No Does this program stipulate specific general education courses offered in the major department/school as a part of the major requirements only if such courses serve as prerequisites for other courses required by the major?

Yes Does this program stipulate specific course requirements (majors/sequences only) that also satisfy general education and/or IAI requirements?

Please specify those courses below.

MAT 145 (MAT)
 MAT 146 (QR, BS-SMT)
 MAT 147 (BS-SMT)
 MAT 175 (BS-SMT)

No Is the proposed program intended to be longer than four years (as indicated by the plan of study)?

N.A. Have letter(s) of concurrence from affected departments/schools been obtained?
A departments/school is affected if it has a program with significant overlap or if it teaches a required or elective course in the program.

12. **Routing and action summary for New Program:**

1. Interdisciplinary Studies Department Curriculum Committee Chair

<u>Amy Hurd (website)</u>	Amy Hurd	12/12/2022 4:41:16 PM
Signature	Print	Date

2. Interdisciplinary Studies Department Chair/School Director

<u>Amy Hurd (website)</u>	Amy Hurd	12/12/2022 4:41:32 PM
Signature	Print	Date

3. Sociology Department Chair

<u>Joan Brehm (website)</u>	Joan Brehm	12/12/2022 5:12:55 PM
Signature	Print	Date

4. Mathematics Department Chair

<u>Gaywalee Yamskulna (website)</u>	Gaywalee Yamskulna	12/12/2022 5:15:09 PM
Signature	Print	Date

5. Marketing Department ChairHorace Melton (website)

Signature

Horace Melton

Print

12/12/2022 5:16:18 PM

Date

6. Health Sciences Department ChairDavid Grieshaber (website)

Signature

David Grieshaber

Print

12/14/2022 4:37:47 PM

Date

7. School of Information Technology Department ChairTraci Carte (website)

Signature

Traci Carte

Print

12/15/2022 2:34:53 PM

Date

8. Accounting Department ChairJoseph Johnston (website)

Signature

Joseph Johnston

Print

12/15/2022 2:42:52 PM

Date

9. Politics and Government Department ChairThomas McClure (website)

Signature

Thomas McClure

Print

12/16/2022 10:22:40

Date

10. Council on General Education ChairGregory Ferrence (website)

Signature

Gregory Ferrence

Print

2/9/2023 1:56:03 PM

Date

11. University Curriculum Committee ChairMary Califf (website)

Signature

Mary Califf

Print

3/22/2023 5:04:32 PM

Date

All new programs (majors, minors, sequences) are routed by the U.C.C. to the Academic Senate