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

Program Department Marketing
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Title of New Program Major in Data Science, Business Analytics Sequence

Submission Date Thursday, January 5, 2023
Email hlmelto@ilstu.edu
Campus Address 5590 Marketing
Version 1 **ID** 423
Proposed Starting Catalog Year 2024-2025

1. Proposed Action

- [ ] New Major
- [ ] New Minor
- [x] New Sequence
- [ ] More than 50% of courses in this program are Distance Education

Sequence Major

Data Science Major

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

Major in Data Science, Business Analytics Sequence

Degree Offered: B.S.

Students in this sequence will gain the knowledge and skills to help businesses use statistical methods and technologies for data analysis to gain new insight and improve strategic decision-making.

Major Requirements

Minimum required credit hours: 76

- BIS 167 - Electronic Spreadsheet Usage (1)
- BIS 271 Introduction to Business Analytics (3)
- ECO 101 Principles of Microeconomics (3)
- ECO 102 Principles of Macroeconomics (3)
- 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)
- MKT 232 Marketing Research (3)
- MKT 245 Introduction to Marketing Analytics (3)

Take one of the following:

- MKT 190 Marketing Fundamentals and Career Choices (3)
- MKT 230 Introduction to Marketing Management (3)

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 (this is the recommended course for students in this sequence) (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)

Take one of the following:

- MKT 310 Marketing, Logistics, and Supply Chain Management (3)
- MKT 345 Advanced Marketing Analytics (3)
- MKT 339A13 Seminar in Marketing: Brand Management and Analytics (3)
- ACC 263 - Accounting Information Systems (3)
- ACC 353 - Forensic Analytics (3)
- BIS 366 - Advanced Business Data Management (3)
- BIS 371 - Intermediate Business Analytics (3)
- MKT 311 - Marketing & Sales Forecasting (3)

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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.

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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 Business Analytics Sequence (118 hours)

First Year – Fall Semester (17 credit hours)

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

First Year – Spring Semester (17 credit hours)

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

BIS 167 (1)

Second Year – Fall Semester (15 credit hours)

MAT 147 (BS-SMT) (4)
MAT 260 (4)
IT 180 (1)
ECO 102 (3)
General Education (3)

Second Year – Spring Semester (16 credit hours)

MAT 350 (4)
IT 279 (3)
General Education (3)
General Education (3)
MKT 190 or MKT 230 (3)

Third Year – Fall Semester (14 credit hours)

MAT 175 (4)
MAT 351 (4)
MKT 232 (3)
BIS 271 (3)

Third Year – Spring Semester (15 credit hours)

IT 348 (3)
MKT 245 (3)
University-wide elective (3)
General Education (3)
MKT 236 (3)

Fourth Year – Fall Semester (12 credit hours)

POL 309, CTK 302, or IT 352 (3)
Business Analytics Sequence elective (3)
University-wide elective (3)
University-wide elective or AMALI (3)

Fourth Year – Spring Semester (13)

MAT 355 (4)
IDS 388 or IDS 398A05(3)
University-wide elective (3) (IDEAS)
General Education (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.

The Data Science Major 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 specializes 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.

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

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 include 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. Marketing Department Curriculum Committee Chair

Duleep Delpechitre (website)	Duleep Delpechitre	1/9/2023 6:37:52 AM
Signature	Print	Date

2. Marketing Department Chair/School Director

Horace Melton (website)	Horace Melton	1/9/2023 9:07:43 AM
Signature	Print	Date

3. Mathematics Department Chair

Gaywalee Yamskulna (website)	Gaywalee Yamskulna	1/9/2023 9:09:00 AM
Signature	Print	Date

4. Health Sciences Department Chair

David Grieshaber (website)	David Grieshaber	1/9/2023 9:09:16 AM
Signature	Print	Date

5. School of Information Technology Department Chair

Traci Carte (website)	Traci Carte	1/9/2023 9:12:34 AM
Signature	Print	Date

6. Politics and Government Department Chair

Thomas McClure (website)	Thomas McClure	1/9/2023 9:21:45 AM
Signature	Print	Date

7. Sociology Department Chair

Joan Brehm (website)	Joan Brehm	1/9/2023 12:03:09 PM
Signature	Print	Date

8. Anthropology Department Chair

Joan Brehm (website)	Joan Brehm	1/9/2023 12:03:26 PM
Signature	Print	Date

9. Accounting Department Chair

Joseph Johnston (website)	Joseph Johnston	1/10/2023 3:04:03 PM
Signature	Print	Date

10. Council on General Education Chair

Gregory Ferrence (website)	Gregory Ferrence	2/9/2023 1:58:05 PM
Signature	Print	Date

11. University Curriculum Committee Chair

Mary Califf (website)	Mary Califf	3/22/2023 5:04:14 PM
Signature	Print	Date

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