

# New Program Proposal

Date Submitted: 03/20/23 6:18 pm

## Viewing: **BS-EDSC : Bachelor of Science in Economics and Data Science**

Last edit: 03/22/23 5:59 pm

Changes proposed by: rcalia

Program Status	Active		
Requestor	Name	Roland Calia	E-mail
	rcalia@stuart.iit.edu		
Origination Date	2023-3-20		
Is this an interdisciplinary program?	No		
Academic Unit	Business Administration		
College	Stuart School of Business		
Program Title	Bachelor of Science in Economics and Data Science		
Effective Academic Year	2023 - 2024	Effective Term	Fall 2023
Academic Level	Undergraduate		
Program Type	Degree		
Degree Type	Bachelor of Science (BS)		
CIP Code			

### In Workflow

1. SB Associate Dean
2. Academic Affairs
3. Undergraduate Academic Affairs
4. Director of Assessment
5. SB Dean
6. Marketing and Communications
7. Undergraduate Studies Committee Chair
8. Faculty Council Chair
9. Faculty Council Chair
10. Provost
11. President
12. Board of Trustees
13. Academic Affairs

### Approval Path

1. 03/20/23 9:01 pm  
M Krishna Erramilli (krish): Approved for SB Associate Dean
2. 03/22/23 6:18 pm  
Patty Johnson Winston (winston): Approved for Academic Affairs
3. 03/23/23 10:33 am  
Joseph Gorzkowski (jgorzkow): Approved for Undergraduate Academic Affairs
4. 03/24/23 3:07 pm  
Lauren Woods (lwoods1): Approved for

Director of  
Assessment  
5. 03/24/23 3:15 pm  
Liad Wagman  
(lwagman):  
Approved for SB  
Dean

45.0603 - Econometrics and Quantitative Economics.

Is there more than one Academic Unit proposer?

No

Program Code            BS-EDSC

Program Attribute

Total Program            126  
Credit Hours

## **Program Narrative and Justification**

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Narrative description of how the institution determined the need for the program. For example, describe what need this program will address and how the institution became aware of that need. If the program is replacing a current program(s), identify the current program(s) that is being replaced by the new program(s) and provide details describing the benefits of the new program(s). If the program will be offered in connection with, or in response to, an initiative by a governmental entity, provide details of that initiative.

This program is part of the undergraduate program incubator.

See [https://docs.google.com/document/d/1e5Mlgsk\\_Fh4CJgkSBxhUjW--KqFrzZa3QMAYNd8uDO0/edit](https://docs.google.com/document/d/1e5Mlgsk_Fh4CJgkSBxhUjW--KqFrzZa3QMAYNd8uDO0/edit)

The Bachelor of Science in Economics and Data Science degree focuses on applying data science concepts in the economics domain. Through the study of economics, students learn how the design of platforms shapes incentives, drives behavior, and determine social and economic outcomes including equity and efficiency. Coursework in data science teaches students how to manage, manipulate, and parse data to extract knowledge and insight. Data science graduates with a grounding in economics can use computational techniques to gain valuable insights from data to predict trends, solve business challenges, and help businesses make more efficient decisions.

Narrative description of how the program was designed to meet local market needs, or for an online program, regional or national market needs. For example, indicate if Bureau of Labor Statistics data or State labor data systems information was used, and/or if State, regional, or local workforce agencies were consulted. Include how the course content, program length, academic level, admission requirements, and prerequisites were decided; including information received from potential employers about course content; and information regarding the target students and employers.

The Bachelor of Science in Economics and Data Science was developed by the Stuart School of Business faculty in consultation with the faculty and leadership of the Department of Data Science in the College of Computing as well as industry experts and practitioners.

Narrative description of any wage analysis the institution may have performed, including any consideration of Bureau of Labor Statistics wage data related to the new program.

A Bachelor of Science in Economics and Data Science degree can provide an excellent preparation for private sector job markets, particular in the technology sector. Students with this degree have a relatively high median salary of approximately \$100,00 according to the Bureau of Labor Statistics. The job outlook is excellent, with job growth projected to increase by 36% over the next 10 years for data science analysts. See <https://www.bls.gov/ooh/math/data-scientists.htm>

Narrative description of how the program was reviewed or approved by, or developed in conjunction with, one or more of the following: a) business advisory committees; b) program integrity boards; c) public or private oversight or regulatory agencies (not including the state licensing/authorization agency and accrediting agency); and d) businesses that would likely employ graduates of the program. For example, describe the steps taken to develop the program, identify when and with whom discussions were held, provide relevant details of any proposals or correspondence generated, and/or describe any process used to evaluate the program.

The Bachelor of Science in Economics and Data Science was developed by the Stuart School of Business faculty in consultation with the faculty and leadership of the Department of Data Science in the College of Computing as well as industry experts and practitioners.

What are the enrollment estimates?

Year 1	5	Year 2	10	Year 3	15
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Attach Additional  
Program  
Justification  
Document(s)

## Academic Information

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### Advising

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Since quality advising is a key component of good retention, graduation, and career placement, how will students be mentored? What student professional organizations will be formed? How will the department work with the Career Services office to develop industry connections?

Students will be primarily advised by the Stuart Undergraduate Program Director with the assistance of a designated advisor in the Department of Data Science.

### Program Resources

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Which program resources are necessary to offer this program?

Personnel  
Facilities

Describe the personnel requirements necessary to offer the program. Describe how and when resources will be made available to hire any additional personnel that are required.

No new personnel are required.

Describe the facilities requirements necessary to offer the program. Describe how and when resources will be made available to obtain any additional facilities that are required.

No new facilities are required.

### Proposed Bulletin Entry

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Admission  
Requirements

The Bachelor of Science in Economics and Data Science degree focuses on applying data science concepts in the economics domain. Through the study of economics, students learn how the design of platforms shapes incentives, drives behavior, and determine social and economic outcomes including equity and efficiency. Coursework in data science teaches students how to manage, manipulate, and parse data to extract knowledge and insight. Data science graduates with a grounding in economics can use computational techniques to gain valuable insights from data to predict trends, solve business challenges, and help businesses make more efficient decisions.

Course Requirements

Economics Required Courses		(42)
<a href="#"><u>BUS 100</u></a>	Introduction to Business and Economics	3
<a href="#"><u>BUS 102</u></a>	Computing Tools for Business Analysis	3
<a href="#"><u>BUS 221</u></a>	Business Statistics	3
<a href="#"><u>BUS 321</u></a>	Optimization and Decision-Making	3
<a href="#"><u>BUS 480</u></a>	Strategic Management and Design Thinking	3
<a href="#"><u>ECON 151</u></a>	Microeconomics	3
<a href="#"><u>ECON 152</u></a>	Macroeconomics	3

<a href="#"><u>ECON 311</u></a>	Intermediate Microeconomics	3
<a href="#"><u>ECON 312</u></a>	Intermediate Macroeconomics	3
<a href="#"><u>ECON 382</u></a>	Business Economics	3
<a href="#"><u>ECON 423</u></a>	Economics of Capital Investments	3
Economics Elective - Choose three courses		9
<a href="#"><u>BUS 210</u></a>	Introduction to Accounting	3
<a href="#"><u>BUS 211</u></a>	Financial Accounting	3
<a href="#"><u>BUS 212</u></a>	Managerial Accounting	3
<a href="#"><u>BUS 301</u></a>	Organizational Behavior	3
<a href="#"><u>BUS 305</u></a>	Operation and Supply Chain Design	3
<a href="#"><u>BUS 311</u></a>	Strategic Cost Management	3
<a href="#"><u>BUS 341</u></a>	Business Law	3
<a href="#"><u>BUS 361</u></a>	Entrepreneurship	3
<a href="#"><u>BUS 371</u></a>	Marketing Fundamentals	3
<a href="#"><u>BUS 452</u></a>	International Finance	3
<a href="#"><u>BUS 454</u></a>	Investments	3
<a href="#"><u>BUS 455</u></a>	Corporate Finance	3
<a href="#"><u>BUS 457</u></a>	Financial Modeling	3
<a href="#"><u>BUS 458</u></a>	Financial Derivatives	3
<a href="#"><u>BUS 472</u></a>	New Product Development	3
<a href="#"><u>BUS 473</u></a>	Marketing Research	3
<a href="#"><u>BUS 475</u></a>	Sales Management	3
<a href="#"><u>BUS 476</u></a>	Consumer Behavior	3
<a href="#"><u>ECON 383</u></a>	Sports Economics	
Data Science Required Courses		(24)
<a href="#"><u>DS 151</u></a>	Introduction to Data Science	3
<a href="#"><u>ECON 251</u></a>	Introduction to Econometrics	3
<a href="#"><u>MATH 332</u></a>	Elementary Linear Algebra	3
<a href="#"><u>MATH 474</u></a>	Probability and Statistics	3
Data Science Electives - Choose four courses		12
<a href="#"><u>CS 484</u></a>	Introduction to Machine Learning	3
<a href="#"><u>DS 251</u></a>	Mathematical Foundations for Data Science I	3
<a href="#"><u>DS 261</u></a>	Ethics and Privacy in Data Science	3
<a href="#"><u>DS 351</u></a>	Mathematical Foundations for Data Science II	
<a href="#"><u>DS 451</u></a>	Data Science Life Cycle	3
<a href="#"><u>MATH 350</u></a>	Introduction to Computational Mathematics	3
<a href="#"><u>MATH 435</u></a>	Linear Optimization	3
<a href="#"><u>MATH 446</u></a>	Introduction to Time Series	3
<a href="#"><u>MATH 569</u></a>	Statistical Learning	3
<a href="#"><u>MATH 574</u></a>	Bayesian Computational Statistics	3
<a href="#"><u>PSYC 204</u></a>	Research Methods in Behavioral Science	4
Mathematics Requirements		(14)
<a href="#"><u>MATH 151</u></a>	Calculus I	5
<a href="#"><u>MATH 152</u></a>	Calculus II	5
<a href="#"><u>MATH 251</u></a>	Multivariate and Vector Calculus	4
Computer Science Requirements		(4)
<a href="#"><u>CS 115</u></a>	Object-Oriented Programming I	2

<a href="#"><u>CS 116</u></a>	Object-Oriented Programming II	2
	Natural Science and Engineering Requirements	(10)
<a href="#"><u>See Illinois Tech Core Curriculum, section D</u></a>		10
	Interprofessional Projects (IPRO)	(6)
<a href="#"><u>See Illinois Tech Core Curriculum, section E</u></a>		6
	Humanities and Social Science Requirements	(26)
<a href="#"><u>See Illinois Tech Core Curriculum, section B and C</u></a>		21
	Free Electives	5
	Total Credit Hours	126

Sample  
Curriculum/Program  
Requirements

		Year 1	
Semester 1	Credit Hours	Semester 2	Credit Hours
<a href="#"><u>BUS 100</u></a>	3	<a href="#"><u>BUS 102</u></a>	3
<a href="#"><u>ECON 151</u></a>	3	<a href="#"><u>ECON 152</u></a>	3
<a href="#"><u>CS 115</u></a>	2	<a href="#"><u>CS 116</u></a>	2
Humanities Elective (200 Level)	3	<a href="#"><u>MATH 152</u></a>	5
<a href="#"><u>MATH 151</u></a>	5	Science Elective	4
	16		17

		Year 2	
Semester 1	Credit Hours	Semester 2	Credit Hours
<a href="#"><u>BUS 321</u></a>	3	<a href="#"><u>BUS 221</u></a>	3
<a href="#"><u>ECON 311</u></a>	3	<a href="#"><u>ECON 312</u></a>	3
<a href="#"><u>DS 151</u></a>	3	<a href="#"><u>MATH 332</u></a>	3
<a href="#"><u>MATH 251</u></a>	4	Humanities Elective (300+)	3
Science Elective	3	Science Elective	3
	16		15

		Year 3	
Semester 1	Credit Hours	Semester 2	Credit Hours
<a href="#"><u>ECON 251</u></a>	3	<a href="#"><u>ECON 382</u></a>	3
<a href="#"><u>MATH 474</u></a>	3	Economics Elective	3
Data Science Elective	3	Data Science Elective	3
Humanities Elective (300+)	3	IPRO Elective I	3
Social Science Elective	3	Free Elective	3
	15		15

		Year 4	
Semester 1	Credit Hours	Semester 2	Credit Hours
<a href="#"><u>ECON 423</u></a>	3	<a href="#"><u>BUS 480</u></a>	3
Economics Elective	3	Economics Elective	3
Data Science Elective	3	Data Science Elective	3
IPRO Elective II	3	Humanities or Social Science Elective	3

Social Science Elective (300+)	3	Social Science Elective (300+)	3
Free Elective	2		
	17		15

Total Credit Hours: 126

Specialization  
Requirements

## Program Outcomes and Assessment Process

What are the learning goals for this program?

Learning goal	Courses/student work used to assess achievement of this goal
SSB Common Goal 1 a: Oral Communications Skills Students will prepare and deliver oral presentations that are well-structured, technically competent and make good use of aids to support evidence-driven conclusions.	BUS 305
SSB Common Goal 1 b: Written Communications Skills Students will prepare documents in text-based media that are clear, accurate, and appropriate for the intended audience	
SSB Common Goal 2: Critical Thinking Skills Students will analyze and critique presented arguments as well as develop well-reasoned arguments that are supported by arguments..	BUS 480
BSBA Analytical Skills - Graduates will possess the analytical skills to support business decision making.	ECON 382
BE Application of Business Principles	BUS 321
DS Assess and Analyze Data	DS 151

In what semesters will the data be collected to assess this learning goal, and by whom?

Each semester in which program courses are offered.

Provide the name of the rubric that will be used to assess the extent to which students are achieving this learning goal.

See above

How often and by whom will the data be analyzed? What benchmarks or targets will be used to interpret your results?

Each semester. The data will be analyzed by assigned faculty evaluators. Benchmarks are set by faculty.

Briefly describe the process that will be used to share the results with faculty and use these to motivate program improvement.

The Program Director meets with faculty on a regular basis to evaluate results of evaluations and to develop improvement programs. Students have access to IIT Career Center as well as Stuart Career Management Center services.

Attach Additional Assessment Document(s)

[Data Science Assess and Analyze Data.docx](#)

[Application of Business Principles.xlsx](#)

[BUS Analytical Skills.xlsx](#)

[SSBCommonCriticalThinkingFinal.xls](#)

[SSBCommonCommunication Final.xls](#)

## **Undergraduate Program Requirements**

### **Undergraduate Degree Requirements**

Minimum credit hours      126



Specialization

required?

No

Minor required?

No

## Proposed General Curriculum

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List Major Course

Requirements

### Economics Required Courses

<a href="#">BUS 100</a>	Introduction to Business and Economics	3
<a href="#">BUS 102</a>	Computing Tools for Business Analysis	3
<a href="#">BUS 221</a>	Business Statistics	3
<a href="#">BUS 321</a>	Optimization and Decision-Making	3
<a href="#">BUS 480</a>	Strategic Management and Design Thinking	3
<a href="#">ECON 151</a>	Microeconomics	3
<a href="#">ECON 152</a>	Macroeconomics	3
<a href="#">ECON 311</a>	Intermediate Microeconomics	3
<a href="#">ECON 312</a>	Intermediate Macroeconomics	3
<a href="#">ECON 382</a>	Business Economics	3
<a href="#">ECON 423</a>	Economics of Capital Investments	3

### Data Science Required Courses

<a href="#">DS 151</a>	Introduction to Data Science	3
<a href="#">ECON 251</a>	Introduction to Econometrics	3
<a href="#">MATH 332</a>	Elementary Linear Algebra	3
<a href="#">MATH 474</a>	Probability and Statistics	3

Total Credit Hours 45

List Mathematics

Requirements

### Mathematics Requirements

<a href="#">MATH 151</a>	Calculus I	5
<a href="#">MATH 152</a>	Calculus II	5
<a href="#">MATH 251</a>	Multivariate and Vector Calculus	4

Total Credit Hours 14

List Science

Requirements

### Natural Science and Engineering Requirements

[See Illinois Tech Core Curriculum, section D](#) 10

Total Credit Hours 10

List Computer

Science

Requirements

### Computer Science Requirements

[CS 115](#) Object-Oriented Programming I 2

<a href="#">CS 116</a>	Object-Oriented Programming II	2
Total Credit Hours		4
List Humanities and Social Sciences Requirements		
Humanities and Social Science Requirements		
<a href="#">See Illinois Tech Core Curriculum, section B and C</a>		21
Total Credit Hours		21
List Interprofessional Project (IPRO) Requirements		
Interprofessional Projects (IPRO)		
<a href="#">See Illinois Tech Core Curriculum, section E</a>		6
Total Credit Hours		6
List Technical Elective Course Options		
Economics Electives - Choose three courses		9
<a href="#">BUS 210</a>	Introduction to Accounting	3
<a href="#">BUS 211</a>	Financial Accounting	3
<a href="#">BUS 212</a>	Managerial Accounting	3
<a href="#">BUS 301</a>	Organizational Behavior	3
<a href="#">BUS 302</a>	The Business of Sports	
<a href="#">BUS 305</a>	Operation and Supply Chain Design	3
<a href="#">BUS 311</a>	Strategic Cost Management	3
<a href="#">BUS 341</a>	Business Law	3
<a href="#">BUS 361</a>	Entrepreneurship	3
<a href="#">BUS 371</a>	Marketing Fundamentals	3
<a href="#">BUS 452</a>	International Finance	3
<a href="#">BUS 454</a>	Investments	3
<a href="#">BUS 458</a>	Financial Derivatives	3
<a href="#">BUS 472</a>	New Product Development	3
<a href="#">BUS 473</a>	Marketing Research	3
<a href="#">BUS 475</a>	Sales Management	3
<a href="#">BUS 476</a>	Consumer Behavior	3
<a href="#">BUS 455</a>	Corporate Finance	3
Data Science Electives - Choose 4 courses		12
<a href="#">CS 484</a>	Introduction to Machine Learning	
<a href="#">DS 251</a>	Mathematical Foundations for Data Science I	
<a href="#">DS 261</a>	Ethics and Privacy in Data Science	
<a href="#">DS 351</a>	Mathematical Foundations for Data Science II	
<a href="#">DS 451</a>	Data Science Life Cycle	
<a href="#">MATH 350</a>	Introduction to Computational Mathematics	3
<a href="#">MATH 435</a>	Linear Optimization	3
<a href="#">MATH 446</a>	Introduction to Time Series	3

<a href="#">MATH 569</a>	Statistical Learning		3
<a href="#">MATH 574</a>	Bayesian Computational Statistics		3
<a href="#">PSYC 204</a>	Research Methods in Behavioral Science		4
Total Credit Hours			21
List Free Elective Credit Hours (if applicable)	5		
Semester-by-semester plan of study for the degree program			
			Year 1
Semester 1	Credit Hours	Semester 2	Credit Hours
<a href="#">BUS 100</a>	3	<a href="#">BUS 102</a>	3
<a href="#">ECON 151</a>	3	<a href="#">ECON 152</a>	3
<a href="#">CS 115</a>	2	<a href="#">CS 116</a>	2
Humanities Elective (200 Level)	3	<a href="#">MATH 152</a>	5
<a href="#">MATH 151</a>	5	Science Elective	4
	16		17
			Year 2
Semester 1	Credit Hours	Semester 2	Credit Hours
<a href="#">BUS 321</a>	3	<a href="#">BUS 221</a>	3
<a href="#">ECON 311</a>	3	<a href="#">ECON 312</a>	3
<a href="#">DS 151</a>	3	<a href="#">MATH 332</a>	3
<a href="#">MATH 251</a>	4	Humanities Elective (300+)	3
Science Elective	3	Science Elective	3
	16		15
			Year 3
Semester 1	Credit Hours	Semester 2	Credit Hours
<a href="#">ECON 251</a>	3	<a href="#">ECON 382</a>	3
<a href="#">MATH 474</a>	3	Economics Elective	3
Data Science Elective	3	Data Science Elective	3
Humanities Elective (300+)	3	IPRO Elective I	3
Social Science Elective	3	Free Elective	3
	15		15
			Year 4
Semester 1	Credit Hours	Semester 2	Credit Hours
<a href="#">ECON 423</a>	3	<a href="#">BUS 480</a>	3
Economics Elective	3	Economics Elective	3
Data Science Elective	3	Data Science Elective	3
IPRO Elective II	3	Humanities or Social Science Elective	3

Social Science Elective (300+)	3	Social Science Elective (300+)	3
Free Elective	2		
	17		15
Total Credit Hours: 126			

Reviewer  
Comments