# : INFORMATION SCIENCES + DATA SCIENCES, BS

## In Workflow

1. U Program Review (dforgacs@illinois.edu; eastuby@illinois.edu; aledward@illinois.edu)
2. 1992 Head (knox@illinois.edu)
3. 1257 Head (tyson@illinois.edu)
4. 1434 Head (namato@illinois.edu; vmahesh@illinois.edu; egunter@illinois.edu)
5. 1583 Head (libo@illinois.edu)
6. KM Committee Chair (josephm@illinois.edu)
7. KP Committee Chair (bsnewell@illinois.edu; danko@illinois.edu; kcp@illinois.edu; jmakela@illinois.edu)
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10. LP Dean (knox@illinois.edu)
11. University Librarian (jpwilkin@illinois.edu)
12. Provost (kmartens@illinois.edu)
13. Senate EPC (bjlehman@illinois.edu; moorhouz@illinois.edu; kmartens@illinois.edu)
14. Senate (jtempel@illinois.edu)
15. U Senate Conf (none)
16. Board of Trustees (none)
17. IBHE (none)
18. DMI (eastuby@illinois.edu; aledward@illinois.edu; dforgacs@illinois.edu)

## Approval Path

1. Thu, 01 Apr 2021 16:47:08 GMT
   Deb Forgacs (dforgacs): Approved for U Program Review
2. Thu, 01 Apr 2021 16:49:05 GMT
   Emily Knox (knox): Approved for 1992 Head
3. Thu, 01 Apr 2021 16:51:31 GMT
   Jeremy Tyson (tyson): Approved for 1257 Head
4. Fri, 02 Apr 2021 20:12:26 GMT
   Elsa Gunter (egunter): Approved for 1434 Head
5. Fri, 02 Apr 2021 20:40:12 GMT
   Bo Li (libo): Approved for 1583 Head
6. Sat, 10 Apr 2021 01:04:53 GMT
   Joseph Mahoney (josephm): Approved for KM Committee Chair
7. Tue, 13 Apr 2021 17:37:33 GMT
   Brooke Newell (bsnewell): Approved for KP Committee Chair
8. Tue, 13 Apr 2021 17:39:24 GMT
   Candy Deaville (candyd): Approved for KP Dean
9. Tue, 13 Apr 2021 17:40:55 GMT
   Kelly Ritter (ritterk): Approved for KV Dean
10. Tue, 13 Apr 2021 18:33:44 GMT
    Emily Knox (knox): Approved for LP Dean
11. Tue, 13 Apr 2021 18:35:23 GMT
    John Wilkin (jpwilkin): Approved for University Librarian
12. Tue, 13 Apr 2021 18:50:31 GMT
    Kathy Martensen (kmartens): Approved for Provost

## New Proposal

Date Submitted:Thu, 01 Apr 2021 14:54:05 GMT

## Viewing:: Information Sciences + Data Sciences, BS

Changes proposed by: Dustin Janes

## Proposal Type

**Proposal Type:**

Major (ex. Special Education)

Proposal Title:

**If this proposal is one piece of a multi-element change please include the other impacted programs here.***example: A BS revision with multiple concentration revisions*

Establish the Bachelor of Science in Information Sciences + Data Sciences (IS + DS)

**EP Control Number**

EP.21.130

**Official Program Name**

Information Sciences + Data Sciences, BS

**Effective Catalog Term**

Fall 2022

**Sponsor College**

Information Science, School of

**Sponsor Department**

Information Sciences

**Sponsor Name**

Jana Diesner

**Sponsor Email**

jdiesner@illinois.edu

**College Contact**

Emily Knox

**College Contact Email**

knox@illinois.edu

# Program Description and Justification

**Provide a *brief* description and justification of the program, including highlights of the program objectives, and the careers, occupations, or further educational opportunities for which the program will prepare graduates, when appropriate.**

PROGRAM DESCRIPTION:
A degree plan incorporating simultaneously deep engagement with Information Sciences and a strong foundation in data science, including substantial research and discovery experiences as part of the degree. The degree is comprised of three different components:

1. The data science core coursework (28-31 hours)
a. This coursework is comprised of:
i. Two (2) courses hosted primarily by Statistics
ii. Two (2) courses hosted primarily by Computer Science
iii. Two (2) courses hosted primarily by the iSchool
iv. Two (2) courses hosted primarily by Mathematics
2. The coursework in Information Sciences (approx. 24-30 hours)
3. An independent plan of study to contain one or more meaningful research discovery experiences (at least 6 hours)

JUSTIFICATION:
The Information Sciences take a human-centered perspective on the building and deployment of systems for information management. At the core of this perspective is:
- understanding the ethical, social, policy, and governance implications of how information is collected, managed, used, and shared;
- studying how human, social, organizational, and cultural factors interact with technical factors to determine what information is collected, how information is managed and the implications for its quality and accessibility, how prospective users of information search and retrieve information, and whether and how prospective users of information systems choose to use these systems;
- developing and applying methods for building information management systems that meet the needs of users, organizations, and of society more broadly.

To support and advance the iSchool's human-centered perspective, its faculty includes experts in data science, AI, data curation, database design, digital libraries, human-computer interaction, human information behavior, information and data ethics and policy, information organization, information privacy and security, information retrieval, interface design, and social computing.

Organizations in the private sector, non-profit sector, local and national government, academia, and other sectors are employing data science approaches across the full range of their activities. These organizations are increasingly recognizing human-centered aspects of data science as critical to improve stakeholder satisfaction and organizational efficiency, to proactively anticipate and mitigate potential harm to data subjects, and to ensure fairness and equitable access to services and products.

**Corresponding Degree**

BS Bachelor of Science

**Is this program interdisciplinary?**

Yes

**Interdisciplinary Colleges and Departments (list other colleges/departments which are involved other than the sponsor chose above)**

In Spring 2017, the College of Liberal Arts & Sciences submitted an Investment for Growth Proposal to "Jump Start Data Science", focusing on undergraduate data science education. Interim Provost John Wilkin supported the proposal, but called on LAS to work with three colleges (Engineering, the iSchool, and the Gies College of Business) to develop a collaborative approach to undergraduate data science at Illinois. Those deans formed a task force (herein the "Data Science Education Task Force" or DSETF) to explore opportunities and make proposals for undergraduate data science education at Illinois. The DSETF conducted its work during academic years 2017—2018 and 2018—2019. At the core of their work was the vision that every Illinois undergraduate should have the opportunity to have a meaningful exposure to data science.

This proposal builds on the University-wide initiative discussed above, which seeks to expand the Data Science vision for Illinois to every department, through a model of "X+DS" programs hosted in the department of the specialization ("X"). This proposal is just one of many, submitted as a group, which has the full support of the Data Science Education Task Force and the Data Science Education committee, and integrates a solid core of data science courses from LAS, CS and the School of Information Sciences (iSchool) to this "X" major.

**College**

Liberal Arts & Sciences

**Department**

Mathematics

**Do you need to add an additional interdisciplinary relationship?**

Yes

**College**

Gies College of Business

**Department**

Gies BUS Admin

**Do you need to add an additional interdisciplinary relationship?**

Yes

**College**

Grainger College of Engineering

**Department**

Computer Science

**Do you need to add an additional interdisciplinary relationship?**

Yes

**College**

Liberal Arts & Sciences

**Department**

Statistics

**Academic Level**

Undergraduate

**Will you admit to the concentration directly?**

Yes

**Is a concentration required for graduation?**

No

**CIP Code**

307001 - Data Science, General.

**Is This a Teacher Certification Program?**

No

**Will specialized accreditation be sought for this program?**

No

# Institutional Context

University of Illinois at Urbana-Champaign

Describe the historical and university context of the program's development. Include a short summary of any existing program(s) upon which this program will be built.

**Explain the nature and degree of overlap with existing programs and, if such overlap exists, document consultation with the impacted program's home department(s).**

In response to the university's strategic plan and in recognition of the interdisciplinary and outward-looking nature of data science, the Departments of Computer Science, Mathematics, Statistics, the Gies College of Business, and the iSchool collaborated to develop a framework for X+Data Science majors, enabling students to learn the principles of data science while engaging deeply with a variety of subject matters in Information Sciences. Computer Science, Mathematics, Statistics, and the iSchool are offering a core framework of courses and advising in data science; the iSchool offers coursework and advising in Information Sciences; and the program provides coursework and independent work/research experiences that brings Information Sciences and data science together.

While our existing BS/IS prepares undergraduates for a wide range of roles in the information professions, allowing students to integrate interdisciplinary education in data science alongside an IS major will enable them to bring human-centered perspectives more fully to bear on addressing the challenges and exploiting the opportunities of data science approaches.

University of Illinois

**Briefly describe how this program will support the University's mission, focus and/or current priorities. Demonstrate the program's consistency with and centrality to that mission.**

The IS+DS program will serve the university's educational mission by preparing students to collaborate, communicate, and work effectively and ethically in a data-rich and interdisciplinary work environment. The X + DS degrees together encompass the full set of knowledge and skills that would position Illinois as a whole to provide DS education aligned with the current national recommendations for DS undergraduate education and the mission of our public land-grant institution, i.e., to "produce alumni who desire to make a significant, societal impact."

State of Illinois

**Indicate which of the following goals of the Illinois Board of Higher Education's Strategic Initiative are supported by this program: (choose all that apply)**

Educational Attainment - increase educational attainment to match the best-performing states.
High Quality Credentials to Meet Economic Demand - Increase the number of high-quality post-secondary credentials to meet the demands of the economy and an increasingly global society.
Integration of Educational, Research and Innovation Assets - Better integrate Illinois' educational, research and innovation assets to meet economic needs of the state and its regions.

**Describe how the proposed program supports these goals.**

The ubiquity of many different types of data sets has created enormous demand for data scientists across many domains of economic activity. Enrollment in the Statistics major has increased six-fold in the last ten years, and other majors that involve data science have seen similar explosion in interest. There is also demand for data scientists who can work collaboratively in application domains.

In the private sector, the demand for data science professionals is growing at a rapid pace. A 2017 report by PricewaterhouseCoopers and Business-Higher Education Forum stated 69% of employers surveyed expressed a desire for job applicants skilled in data science and analytics, with job openings expected to rise to 2.7 million roles by 2020. The report found that the demand for candidates with data science and analytics skills was greatest "in finance and insurance, information technology, and professional, scientific, and technical services."

The goal of this joint effort is to enable every unit with an existing undergraduate program to flexibly adapt and further develop a curriculum that combines and integrates data acumen with domain knowledge and skills.

# Admission Requirements

**Desired Effective Admissions Term**

Fall 2021

**Provide a brief narrative description of the admission requirements for this program. Where relevant, include information about licensure requirements, student background checks, GRE and TOEFL scores, and admission requirements for transfer students.**

Applicants are admitted in the fall and spring semesters.

Admission Requirements for Freshmen:

• The general admission requirements of the University apply
• Consideration is also given to computer skills
• Application fee
• Self-reported academic record (SRAR)
• Official test scores – Standardized test scores are required for admission review: either ACT (code 1154) or SAT I (code 1836) scores are accepted
• English proficiency
o International students must score at least 620 on the paper-based Test of English as a Foreign Language (TOEFL) (260 on the computer-based test; 104 on the iBT version); or 7 on each section of the IELTS.
For more detailed information regarding application requirements and the application process, please visit the University of Illinois Admissions website at: www.admissions.illinois.edu.

Admission Requirements for Inter-College Transfer Students (ICT):
• Current University students should demonstrate interest in the major by earning a B or better in introductory courses such as IS 101, 202, 203, 205, or 206
• Cumulative minimum GPA of 2.50 or higher
• Successful completion of the application process for entry

Admission Requirements for Transfer Students:

Students seeking to transfer from another university may apply early in the spring semester provided they will have completed at least 30 transferable hours by the end of the spring semester. Hours planned during upcoming summer semesters are not considered. Forms are available from the University Office of Admissions and Records.

**Describe how critical academic functions such as admissions and student advising are managed.**

Admissions and student advising are managed by using our current systems and personnel. As the iSchool currently has a data analytics/data science pathway in the BS/IS, no increases in staffing needs are anticipated.

## Enrollment

**Number of Students in Program (estimate)**

**Year One Estimate**

50

**5th Year Estimate (or when fully implemented)**

100

**Estimated Annual Number of Degrees Awarded**

**Year One Estimate**

10

**5th Year Estimate (or when fully implemented)**

25

**What is the matriculation term for this program?**

Fall

**What is the typical time to completion of this program?**

4 years

**What are the minimum Total Credit Hours required for this program?**

120

## Delivery Method

**This program is available:**

On Campus

## Budget

**Will the program or revision require staffing (faculty, advisors, etc.) beyond what is currently available?**

No

**Additional Budget Information**

This is a revision of an existing degree program to partner with a data science component, and for the most part involves merely a shift in enrollments of courses taken within the units already. New courses largely shift enrollments away from existing courses (e.g., STAT 100 and CS 105 # STAT/CS/IS 107; STAT 200 + STAT 212 # STAT 207; MATH 225 # MATH 227 and/or MATH 257; etc.).

Students in the Information Sciences + Data Science program will be charged the tuition rate for the iSchool's BS/IS program.

## Resource Implications

Facilities

**Will the program require new or additional facilities or significant improvements to already existing facilities?**

No

Technology

**Will the program need additional technology beyond what is currently available for the unit?**

No

Non-Technical Resources

**Will the program require additional supplies, services or equipment (non-technical)?**

No

## Resources

**For each of these items, be sure to include in the response if the proposed new program or change will result in replacement of another program(s). If so, which program(s), what is the anticipated impact on faculty, students, and instructional resources? Please attach any letters of support/ acknowledgement from faculty, students, and/or other impacted units as appropriate.**

**Attach File(s)**

CS-Support-for-Four-X+Data-Science-Proposals2021-03-04.pdf
X + DS Support Letter - iSchool.docx
STAT-Support-4X+DS Letter.pdf
Math-Support-for-Four-X+Data-Science-Proposals2021-03-08.pdf

Faculty Resources

**Please address the impact on faculty resources including any changes in numbers of faculty, class size, teaching loads, student-faculty ratios, etc. Describe how the unit will support student advising, including job placement and/or admission to advanced studies.**

No changes in number of faculty is needed. Existing classes have the capacity to absorb any additional students. The iSchool has two undergraduate advisors and a career services office who will advise students in this program.

Library Resources

**Describe your proposal's impact on the University Library's resources, collections, and services. If necessary please consult with the appropriate disciplinary specialist within the University Library.**

None.

Instructional Resources

**Will there be any reduction in other course offerings, programs or concentrations by your department as a result of this new program/proposed change?**

No

**Does the program include other courses/subjects impacted by the creation/revision of this program?**

No

# Financial Resources

**How does the unit intend to financially support this proposal?**

This proposal involves only a shift in enrollments of courses taken within the units already. New courses largely shift enrollments away from existing courses (e.g., STAT 100 and CS 105 - STAT/CS/IS 107; TAT 200 + STAT 212 - STAT 207; MATH 225 - MATH 277; etc.). Each affected unit can shift teaching resources to the extent necessary. Students in the IS + DS will be charged the tuition rate for the B.S. in Information Sciences.

**Will the unit need to seek campus or other external resources?**

No

**Are you seeking a change in the tuition rate or differential for this program?**

Yes

**If yes, please enter your college budget office contact information and have them contact provostbudget@illinois.edu for next steps.**

The BS/IS has an approved tuition differential and students in the IS + DS will be charged the same rate: https://cost.illinois.edu/Home/UgradBase?DiffCode=LIS&TermCode=120208&TableType=1

## Market Demand

**What market indicators are driving this proposal? If similar programs exist in the state, describe how this program offers a unique opportunity for students:**

The ubiquity of many different types of data sets has created enormous demand for data scientists across many domains of economic activity. Enrollment in the Statistics major has increased six-fold in the last ten years, and other majors that involve data science have seen similar explosion in interest. There is also demand for data scientists who can work collaboratively in application domains.

**What type of employment outlook should these graduates expect? Explain how the program will meet the needs of regional and state employers, including any state agencies, industries, research centers, or other educational institutions that expressly encourage the program's development.**

In the private sector, the demand for data science professionals is growing at a rapid pace. A 2017 report by PricewaterhouseCoopers and Business-Higher Education Forum stated 69% of employers surveyed expressed a desire for job applicants skilled in data science and analytics, with job openings expected to rise to 2.7 million roles by 2020 . The report found that the demand for candidates with data science and analytics skills was greatest "in finance and insurance, information technology, and professional, scientific, and technical services."

**What resources will be provided to assist students with job placement?**

The School of Information Sciences has two full-time dedicated staff members devoted to student success, who collaborate across campus to leverage resources and deliver career support to students. These include multiple career services platforms and programs to facilitate career readiness, job search strategy coaching, mentoring, an iSchool career fair, employer site visits, individual counseling and practicum opportunities.

## Program Regulation and Assessment

**Briefly describe the plan to assess and improve student learning, including the program's learning objectives; when, how, and where these learning objectives will be assessed; what metrics will be used to signify student's achievement of the stated learning objectives; and the process to ensure assessment results are used to improve student learning. (Describe how the program is aligned with or meets licensure, certification, and/or entitlement requirements, if applicable).**

The methods for program regulation and assessment for the IS + DS will be the same as the BS/IS. The program learning outcomes for the BS/IS are are:
Understand relationships among people, information, and technology
• Understand the history, theory, philosophy and methodologies of the field of information
sciences
• Apply various approaches to research in the information sciences, including social science
methods, data and text mining, digital humanities, historical approaches, and others
• Apply critical analytical skills to information issues
• Understand fundamental mathematical and programming tools for solving problems of
information modeling, expression, and transformation

In addition the IS + DS has an additional learning outcome:
Understand the data life cycle and be able to analyze, interpret, explain, qualify, and contextualize data at scale

The BS/IS Program Director, with support from the School of Information Sciences Education Data Analyst, will collect data on both student learning outcomes and student success in the program. Evaluation will be based on review of course assessment, self-evaluation surveys, and placement data. In keeping with C-LOA requirements, there will be a three-year evaluation timeline.

**Is the career/profession for graduates of this program regulated by the State of Illinois?**

No

# Program of Study

"Baccalaureate degree requires at least 120 semester credit hours or 180 quarter credit hours and at least 40 semester credit hours (60 quarter credit hours) in upper division courses" (source: https://www.ibhe.org/assets/files/PrivateAdminRules2017.pdf). For proposals for new bachelor's degrees, if this minimum is not explicitly met by specifically-required 300- and/or 400-level courses, please provide information on how the upper-division hours requirement will be satisfied.

**All proposals must attach the new or revised version of the Academic Catalog program of study entry. Contact your college office if you have questions.**

**For new programs, attach Program of Study**

iSchool IS + DS Statement for Programs of Study.docx

Catalog Page Text

**Catalog Page Text: Description of program for the catalog page. This is not official content, it is used to help build the catalog pages for the program. Can be edited in the catalog by the college or department.**

The major prepares students for professional or graduate work in the Information Sciences, and for applications in which knowledge of data processing and management is particularly important.

For the Degree of Bachelor of Science in Information Sciences
Major in Information Sciences + Data Science

E-mail: ischool-is@illinois.edu

General education: Students must complete the Campus General Education requirements including the campus general education language requirement.

Twelve hours of 300 and 400-level courses must be taken on this campus.

Minimum hours required for graduation: 120 hours

Departmental distinction: To graduate with distinction requires a specified minimum grade point average in all Computer Science, Statistics, Information Sciences, and Mathematics courses listed below. A GPA of 3.25 is required for Distinction, 3.5 for High Distinction, and 3.75 for Highest Distinction.

This major is sponsored jointly by the School of Information Sciences (iSchool), and the Departments of Statistics, Computer Science, and Mathematics. The major prepares students for professional or graduate work in the Information Sciences, and for applications in which knowledge of data processing and management is particularly important.

**Statement for Programs of Study Catalog**

**General education:Students must complete the** Campus General Education (https://courses.illinois.edu/gened/DEFAULT/DEFAULT/)**requirements.**

## Data Science Core

| Code | Title | Hours |
| --- | --- | --- |
| **Total Hours** | | **28-31** |
| **Mathematical Foundations** | | **7-8** |
| MATH 220 | Calculus | 4-5 |
| or MATH 221 | Calculus I | |
| or MATH 234 | Calculus for Business I | |
| MATH 227 | Linear Algebra for Data Science | 3 |

| | | |
|---|---|---|
| or MATH 257 | Linear Algebra with Computational Applications | |
| **Data Science Fundamentals** | | **12** |
| STAT/CS/IS 107 | Data Science Discovery | 4 |
| STAT 207 | Data Science Exploration | 4 |
| CS 307 | Modeling and Learning in Data Science | 4 |
| **Computational Fundamentals** | | **4** |
| CS 277 | Algorithms and Data Structures for Data Science | 4 |
| **Social Impact in Data Science** | | **6** |
| IS 467 | Ethics and Policy for Data Science | 3 |
| IS 477 | Data Management, Curation & Reproducibility | 3 |

## Information Sciences Core

| Code | Title | Hours |
|---|---|---|
| **Total Hours** | | **61** |
| IS 101 | Introduction to Information Sciences | 3 |
| IS 202 | Social Aspects Info Tech | 3 |
| IS 204 | Research Design for Information Sciences | 3 |
| IS 205 | Programming for Information Problems | 3 |
| IS 206 | Introduction to Database Concepts & Applications | 3 |
| IS 308 | Race, Gender, and Information Technology | 3 |
| or IS 309 | Computers and Culture | |
| or IS 310 | Computing in the Humanities | |
| or IS 311 | History and Foundations of the Information Society | |
| School of Information Sciences Electives or approved courses in other departments[1] | | 43 |

## Meaningful Research or Discovery Experience

| Code | Title | Hours |
|---|---|---|
| **Total Hours** | | **6** |
| One of the most important skills a student will gain in a IS+DS degree will be the ability to present data in meaningful ways. A research or discovery experience is as much a pillar of this degree program as both the data science core coursework (Part 1) and the coursework in Information Sciences. | | |
| IS 189 | Independent Study[2] | 0 to 3 |

## Summary of Total Hours

| Code | Title | Hours |
|---|---|---|
| Total General Education Hours | | 25 |
| Total Data Science Core Hours | | 28 |
| Total Information Science Specialization Hours | | 61 |
| Meaningful Research or Discovery Experience | | 6 |
| **Total Hours** | | **120** |

[1] Twelve hours of 300/400 level (advanced) courses in Information Sciences (IS) must be taken on this campus.

[2] Examples of possible experiences may include:

- \# A semester study-abroad with at one or more courses focused on discovery while attending the international institution.
- \# A multi-semester capstone experience within the student's area of specialization.
- \# A semester co-op experience outside of the Champaign-Urbana area focused within the student's area of specialization.
- \# A multi-semester undergraduate research experience under the direction of iSchool faculty.
- \# A summer REU program focused within your area of specialization.

**EP Documentation**

**DMI Documentation**

Key: 1068

**STATEMENT FOR PROGRAMS OF STUDY CATALOG:**

This major is sponsored jointly by the School of Information Sciences (iSchool), and the Departments of Statistics, Computer Science, and Mathematics. The major prepares students for professional or graduate work in the Information Sciences, and for applications in which knowledge of data processing and management is particularly important.

**For the Degree of Bachelor of Science in Information Sciences**

**Major in Information Sciences + Data Science**

E-mail: ischool-is@illinois.edu

General education: Students must complete the Campus General Education requirements including the campus general education language requirement.

Twelve hours of 300 and 400-level courses must be taken on this campus.

Minimum hours required for graduation: 120 hours

Departmental distinction: To graduate with distinction requires a specified minimum grade point average in all Computer Science, Statistics, Information Sciences, and Mathematics courses listed below. A GPA of 3.25 is required for Distinction, 3.5 for High Distinction, and 3.75 for Highest Distinction.

| Course | Title | Hours |
|---|---|---|
| **Data Science Core** | | **28 - 31** |
| **Mathematical Foundations** | | **7 – 8** |
| **Calculus:** One of MATH 220, MATH 221, or MATH 234 | | 4 – 5 |
| **Linear Algebra for Data Science:** MATH 227 or MAT 257 | | 3 |
| **Data Science Fundamentals** | | **12** |
| **Data Science Discovery**: STAT/CS/IS 107 | | 4 |
| **Data Science Exploration:** STAT 207 or STAT 212 | | 4 |
| **Modeling and Learning in Data Science:** CS 307 | | 4 |
| **Computational Fundamentals** | | **4** |
| **Algorithms and Data Structures for Data Science:** CS 277 | | 4 |
| **Social Impact in Data Science** | | **6** |
| **Ethics and Policy for Data Science**: IS 467 | | 3 |
| **Data Management, Curation, and Reproducibility:** IS 477 | | 3 |

| Example Coursework Plan in Information Sciences | 24 - 30 |
|---|---|
| **Introduction to the iSchool:** IS 100 | 1 |
| **Introduction to Information Sciences:** IS 101 | 3 |
| **Social Aspects of Information Technology:** IS 202 | 3 |
| **Research Design for Information Sciences:** IS 204 | 3 |
| **Programming for Information Problems:** IS 205 | 3 |
| **Info Sciences & Culture:** IS 308, 309, 310 or 311 | 3 |
| **Two to four 400-level courses in information Sciences selected from an approved list including: Foundations of Information Processing: IS 430; Data Visualization: IS 445; Database Design and Prototyping: IS 455; Data Storytelling: IS 457; Information Assurance: IS 464 and others** | 8-16 |

| Meaningful Research or Discovery Experience | 6 |
|---|---|
| **Independent Study:** IS 189 | 6 |

One of the most important skills a student will gain in a X+DS degree will be the ability to present data in meaningful ways. A research or discovery experience is as much as pillar of this degree program as both the data science core coursework (Part 1) and the coursework in Information Sciences (Part 2).

This experience should be developed with an adviser before the end of a student's sophomore year and result in the creation of one or more artifacts documenting the experience. A minimum of 6 credit hours must be specifically designated to the preparation and the completion of the experience component. Two smaller experiences may be used to fulfill the full experience requirement.

Examples of possible experiences may include:

- A semester **study-abroad** with at one or more courses focused on discovery while attending the international institution.

- A multi-semester **capstone** experience within the student's area of specialization.

- A semester **co-op experience** outside of the Champaign-Urbana area focused within the student's area of specialization.

- A multi-semester **undergraduate research experience** under the direction of iSchool faculty.

- A summer **REU program** focused within your area of specialization.

| TOTAL HOURS | 61 - 68 |
|---|---|

**ILLINOIS**

MATHEMATICS

College of Liberal Arts & Sciences
273 Altgeld Hall, MC-382
1409 W. Green Street
Urbana, IL 61801  USA

March 8, 2021

To whom it may concern,

I am writing to indicate the support of the Department of Mathematics for the following proposals:

- Accountancy + Data Science
- Astronomy + Data Science
- Finance + Data Science
- Information Sciences + Data Science

These programs will provide students across the university with the opportunity to study data science along with a disciplinary specialization.

The Department of Mathematics supports the inclusion of the following courses in these proposals:

- MATH 220/221
- MATH 234
- MATH 227 or MATH 257

We will provide seats for X + DS students in these courses starting in Fall 2021. We intend to offer MATH 220 every semester, and MATH 221 and MATH 234 at least once per year. MATH 227 and MATH 257 are new courses, which we anticipate to offer for the first time during the 2021-2022 academic year. We intend to offer at least one of these courses each semester.

Sincerely,

Jeremy Tyson
Professor and Chair

**Department of Statistics**
101 Illini Hall
725 South Wright Street
Champaign, IL 61820

October 5, 2020

To Whom It May Concern,

I am writing to indicate the support of the Department of Statistics for the following proposals:

- Accountancy + Data Science
- Astronomy + Data Science
- Finance + Data Science
- Information Sciences + Data Science

These programs will provide students across the university with the opportunity to study data science along with a disciplinary specialization.

The Department of Statistics supports including STAT/CS/IS 107 (to be co-taught by Statistics and Computer Science) and STAT/CS 207 or STAT 212 in the data science core curriculum. We will provide seats for X + DS students in these courses starting in Fall 2021. We intend to offer STAT/CS/IS 107 every semester and other courses at least once a year.

Sincerely,

Bo Li
Professor and Chair
Department of Statistics

**DEPARTMENT OF COMPUTER SCIENCE**

Thomas M. Siebel Center for Computer Science
201 N. Goodwin Ave.
Urbana, IL 61801-2302  USA

**NANCY M. AMATO**

Abel Bliss Professor and Head
2248 Siebel Center
namato@illinois.edu

March 4, 2021

To Whom It May Concern,

I am writing to indicate the support of the Department of Computer Science for the following proposals:

- Accountancy + Data Science
- Astronomy + Data Science
- Finance + Data Science
- Information Sciences + Data Science

These programs will provide students across the university with the opportunity to study data science along with a disciplinary specialization.

The Department of Computer Science supports including STAT/CS/IS 107 (to be co-taught by Statistics and Computer Science), CS 277, and CS/STAT 307 in the data science core curriculum.  We will provide seats for X + DS students in these courses starting in Fall 2021.  We intend to offer STAT/CS/IS 107 every semester and CS 277 and CS/STAT 307 at least once a year.

Sincerely,

**Nancy M. Amato**
Abel Bliss Professor and Head
Department of Computer Science

March 4, 2021

Members of the Education Policy Committee:

I am writing to indicate our support for the following proposals:
Accountancy + Data Science
Astronomy + Data Science
Finance + Data Science
Information Sciences + Data Science

These programs will provide students across the university with the opportunity to study data science along with a disciplinary specialization. In particular, we support including IS 467 and IS 477. The School of Information Sciences will provide seats for all X + DS students in these courses starting in Fall 2021. Each course will be offered at least once per academic year.

Sincerely,

Dr. Emily Knox
Interim Associate Dean for Academic Affairs