ARIZONA STATE UNIVERSITY

PROPOSAL TO ESTABLISH A NEW UNDERGRADUATE DEGREE PROGRAM

This template is to be used only by programs that have received specific written approval from the Provost's office to proceed with internal proposal development and review. The proposal template should be completed in full and submitted to the University Provost's Office [mailto: curriculumplanning@asu.edu]. It must undergo all internal university review and approval steps including those at the unit, college and university levels. A program **may not** be implemented until the Provost's Office notifies the academic unit that the program may be offered.

College/School/Institute: The College of Liberal Arts and Sciences

Department/Division/School: School of Mathematical and Statistical Sciences

Proposing faculty group (*if applicable***):**

Are two or more academic units collaborating on this program? No, this is not a joint program,

If "Yes", list all the additional college(s)/school(s)/institute(s) that will be involved in the development and resources for the degree program by offering courses, faculty or facilities. Please note: This question does not refer to official joint degree programs. Official joint degree programs are ones in which the degree is jointly conferred by two colleges. If the program is jointly conferred, please complete the Proposal to Establish a New Joint Undergraduate Degree Program.

Degree type: BS-Bachelor of Science

If other; provide degree type title and proposed abbreviation:

Name of degree program (major): Data Science

Are any concentrations to be established under this degree program? No, Concentrations will not be added

Is a program fee required? No, a program fee is not required.

What is the first catalog year available for students to select on the undergraduate application for this this program? 2020-2021

Delivery method and campus or location options: select all locations that apply

☐ Downtown Phoenix ☐ Polytechnic ☒ Tempe ☐ Thunderbird ☐ West ☐ Other: _____

☐ **Both** on-campus and ☐ ASU Online* - (check applicable campus(es) from options listed above)

☐ ASU Online only (all courses online and managed by ASU Online)

Note: Once students elect a campus or online option, students will not be able to move between the on-campus and the ASU Online options. Approval from the Office of the University Provost and Philip Regier (Executive Vice Provost and Dean) is required to offer programs through ASU Online. Please contact Ed Plus then complete the ASU Online Offering form in Curriculum ChangeMaker to begin this request.

Proposal Contact

Name:	Donald Jones	**Title:**	Associate Director for Undergraduate Programs
Phone number:	480-965-7195	**Email:**	dajone@asu.edu

DEAN APPROVAL(S)

This proposal has been approved by all necessary unit and College/School levels of review. I recommend implementation of the proposed organizational change.

College/School/Division Dean name: Paul LePore

Signature: _____ **Date:** __/__/20

College/School/Division Dean name:
(if more than one college involved)

Signature: _____ **Date:** __/__/20

Note: An electronic signature, an email from the dean or dean's designee, or a PDF of the signed signature page is acceptable.

1. Purpose and Nature of Program

Provide a brief program description. Include the distinctive features of the program that make it unique.

Modern science and technology use sophisticated mathematical and computational tools to extract patterns from large, complex, and often unordered data sets. Machine learning and data mining are invaluable technologies with applications as diverse as detecting fraudulent online credit-card transactions, understanding the dynamics of social movements, and personalizing medical treatments based on a tumor's unique genetic profile. In accordance with ASU's charter to advance research and discovery of public value, this proposed degree program is a collaborative effort by programs across the College of Liberal Arts and Sciences' Divisions of Natural Sciences and Social and Behavioral Sciences to offer an interdisciplinary Bachelor of Science degree in Data Science. With a mathematical core consisting of linear algebra, statistical inference and classification, data mining, machine learning, and associated computer methods, the School of Mathematical and Statistical Sciences is uniquely positioned to lead the development of this innovative collaboration.

The Data Science degree is proposed to begin as an on-ground program in fall of 2020 and an online program in the fall of 2021.

2. Student Learning Outcomes and Assessment Methods

Assessment Plan
Attach a PDF copy of the assessment plan printed from the University Office of Evaluation and Educational Effectiveness assessment portal demonstrating UOEEE's approval of your assessment plan for this program. Visit the assessment portal at https://uoeee.asu.edu/assessment-portal or contact uoeee@asu.edu with any questions.

3. Academic Curriculum and Requirements

A. **Major Map**
Attach a copy of the "proposed" major map for this degree program. If this program will be delivered online as well as in-person, attach a copy of both the major map and the online major map. Instructions on how to create a "proposed major map" in BAMM can be found in the Build a Major Map Training Guide.

B. **Summary of Credit Hours Required for this Program**
Total credit hours must be 120 and include first year composition, general studies, core/required courses, program specific electives, and any additional requirements (e.g., concentration credits).

Requirements	Credit Hours
First Year Composition	6
ASU 101 (or equivalent)	1
General Studies	29
Core/required courses	31-33
College Science and Society Requirement	6
Additional requirements: Required Track Courses	21-22
Other; please explain: University Electives	24-26
Total	**120**

C. **Core/Required Courses**
   i. Total required and/or core course credit hours

   The core of the major has 10 courses, which consist of 33 hours. This number could vary slightly based on course choices such as choosing MAT 265 over MAT 270. Outside of the core, each student will select a track. These tracks will be drawn from select areas of study and will consist of a minimum of 21 hours.

   ii. List the prefix, number, name and credit hours for each required/core course for this program

2020 Course List for
Data Science (BS) (Proposed)

The College of Liberal Arts and Sciences | EORSZWG

Major Requirements	Credit Hours	Min. Grade
Mathematics Core		
MAT 270: Calculus with Analytic Geometry I (MA) OR MAT 265: Calculus for Engineers I (MA)	4-3	C
MAT 271: Calculus with Analytic Geometry II (MA) OR MAT 266: Calculus for Engineers II (MA)	4-3	C
MAT 343: Applied Linear Algebra	3	C
Data Science Core		
CSE 110: Principles of Programming (CS)	3	C
CSE 205: Object-Oriented Programming and Data Structures (CS)	3	C
DAT 250: Data Science and Society 🚩	3	C
DAT 300: Mathematical Tools for Data Science 🚩	3	C
DAT 301: Exploring Data in R and Python 🚩	4	C
DAT 401: Statistical Modeling and Inference for Data Science 🚩	3	C
DAT 402: Statistical Learning OR CSE 475: Foundations of Machine Learning 🚩	3	C
Required Track Courses		
Required Track Courses	6-7	C
Upper Division Required Track Courses	12-13	C
DAT 490: Data Science Capstone OR Disciplinary Capstone from selected track 🚩	3-2	C
College Requirements		
Science and Society Elective	3	C
Upper Division Science and Society Elective	3	C

Electives	Credit Hours	Min. Grade
Elective	16	
Upper Division Elective	8	

Track/Groups

Behavioral Sciences Track	Biosciences Track	Computer Science Track
Complete five courses from list below:	**Complete one course from list below:**	**Complete four courses from list below:**
CDE 232: Human Development (SB) or FAS 101: Personal Growth in Human Relationships (SB) or PSY 101: Introduction to Psychology (SB)	BIO 439: Computing for Research	CSE 220: Programming for Computer Engineering or CSE 240: Introduction to Programming Languages
FAS 498: Advanced Statistics for Social Sciences or PSY 330: Statistical Methods (CS)	BIO 440: Functional Genomics or MBB 440: Functional Genomics	CSE 310: Data Structures and Algorithms
PSY 290: Research Methods (L or SG)	**Choose five elective courses from list below:**	CSE 365: Information Assurance
PSY 498: Data Mining in the Behavioral Sciences 🚩 or STP 450: Nonparametric Statistics or STP 452: Multivariate Statistics	BIO 355: Introduction to Computational Molecular Biology (CS)	MAT 243: Discrete Mathematical Structures
SOC 390: Social Statistics I (CS)	BIO 411: Quantitative Methods in Conservation and Ecology	**Choose two elective courses from list below:**
Choose one elective course from list below:	BIO 415: Biometry (CS)	CSE 450: Design and Analysis of Algorithms
	BIO 439: Computing for Research	CSE 467: Data and Information Security

CDE 312: Adolescence (SB) or SOC 312: Adolescence (SB)	BIO 440: Functional Genomics or MBB 440: Functional Genomics	CSE 471: Introduction to Artificial Intelligence
CDE 337: Early Childhood Intervention	BIO 494: Data Analysis in Neuroscience	CSE 476: Introduction to Natural Language Processing
CDE 418: Aging and the Life Course (SB & H) or SOC 418: Aging and the Life Course (SB & H)		
CDE 430: Infant/Toddler Development in the Family (SB)		
CDE 450: Child Dysfunction in the Family		
FAS 301: Introduction to Parenting		
FAS 332: Human Sexuality (SB)		
FAS 435: Advanced Marriage and Family Relationships (L or SB) or SOC 435: Advanced Marriage and Family Relationships (L or SB)		
FAS 440: Fundamentals of Marriage and Family Therapy		
LSC 325: Physiological Psychology or PSY 325: Physiological Psychology or PTX 325: Physiological Psychology		
PSY 315: Personality Theory and Research (SB)		
PSY 320: Learning and Motivation		
PSY 324: Memory and Cognition		
PSY 341: Developmental Psychology (SB)		
PSY 350: Social Psychology (SB)		

Mathematics Track	Social Sciences Track	Spatial Sciences Track
Complete both courses below:	**Complete six courses from list below:**	**Complete all six courses below:**
MAT 267: Calculus for Engineers III (MA)	ACO 100: All About Data: Design, Query, and Visualization (CS)	GIS 205: Geographic Information Science I (CS)
MAT 275: Modern Differential Equations (MA)	ALA 235: Introduction to Computer Modeling (CS)	GIS 211: Geographic Information Science II (CS)
Choose four elective courses from list below:	AML 253: Introduction to Mathematical Tools and Modeling for the Life and Social Sciences	GIS 311: Geographic Information Science III (CS)
ACT 370: R and Excel for Actuaries	AML 441: Mathematical Concepts and Tools in Sustainability	GIS 322: Programming Principles in GIS II
ACT 435: Statistics for Risk Modeling	ASM 494: Models in Social Evolution	GIS 461: Fundamentals of Spatial Optimization
MAT 300: Mathematical Structures (L)	BME 301: Numerical Methods in Biomedical Engineering	GIS 471: Spatial Statistics for Geography and Planning
MAT 353: Mathematics and Cancer	BMI 211: Modeling Biomedical Decisions	
MAT 419: Introduction to Linear Optimization (CS)	BMI 461: Advanced Topics in Biomedical Informatics I	
MAT 420: Scientific Computing	BMI 462: Advanced Topics In Biomedical Informatics II	
MAT 421: Applied Computational Methods (CS)	COM 308: Advanced Research Methods in Communication (L)	
MAT 423: Numerical Analysis I (CS)	COM 407: Advanced Critical Methods in Communication	
MAT 425: Numerical Analysis II (CS)	CRJ 303: Statistical Analysis (CS)	
MAT 429: Optimization		
MAT 451: Mathematical Modeling (CS)		
MAT 452: Introduction to Chaos and Nonlinear Dynamics		

STP 310: Design and Analysis of Experiments	ECN 410: Applied Regression Analysis and Forecasting
STP 311: Regression and Time Series Analyses	ECN 416: Game Theory and Economic Behavior
STP 420: Introductory Applied Statistics (CS)	EDP 454: Statistical Data Analysis in Education (CS)
STP 429: Applied Regression (CS)	FAS 361: Research Methods (L or SB)
	FAS 498: Advanced Statistics for Social Sciences
	GCU 351: Population Geography (SB & G)
	GCU 496: Geographic Research Methods (L)
	GPH 494: Advanced Digital Analysis
	HSE 290: Experimental Methods for Human Systems Research (L)
	HSE 390: Qualitative Research Methods (L)
	IFT 200: Information Modeling, Storage and Retrieval
	MKT 352: Marketing Research (L)
	POS 401: Political Statistics (CS)
	PSY 330: Statistical Methods (CS)
	SBS 302: Qualitative Methods
	SBS 389: Ethnographic Field Lab
	SBS 404: Social Statistics II: Multivariate Analysis (CS)
	SOS 211: Calculus and Probability for the Life and Social Sciences (MA)
	SOS 424: Dynamic Modeling in Social and Ecological Systems
	SOS 441: Mathematical Concepts and Tools in Sustainability or AML 441: Mathematical Concepts and Tools in Sustainability
	STP 310: Design and Analysis of Experiments
	STP 311: Regression and Time Series Analyses
	STP 452: Multivariate Statistics
	TWC 301: Fundamentals of Writing for Digital Media (L)
	TWC 411: Principles of Visual Communication (L)

D. Program Specific Electives

   i. Total required program elective credit hours

     None

   ii. List the prefix, number, name and credit hours for any program specific electives for this program

     N/A

E. Additional Program Requirements, if any:
List and describe any capstone experiences, milestone, and/or additional requirements.

F. Concentrations

   i. Are any concentrations to be established under this degree program? No, concentrations will not be established

   ii. If yes, are concentrations required? No, concentrations will not be required

   iii. List courses & additional requirements for the proposed concentration(s)

4. New Course Development

A. Will a new course prefix (es) be required for this degree program? Yes
If yes, list prefix name(s) (i.e. ENG- English): DAT-Data Science

Note: A request for a New Prefix form must be completed for each new prefix required and submitted with this proposal: New prefix request form.

B. New Courses Required for Proposed Degree Program
List all new courses required for this program, including course prefix, number and course description.

CSE 475 Foundations of Machine Learning (3)
Machine learning techniques: supervised learning, unsupervised learning, and neural networks and deep learning.

DAT 250: Data Science and Society (3)
This class will not have a lot of mathematics in it, but rather it will examine quantitative literacy from a data and evidence driven perspective. The course will examine the literature behind vaccines, climate, and other contentious topics where there is a wealth of scientific literature and yet these areas are still hotly debated. We will investigate ways in which data science is abused; how to mislead with statistics, and how these problems have created a lack of trust in science. Through class discussions, case studies and exercises, students will learn the basics of ethical thinking in science, understand the history of ethical dilemmas in scientific work, and study the distinct challenges associated with ethics in modern data science.

DAT 300: Mathematical Tools for Data Science (3)

This course covers the core mathematical topics that underpin data science as well as the key algorithms used for modern data analysis and how to implement them in Python.

DAT 301: Exploring Data in R and Python (4)
This course focuses on the exploration of the types of data typically encountered in modern data science, such as text data, spatial data, and time series data. Various statistical techniques are used to gain insight into the structure of the data, including graphical visualization, linear regression, trees, and clustering.

DAT 401: Statistical Modeling and Inference for Data Science (3)
This course covers the basic statistical concepts underlying data science as well as some of the major methods. The key idea in predictive modeling is the bias-variance tradeoff. Cross validation is the basic approach for dealing with the bias-variance tradeoff. This course covers these fundamental ideas. Statistical inference underlies much of data science methodology. This course covers Bayesian and frequentist approaches to inference and how they are used in some of key ideas and methods in data science such as causal inference with observational data. Some of the key methods covered are K nearest neighbors, naive Bayes classification, A/B testing, linear models, Gaussian processes and data reduction.
DAT 402: Statistical Learning (3)
This course concerns the key modern approaches for uncovering high-dimensional complex structure in data; topics include regularized regression, ensemble methods with trees, deep neural nets, clustering and dimension reduction and state space modeling.

DAT 490: Data Science Capstone (2-4)
Capstone allows students to build a culminating experience that reflects the breadth and depth of their data science experience and allows each student to explore a research area, interest, theme, or question within the realm of data science. Final written projects will be developed in small groups based on consultation either directly within in data science or within their concentration.

Note: New course requests must be submitted electronically via [Curriculum ChangeMaker](#) and undergo all internal university review and approval steps including those at the unit, college, and university levels.

5. Program Need

Explain why the university needs to offer this program (include target audience and market).

There is currently an unmet need in the country for data scientists and that need is expected to grow in the coming years. Glassdoor.com ranks data scientist at the top of its 50 Best Jobs in America. It reports that the average annual salary for data scientists in the Phoenix area is $99,567, and that the national average is $113,436. The McKinsey Global Institute projects that the demand for deep analytical talent in the United States could be 50 to 60 percent greater than its projected supply by 2018. By offering this degree, it helps ASU meet a demand in the country and ensures that we are meeting the needs of our students and society as a whole.

6. Impact on Other Programs

List other academic units that might be impacted by the proposed program and describe the potential impact (e.g., how the implementation of this program might affect student headcount/enrollment, student recruitment, faculty participation, course content, etc. in other programs). Attach letters of collaboration/support from impacted programs

Attached are statements of collaboration and support from New College of Interdisciplinary Arts and Sciences and Ira A. Fulton Schools of Engineering.

In addition to the statements of collaboration and support mentioned above, attached are the following support statements to include courses in the social sciences track.

- Ira A. Fulton School of Engineering

- W.P. Carey School of Business

- College of Integrative Sciences and Arts

- College of Health Solutions

- Mary Lou Fulton Teachers College

- School of Sustainability

- Watts College of Public Service and Community Solutions-School of Criminal Justice

- Hugh Downs School of Human Communication

- School of Politics and Global Studies

- Herberger Institute for Design and the Arts

- School of Human Evolution and Social Change

Units within The College, including the School of Geographical Sciences and Urban Planning, School of Life Sciences, Department of Psychology, and the T. Denny Sanford School of Social and Family Dynamics collaborated with the School of Mathematical and Statistical Sciences in the development of the degree, specifically the tracks, and support the offering of these tracks.

7. Projected Enrollment

How many new students do you anticipate enrolling in this program each year for the next five years?

5-YEAR PROJECTED ANNUAL ENROLLMENT					
	1st Year	2nd Year (Yr 1 continuing + new entering)	3rd Year (Yr 1 & 2 continuing + new entering)	4th Year (Yrs 1, 2, 3 continuing + new entering)	5th Year (Yrs 1, 2, 3, 4 continuing + new entering)
Number of Students Majoring (Headcount)	50	150	200	300	300

8. Accreditation or Licensing Requirements

If applicable, provide the names of the external agencies for accreditation, professional licensing, etc. that guide your curriculum for this program, if any. Describe any requirements for accreditation or licensing.

N/A

9. Faculty & Staff

A. Current Faculty
List the name, rank, highest degree obtained, and area of specialization or expertise of all current faculty who will teach in the program, and estimate their level of involvement.

Richard Hahn, Associate Professor, PhD, Bayesian Statistics, Applied Statistics

Robert McCulloch, Professor, PhD, Bayesian Statistics, Machine Learning

One New Hire in Data Science, Offer Currently Out

B. New Faculty
Describe the new faculty hiring needed during the next three years to sustain the program. List the anticipated hiring schedule and financial sources for supporting the addition of these faculty members.

With the additional courses associated with this new degree, the School of Mathematical and Statistical Sciences (SoMSS) anticipates at least two new hires over the next two hiring cycles at the assistant/associate professor level in the area of statistics or applied mathematics. Additional SoMSS will request one clinical professional faculty line with a primary role of teaching and assisting the school as the Data Sciences degree continues to grow. The director of the School of Mathematical and Statistical Sciences, Professor Al Boggess, has expressed support of these hiring initiatives and will work with The College of Liberal Arts and Sciences to achieve these hiring objectives. Additional lines, funded through online revenues, will be added as the Data Science program is implemented and grows.

C. Administration of the Program

Explain how the program will be administered for the purposes of admissions, advising, course offerings, etc. Discuss the available staff support.

The School of Mathematical and Statistical Sciences is currently anticipating bringing on another advisor to assist with the increased student load for this program. The current staff in SoMSS are prepared and are able to administer the program as it begins. In the third year of the program, a second advisor will be hired to meet the anticipated large growth of online students.

10. Resources (necessary to launch and sustain the program)

A. Required Resources

Describe any new resources required for this program's success, such as new support staff, new facilities, new library resources, new technology resources, etc.

As noted above, the School of Mathematical and Statistical Sciences is supporting the hiring initiatives needed to administer the Data Science program. Specifically, working with The College, SoMSS will request two additional tenured or tenure-track lines and one clinical professor rank faculty over the next two hiring cycles.

B. Resource Acquisition

Explain how the resources to support this program will be obtained.

The School of Mathematical and Statistical Sciences will hire two additional advisors over the first few years of the program to support the student services needs of our new majors. Resources for these new hires will come from new online revenues.

**APPENDIX
OPERATIONAL INFORMATION FOR UNDERGRADUATE PROGRAMS**
(This information is used to populate the Degree Search/catalog website.)

1. **Program Name (Major):** Data Science

2. **Marketing Description** (*Optional.* 50 words maximum. The marketing description should not repeat content found in the program description)

   An estimated shortage of up to 190,000 data analysts in the U.S. is creating high demand for data scientists with the know-how to use data to make effective decisions. From predicting consumer behavior to extracting information from medical images, you will graduate ready for a dynamic career that inspires global change.

3. **Program Description** (150 words maximum)

   Modern science and technology use sophistical mathematical and computational tools to extract patterns from large, complex and often unordered data sets. Machine learning and data mining are invaluable technologies with applications as diverse as detecting fraudulent online credit-card transactions, understanding the dynamic of social movements, and personalizing medical treatments based on a tumor's unique genetic profile.

   The BS degree in data science prepares students to be critical analysts and users of data in a variety of areas such as business, research and government. This transdisciplinary degree allows students to choose a focus area from a variety of fields to center their understanding of data science. With a mathematical core consisting of linear algebra, statistical inference and classification, data mining, machine learning and associated computer methods, students leave the program with a strong background in data-related skills that are useful in solving real world issues.

4. **Contact and Support Information**

Building code and room number: (*Search ASU map*)	WXLR 211
Program office telephone number: (*i.e. 480/965-2100*)	480/965-7195
Program Email Address:	math@asu.edu
Program Website Address:	https://math.asu.edu

5. **Delivery/Campus Information Options:** Both, On-Campus and ASU Online

   Note: Once students elect a campus or online option, students will not be able to move between the on-campus and the ASU Online options. Approval from the Office of the University Provost and Philip Regier (Executive Vice Provost and Dean) is required to offer programs through ASU Online. Please contact Ed Plus then complete the ASU Online Offering form in Curriculum ChangeMaker to begin this request.

6. **Campus/Locations** *indicate **all** locations where this program will be offered.*

   ☐ Downtown Phoenix   ☐ Polytechnic   ☒ Tempe   ☐ Thunderbird   ☐ West   ☐ Other: _____

7. **Additional Program Description Information**

   A. Additional program fee required for this program?   No
   B. Does this program have a second language requirement?   No

8. **Career Opportunities**
   Provide a brief description of career opportunities available for this degree program. (150 words maximum)

   Glassdoor.com ranks data scientist as third in the top 50 Best Jobs in America. It reports that the average annual salary for data scientists is $107,801 in 2020. Students in this program end up working in a variety of fields such as governmental research, education, health services and business. In the data science program, students learn skills related to data analysis, data prediction models and ethical uses of research data.   The McKinsey Global Institute projects a shortage of qualified workers with deep

analytical skills. This degree helps students prepare to meet the expressed needs of society.

9. **Additional Freshman Admission Requirements**
   If applicable, list any freshman admission requirements that are higher than and/or in addition to the university minimum undergraduate admission requirements.

   ASU General Admission Requirements

10. **Additional Transfer Admission Requirements**
    If applicable, list any admission requirements for transfer students that are higher than and/or in addition to the university minimum undergraduate transfer admission requirements.

    ASU General Admission Requirements

11. **Change of Major Requirements**
    Standard change of major text is as follows: A current ASU student has no additional requirements for changing majors. Students should refer to https://students.asu.edu/changingmajors for information about how to change a major to this program.

    a. Change of Major Email Address: math@asu.edu

    If applicable, list any additional requirements for students who may change their major into this program.

    N/A

12. **Keywords**
    List all keywords used to search for this program (limit 10). Keywords should be specific to the proposed program.

    Math, Mathematics, Statistics, Data Mining, Consumer Behavior, Machine Learning, Analysis, Data Analysis, Research, Research Ethics

13. **Advising Committee Code**
    List the existing advising committee code to be associated with this degree.
    Note: If a new advising committee needs to be created, please complete the following form:
    Proposal to create an undergraduate advising committee

    UGASMA

14. **First Required Math Course**
    List the first math course required in the major map.

    MAT 270 OR MAT 265

15. **WUE Eligible**
    Has a request been submitted to the Provost by the Dean to consider this degree program as eligible for WUE?

    No

    Note: No action will be taken during the implementation process with regards to WUE until approval is received from the Provost.

16. **Math Intensity**
    a. List the highest math course required on the major map. (This will not appear on Degree Search.)

    MAT 343

    b. What is the math intensity as indicated by the highest math required on the major map? Math intensity categorization can be found here: https://catalog.asu.edu/mathintensity

    Substantial

17. **Global Experience**

    With over 250 programs in more than 65 countries (ranging from one week to one year), study abroad is possible for all ASU students wishing to gain global skills and knowledge in preparation for a 21st-century career. Students earn ASU credit for completed courses, while staying on track for graduation, and may apply financial aid and scholarships toward program costs.

https://mystudyabroad.asu.edu/

18. ONET Codes

Identify ONET/SOC codes that should be displayed on Degree Search. ONET/SOC codes can be found at:
http://www.onetonline.org/crosswalk/SOC/. Alternate titles displayed on Degree Search may vary and can be found at:
https://catalog.asu.edu/alternate-career-titles.

15-1132.00-	Software Engineer	15-2041.00	Statistician
19-1021.00	Scientist/Biochemist	19-2042.00	Geologist
19-3039.01	Neuropsychologist		

19. Area(s) of Interest

A. Select **one (1)** primary area of interest from the list below that applies to this program.

- ☐ **Architecture & Construction**
- ☐ **Arts**
- ☐ **Business**
- ☐ **Communications & Media**
- ☒ **Computing & Mathematics**
- ☐ **Education & Teaching**
- ☐ **Engineering & Technology**
- ☐ **Entrepreneurship**
- ☐ **Exploratory**
- ☐ **Health & Wellness**
- ☐ **Humanities**
- ☐ **Interdisciplinary Studies**
- ☐ **Law, Justice, & Public Service**
- ☐ **STEM**
- ☐ **Science**
- ☐ **Social and Behavioral Sciences**
- ☐ **Sustainability**

B. Select **one (1)** secondary area of interest from the list below that applies to this program.

- ☐ **Architecture & Construction**
- ☐ **Arts**
- ☐ **Business**
- ☐ **Communications & Media**
- ☐ **Computing & Mathematics**
- ☐ **Education & Teaching**
- ☐ **Engineering & Technology**
- ☐ **Entrepreneurship**
- ☐ **Exploratory**
- ☐ **Health & Wellness**
- ☐ **Humanities**
- ☐ **Interdisciplinary Studies**
- ☐ **Law, Justice, & Public Service**
- ☐ **STEM**
- ☒ **Science**
- ☐ **Social and Behavioral Sciences**
- ☐ **Sustainability**

BS in Data Science

Status: UOEEE Provisional Approval

Comments: Plan meets UOEEE requirement and include American institutions, civil discourse and ethics.

Element	Outcome	Measure	Description
AP_2Goal	0		
Outcome	1	0	Graduates of the program will be able to think critically while analyzing data sets to make action oriented ethical recommendations for societal change.
Plan_1GenEd	1		Critical Thinking;Ethical Reasoning;Information Literacy;Problem Solving;Quantitative Reasoning/Literacy;Verbal Communication;Written Communication;
Plan_2Concepts	1		Students will utilize ethical decision making frameworks and a basic understanding of statistical concepts of how data can be presented.
Plan_3Competencies	1		Students will be required to be competent in quantitative reasoning, programming languages, and problem solving.
AP_1Process	1	1	For this outcome, faculty developed rubrics will be used with key assignments in two key classes, DAT 250, and DAT 401.
Measure	1	1	In DAT 250, Data Science and Society, students will complete an embedded assignment which has students thinking critically and making societal recommendations about real life data sets. Focus will be gear toward ethical implications of the use and misuse of data.
PC	1	1	Students will assessed against a faculty developed rubric on quantitative reasoning, problem solving, ethical considerations, and effective communication on the presentation of data. 70% of students will attain a minimum rating of meets expectations on all rubric items.
Measure	1	2	In the Data Science capstone course, DAT 490, students will complete an embedded final project which has students identifying a real world problem, evaluating numerous data sets using learned data programming languages with regard to credibility, and interpreting their findings to make ethical recommendations on future action.
PC	1	2	Students will be assessed against a faculty developed rubric on problem solving, effective communication, critical thinking, ethical considerations, and their evaluation of evidence. 70% of students will attain a minimum rating of meets expectations on all rubric items.

Element	Outcome	Measure	Description
Outcome	2	0	Graduates of the program will be able to critically engage with real world data problems involving chosen areas in the United States such as healthcare, education, and government.
Plan_1GenEd	2		Critical Thinking;Problem Solving;Quantitative Reasoning/Literacy;Verbal Communication;Written Communication;
Plan_2Concepts	2		Students will draw upon ethical decision making frameworks, R and Python computer programming languages, and mathematical reasoning to analyze and make decisions about data impacting American Institutions such as health care, education, and governmental research.
Plan_3Competencies	2		Students will be required to be competent in quantitative reasoning, programming languages, and problem solving. Students will need to have some working knowledge of select American Institutions to have a firm understanding of the nuances of the data.
AP_1Process	2	1	For this outcome, faculty developed rubrics will be used with key assignments in two key classes, DAT 250, and DAT 402.
Measure	2	1	In DAT 250 , Data Science and Society, students will identify a real world problem that relates to a key issue in the United States that relates to healthcare, government, or education, and create a presentation to show how methods in Data Science can influence the outcomes in positive and negative fashions. The presentations will be evaluated on mathematical reasoning, critical thinking, ethical considerations, and problem solving.
PC	2	1	The presentations will be evaluated on mathematical reasoning, critical thinking, ethical considerations, and problem solving. 70% of students will attain a minimum rating of meets expectations on all rubric items.
Measure	2	2	In DAT 402, Statistical Learning, students will complete an embedded assignment to create a computer program that is able to discover and identify patterns in a data set related a real-world institution in the United States such as a governmental or environmental agency. The results will be used to make predictions and recommendations from an ethical point of view. The assignment will be assessed on a faculty developed rubric that covers validity of the created model program, effective communication that focuses on civil discourse, ethical considerations, and mathematical reasoning.
PC	2	2	The assignment will be assessed on a faculty developed rubric that covers validity of the created model program, level of potential impact, effective communication, and mathematical reasoning. 70% of students will attain a minimum rating of meets expectations on all rubric items.

Element	Outcome	Measure	Description
Outcome	3	0	Graduates of the program will be able to develop team oriented skills related to civil discourse while utilizing diverse programming languages and statistical processes to interpret results of their own data collection.
Plan_1GenEd	3		Critical Thinking;Problem Solving;Quantitative Reasoning/Literacy;Teamwork and Collaboration;Verbal Communication;Written Communication;
Plan_2Concepts	3		Students will draw upon frameworks of ethical decision making, statistical modeling, and testing methodologies.
Plan_3Competencies	3		Students will need to be competent in communication with other individuals in order to see problems from multiple points of view in an effort to enhance the overall understanding of the issues along with statistical reasoning to evaluate their selected programs.
AP_1Process	3	1	Faculty developed rubrics will be utilized in DAT 301 and DAT 401 for key assignments.
Measure	3	1	In DAT 301, Exploring Data in R and Python, students will complete a series of embedded assignments that utilize real world data sets in a team setting to interpret, evaluate, and communicate findings to others in an effort to increase the understanding of the problem to others.
PC	3	1	Work will be graded against a faculty developed rubric that focuses on problem solving, effective communication, and statistical reasoning. On an average of all assignments, 70% of students will attain a minimum rating of meets expectations on all rubric items.
Measure	3	2	In DAT 401, Statistical Modeling and Inference for Data Science, students will complete an embedded assignment that requires them to work in groups to encourage civil discourse and think critically and ethically to create statistical models and utilize proper testing methodologies to provide insight into real world problems.
PC	3	2	Student work will be assessed by a faculty developed rubric that focuses on mathematical reasoning, civil discourse, and problem solving.70% of students will attain a minimum rating of meets expectations on all rubric items.

Element	Outcome	Measure	Description
Outcome	4	0	Students will be able to critique data interpretations provided by real world sources and make critical inferences regarding the validity of provided data.
Plan_1GenEd	4		Critical Thinking;Information Literacy;Quantitative Reasoning/Literacy;
Plan_2Concepts	4		Students will draw upon information related to ethical decision making and making informed decisions based on real world data from American Institutions such as health care, education, business, and governmental research. .
Plan_3Competencies	4		Students must be competent in qualitative reasoning and data wrangling (cleaning data) to be successful with these measures. A working knowledge of their selected American Institutions will be useful in conceptualizing the problem and how it is represented in the data.
AP_1Process	4	1	Faculty developed rubrics will be used in DAT 490 and DAT 250.
Measure	4	1	In DAT 250, Data Science and Society, students will complete an embedded assignment which requires them to critique and evaluate multiple data sets to make determinations on data validity and any ethical dilemmas present in data sets.
PC	4	1	Work will be assessed by a faculty developed rubric that focuses on problem solving, deductive reasoning, and creative thinking. 70% of students will attain a minimum rating of meets expectations on all rubric items.
Measure	4	2	In the Data Science capstone course, DAT 490, students will complete an embedded assignment that focuses on interpretations and recommendations of real world data sets taken from American institutions such as education, business, and governmental agencies. .
PC	4	2	Student work will be evaluated on mathematical reasoning, critical thinking, and thoroughness. 70% of students will attain a minimum rating of meets expectations on all rubric items.

If you have questions, please e-mail assessment@asu.edu or call UOEEE at (480) 727-1731.

2020 - 2021 Major Map
Data Science, (Proposed)

School/College:
EORSZWG

Term 1 0 - 15 Credit Hours Critical course signified by ⬥	Hours	Minimum Grade	Notes
⬥ CSE 110: Principles of Programming (CS)	3	C	• An SAT, ACT, Accuplacer, IELTS or TOEFL score determines placement into first-year composition courses. • Mathematics Placement Assessment score determines placement in mathematics course. • ASU 101 or college-specific equivalent First-Year Seminar is required for all first-year students. • Students who complete MAT 270 must also complete MAT 271 in Term 2. Students who complete MAT 265 must also complete MAT 266 in Term 2. • It is highly recommended that students work with both an academic advisor from the School of Mathematical and Statistical Sciences and an assigned advisor affiliated with their chosen track. • Select your career interest area and play me3@ASU.
⬥ LIA 101: Student Success in The College of Liberal Arts and Sciences	1		
⬥ MAT 270: Calculus with Analytic Geometry I (MA) OR MAT 265: Calculus for Engineers I (MA)	4-3	C	
ENG 101 or ENG 102: First-Year Composition OR ENG 105: Advanced First-Year Composition OR ENG 107 or ENG 108: First-Year Composition	3	C	
Natural Science - Quantitative (SQ)	4		
Term hours subtotal:	15-14		

Term 2 15 - 31 Credit Hours Critical course signified by ⬥	Hours	Minimum Grade	Notes
⬥ CSE 205: Object-Oriented Programming and Data Structures (CS)	3	C	• Students who complete MAT 270 must also complete MAT 271. Students who complete MAT 265 must also complete MAT 266. • Some upper-division track courses require prerequisites. It is recommended that students consult with their advisors and use electives to complete appropriate course prerequisites. • Create a first draft resume.
⬥ MAT 271: Calculus with Analytic Geometry II (MA) OR MAT 266: Calculus for Engineers II (MA)	4-3	C	
ENG 101 or ENG 102: First-Year Composition OR ENG 105: Advanced First-Year Composition OR ENG 107 or ENG 108: First-Year Composition	3	C	
Humanities, Arts and Design (HU) AND Cultural Diversity in the U.S. (C)	3		
Elective	3-4		
⬥ Complete ENG 101 OR ENG 105 OR ENG 107 course(s).			
Term hours subtotal:	16		

Term 3 31 - 46 Credit Hours Critical course signified by ⬥	Hours	Minimum Grade	Notes
⬥ DAT 250: Data Science and Society	3	C	• Students must choose and complete a minimum of 21 credit hours in their selected track. Track options are Behavioral Sciences, Biosciences, Computer Science, Mathematics, Social Sciences or Spatial Sciences. • Some track courses may require additional prerequisites, so students will work with an assigned academic advisor in their track as well
⬥ MAT 343: Applied Linear Algebra	3	C	
Natural Science - Quantitative (SQ) OR Natural Science - General (SG)	4		
Complete 2 courses: Elective	5		
⬥ Complete First-Year Composition requirement.			
Complete Mathematics (MA) requirement.			

as the School of Mathematical and Statistical Sciences to select electives to satisfy necessary prerequisites.

Term 4 46 - 61 Credit Hours Critical course signified by ❗	Hours	Minimum Grade	Notes
❗ DAT 300: Mathematical Tools for Data Science	3	C	• Students pursuing the Computer Science track are advised to take CSE 220 this term due to pre-requisite requirements in future terms. • Explore an internship.
Required Track Courses	3-4	C	
Science and Society Elective	3	C	
Complete 2 courses: Elective	6		
Term hours subtotal:	15-16		

Term 5 61 - 76 Credit Hours Necessary course signified by ⭐	Hours	Minimum Grade	Notes
⭐ DAT 301: Exploring Data in R and Python	4	C	• Students pursuing the Computer Science track are advised to take CSE 310 in this term due to pre-requisite requirements in future terms. • Develop your professional online presence.
Upper Division Required Track Courses	3-4	C	
Required Track Courses	3	C	
Humanities, Arts and Design (HU) AND Historical Awareness (H)	3		
Elective	2-3		
Term hours subtotal:	15-17		

Term 6 76 - 91 Credit Hours Necessary course signified by ⭐	Hours	Minimum Grade	Notes
⭐ DAT 401: Statistical Modeling and Inference for Data Science	3	C	
Complete 2 courses: Upper Division Required Track Courses	6	C	
Social-Behavioral Sciences (SB) AND Global Awareness (G)	3		
Upper Division Elective	3		
⭐ Complete Cultural Diversity in the U.S. (C) AND Global Awareness (G) AND Historical Awareness (H) course(s).			
Term hours subtotal:	15		

Term 7 91 - 106 Credit Hours Necessary course signified by ⭐	Hours	Minimum Grade	Notes
⭐ DAT 402: Statistical Learning OR CSE 475: Foundations of Machine Learning	3	C	• Students pursuing the Computer Science track are advised to enroll in CSE 475 rather than DAT 402. Students pursuing all other tracks are advised to enroll in DAT 402 in this term. • Gather professional references.
Upper Division Required Track Courses	3	C	
Upper Division Science and Society Elective	3	C	
Upper Division Humanities, Arts and Design (HU) OR Upper Division Social-Behavioral Sciences (SB)	3		
Literacy and Critical Inquiry (L)	3		
Term hours subtotal:	15		

Term 8 106 - 120 Credit Hours Necessary course signified by ⭐	Hours	Minimum Grade	Notes
⭐ DAT 490: Data Science Capstone OR Disciplinary Capstone from selected track	3-2	C	• Students pursuing the Spatial Sciences track will complete a two credit hour capstone course, all other tracks require three credits of capstone coursework.
Upper Division Literacy and Critical Inquiry (L)	3		
Social-Behavioral Sciences (SB)	3		
Complete 2 courses: Upper Division Elective	5		

Term hours subtotal: 14-13

- Meet with your academic advisor for final degree check and apply for graduation through your My ASU.

- - All students pursuing a BS or BSP degree in The College of Liberal Arts and Sciences must complete two courses from the Science and Society list found at https://thecollege.asu.edu/resources/science-society. At least one of the two courses must be upper-division and students must earn a C or better in the courses. Both Science and Society courses (i.e., all six credits) may count towards any major, minor, related fields, and ASU General Studies requirements.
  - Behavioral Sciences Track: In cooperation with an assigned academic advisor, students must complete five required courses from the initial group of courses displayed in the track and one additional required course from the remaining list. Students must also complete three credit hours in DAT 490 or a 400-level disciplinary capstone course drawn from the CDE, FAS, or PSY prefixes.
  - Biosciences Track: Students are required to complete either BIO 439 or BIO/MBB 440 and three credit hours in the DAT 490 Data Science Capstone. An additional five courses (minimum of 15 credit hours) are chosen from the remaining track electives.
  - Computer Science Track: In consultation with advisor, students must complete four required courses (12 credit hours) and pick two related courses (6 credit hours). In addition, they must complete three credit hours in the DAT 490 Data Science Capstone.
  - Mathematics Track: Students are to complete MAT 267 and MAT 275. In cooperation with an academic advisor, students must also select four courses from the remaining courses in the track list below. In addition, students need to complete three credit hours in DAT 490 Data Science Capstone.
  - Social Sciences Track: In consultation with an assigned academic advisor, students will select six courses for a minimum of 18 credit hours from the track list below, at least 12 credit hours of which must be upper-division. In addition, students must complete 3 credit hours in DAT 490 Data Science Capstone or a disciplinary-specific capstone course.
  - Spatial Sciences Track: Students must complete all six courses listed in the track. In addition, they will complete two credit hours of DAT 490 Data Science Capstone or a 400-level GIS capstone course chosen in consultation with an assigned academic advisor.

Hide Course List(s)/Track Group(s)

Behavioral Sciences Track	Biosciences Track	Computer Science Track
Complete five courses from list below:	**Complete one course from list below:**	**Complete four courses from list below:**
CDE 232: Human Development (SB) or FAS 101: Personal Growth in Human Relationships (SB) or PSY 101: Introduction to Psychology (SB)	BIO 439: Computing for Research	CSE 220: Programming for Computer Engineering or CSE 240: Introduction to Programming Languages
	BIO 440: Functional Genomics or MBB 440: Functional Genomics	
FAS 498: Advanced Statistics for Social Sciences or PSY 330: Statistical Methods (CS)	**Choose five elective courses from list below:**	CSE 310: Data Structures and Algorithms
		CSE 365: Information Assurance
PSY 290: Research Methods (L or SG)	BIO 355: Introduction to Computational Molecular Biology (CS)	MAT 243: Discrete Mathematical Structures
PSY 498: Data Mining in the Behavioral Sciences or STP 450: Nonparametric Statistics or STP 452: Multivariate Statistics	BIO 411: Quantitative Methods in Conservation and Ecology	**Choose two elective courses from list below:**
		CSE 450: Design and Analysis of Algorithms
SOC 390: Social Statistics I (CS)	BIO 415: Biometry (CS)	CSE 467: Data and Information Security
Choose one elective course from list below:	BIO 439: Computing for Research	CSE 471: Introduction to Artificial Intelligence
	BIO 440: Functional Genomics or MBB 440: Functional Genomics	

CDE 312: Adolescence (SB) or SOC 312: Adolescence (SB)

CDE 337: Early Childhood Intervention

CDE 418: Aging and the Life Course (SB & H) or SOC 418: Aging and the Life Course (SB & H)

CDE 430: Infant/Toddler Development in the Family (SB)

CDE 450: Child Dysfunction in the Family

FAS 301: Introduction to Parenting

FAS 332: Human Sexuality (SB)

FAS 435: Advanced Marriage and Family Relationships (L or SB) or SOC 435: Advanced Marriage and Family Relationships (L or SB)

FAS 440: Fundamentals of Marriage and Family Therapy

LSC 325: Physiological Psychology or PSY 325: Physiological Psychology or PTX 325: Physiological Psychology

PSY 315: Personality Theory and Research (SB)

PSY 320: Learning and Motivation

PSY 324: Memory and Cognition

PSY 341: Developmental Psychology (SB)

PSY 350: Social Psychology (SB)

BIO 494: Data Analysis in Neuroscience

CSE 476: Introduction to Natural Language Processing

Mathematics Track	Social Sciences Track	Spatial Sciences Track

Complete both courses below:

MAT 267: Calculus for Engineers III (MA)

MAT 275: Modern Differential Equations (MA)

Choose four elective courses from list below:

ACT 370: R and Excel for Actuaries

ACT 435: Statistics for Risk Modeling

MAT 300: Mathematical Structures (L)

MAT 353: Mathematics and Cancer

MAT 419: Introduction to Linear Optimization (CS)

MAT 420: Scientific Computing

Complete six courses from list below:

ACO 100: All About Data: Design, Query, and Visualization (CS)

ALA 235: Introduction to Computer Modeling (CS)

AML 253: Introduction to Mathematical Tools and Modeling for the Life and Social Sciences

AML 441: Mathematical Concepts and Tools in Sustainability

ASM 494: Models in Social Evolution

BME 301: Numerical Methods in Biomedical Engineering

BMI 211: Modeling Biomedical Decisions

BMI 461: Advanced Topics in Biomedical Informatics I

Complete all six courses below:

GIS 205: Geographic Information Science I (CS)

GIS 211: Geographic Information Science II (CS)

GIS 311: Geographic Information Science III (CS)

GIS 322: Programming Principles in GIS II

GIS 461: Fundamentals of Spatial Optimization

GIS 471: Spatial Statistics for Geography and Planning

MAT 421: Applied Computational Methods (CS)

MAT 423: Numerical Analysis I (CS)

MAT 425: Numerical Analysis II (CS)

MAT 429: Optimization

MAT 451: Mathematical Modeling (CS)

MAT 452: Introduction to Chaos and Nonlinear Dynamics

STP 310: Design and Analysis of Experiments

STP 311: Regression and Time Series Analyses

STP 420: Introductory Applied Statistics (CS)

STP 429: Applied Regression (CS)

BMI 462: Advanced Topics In Biomedical Informatics II

COM 308: Advanced Research Methods in Communication (L)

COM 407: Advanced Critical Methods in Communication

CRJ 303: Statistical Analysis (CS)

ECN 410: Applied Regression Analysis and Forecasting

ECN 416: Game Theory and Economic Behavior

EDP 454: Statistical Data Analysis in Education (CS)

FAS 361: Research Methods (L or SB)

FAS 498: Advanced Statistics for Social Sciences

GCU 351: Population Geography (SB & G)

GCU 496: Geographic Research Methods (L)

GPH 494: Advanced Digital Analysis

HSE 290: Experimental Methods for Human Systems Research (L)

HSE 390: Qualitative Research Methods (L)

IFT 200: Information Modeling, Storage and Retrieval

MKT 352: Marketing Research (L)

POS 401: Political Statistics (CS)

PSY 330: Statistical Methods (CS)

SBS 302: Qualitative Methods

SBS 389: Ethnographic Field Lab

SBS 404: Social Statistics II: Multivariate Analysis (CS)

SOS 211: Calculus and Probability for the Life and Social Sciences (MA)

SOS 424: Dynamic Modeling in Social and Ecological Systems

SOS 441: Mathematical Concepts and Tools in Sustainability or AML 441: Mathematical Concepts and Tools in Sustainability

STP 310: Design and Analysis of Experiments

STP 311: Regression and Time Series Analyses

STP 452: Multivariate Statistics

TWC 301: Fundamentals of Writing for
Digital Media (L)

TWC 411: Principles of Visual
Communication (L)

Notes:

- Please keep in mind that the applicability of a specific transfer course toward an ASU degree program depends on the requirements of the department, division, college or school in which you are enrolled at ASU. Transfer agreements that guarantee the completion of university level requirements do not necessarily meet college and major requirements. Please consult with an advisor for more information.

Total Hours: 120
Upper Division Hours: 45 minimum
Major GPA: 2.00 minimum
Cumulative GPA: 2.00 minimum
Total hrs at ASU: 30 minimum
Hrs Resident Credit for
Academic Recognition: 56 minimum
Total Community College Hrs: 64 maximum
Total College Residency Hrs: 12 minimum

General University Requirements Legend

General Studies Core Requirements:

- Literacy and Critical Inquiry (L)
- Mathematical Studies (MA)
- Computer/Statistics/Quantitative Applications (CS)
- Humanities, Arts and Design (HU)
- Social-Behavioral Sciences (SB)
- Natural Science - Quantitative (SQ)
- Natural Science - General (SG)

General Studies Awareness Requirements:

- Cultural Diversity in the U.S. (C)
- Global Awareness (G)
- Historical Awareness (H)

First-Year Composition

General Studies designations listed on the major map are current for the 2020 - 2021 academic year.

From:	James Collofello
Sent:	Tuesday, March 3, 2020 9:13 AM
To:	Paul LePore
Cc:	Jenny Smith; Jeremy Helm
Subject:	RE: Data Sciences BS -- Social Sciences Track -- FSE Courses

Hi Paul,

FSE is supportive of your request to utilize our courses in the Social Science Track of the BS Data Science degree.

jim

James S. Collofello
Vice Dean for Academic and Student Affairs
Professor of Computer Science and Engineering
School of Computing Informatics and Decision Systems Engineering
Ira A. Fulton Schools of Engineering
Arizona State University

From: Paul LePore <Paul.Lepore@asu.edu>
Sent: Monday, March 2, 2020 6:22 PM
To: Jeremy Helm <JEREMY.HELM@asu.edu>; James Collofello <JAMES.COLLOFELLO@asu.edu>
Cc: Jenny Smith <jenny.smith@asu.edu>; Paul LePore <Paul.Lepore@asu.edu>
Subject: Data Sciences BS -- Social Sciences Track -- FSE Courses

March 2, 2020

Dear Jim and Jeremy,

I am writing to ask if you would be willing to provide a letter of support for including the list of courses from your academic unit (see below) as electives in our new **Data Sciences BS degree (Social Sciences Track)**. The full degree proposal is included as a PDF attachment.

The **Data Sciences Degree, Social Sciences Track** electives build on the Social Sciences Research Methods Certificate – a degree that is currently approved, available, and already uses the courses below as part of that certificate program.

Courses:

- BME 301 Numerical Methods of Biomedical Engineering
- HSE 290 Experimental Methods for Human Systems Research
- HSE 390 Qualitative Research Methods
- IFT 200 Information Modeling, Storage and Retrieval

A short email to me and Jenny Smith would be much appreciated. I also am happy to discuss this request or the Data Sciences BS degree more generally.

Thank you,
Paul LePore

PAUL C. LEPORE, Ph.D.
Associate Dean
The College of Liberal Arts and Sciences
Armstrong Hall, Suite 152-H
1100 South McAllister Avenue
Arizona State University | P.O. Box 872601 | Tempe, Arizona 85287-2601
480.965.6506 | Fax: 480.965.2110 | e-mail: paul.lepore@asu.edu

ASU College of Liberal Arts and Sciences — *First Year Forward*

From:	Amy Hillman (DEAN)
Sent:	Tuesday, March 3, 2020 2:42 PM
To:	Paul LePore
Cc:	Michele Pfund; Kay Faris; Jenny Smith
Subject:	Re: Data Sciences BS -- Social Sciences Track -- Carey School of Business

OK, thanks Paul. We are supportive of this going forward.

Amy

Amy J. Hillman, PhD
Dean and
Charles J. Robel Dean's Chair
W. P. Carey School of Business
Arizona State University
amy.hillman@asu.edu
480.965.3402

On Mar 3, 2020, at 2:17 PM, Paul LePore <Paul.Lepore@asu.edu> wrote:

Hi Amy,

We will have a business track (we are working on that now with your faculty) – the courses below are already a part of the Social Sciences Methods Certificate (there are lots of other courses to choose from beyond the ones in Carey) and yes students need to complete all the pre-reqs for a course to count.

For the majors only, I suspect a student in Marketing may want to double major with Data Sciences (and then that option would be good) or simply opt for the Soc Sciences Methods certificate.

PL

PAUL C. LEPORE, Ph.D.
Associate Dean
The College of Liberal Arts and Sciences
Armstrong Hall, Suite 152-H
1100 South McAllister Avenue
Arizona State University | P.O. Box 872601 | Tempe, Arizona 85287-2601
480.965.6506 | Fax: 480.965.2110 | e-mail: paul.lepore@asu.edu

ASU College of Liberal Arts and Sciences — *First Year Forward*

From: Amy Hillman (DEAN) <AMY.HILLMAN@asu.edu>
Sent: Tuesday, March 3, 2020 2:10 PM
To: Paul LePore <Paul.Lepore@asu.edu>; Michele Pfund <Michele.Pfund@asu.edu>

1

Hi Paul,

MKT 352 is for marketing degree students only and has a marketing pre-requisite.
ECN 410 and ECN 416 require the following pre-requisites: ECN 211, ECN 212, ECN 221, ECN 312 and
ECN 313. ECN 416 is only offered once per year in spring term.

These don't seem to be great choices. We asked via Nancy if we could do a business analytics track,
which we could pull off out of our CIS department without this issues.

How do you want to move forward?
Amy

Amy J. Hillman, PhD
Dean and
Charles J. Robel Dean's Chair
W. P. Carey School of Business
Arizona State University
amy.hillman@asu.edu
480.965.3402

On Mar 2, 2020, at 6:31 PM, Paul LePore <Paul.Lepore@asu.edu> wrote:

March 2, 2020

Dear Deans Hillman and Faris,

I am writing to ask if you would be willing to provide a letter of support for
including the list of courses from your academic unit (see below) as electives in
our new **Data Sciences BS degree (Social Sciences Track)**. The full degree
proposal is included as a PDF attachment.

The **Data Sciences Degree, Social Sciences Track** electives build on the Social
Sciences Research Methods Certificate – a degree that is currently approved,
available, and already uses the courses below as part of that certificate program.

Courses:

- ECN 410 Applied Regression Analysis and Forecasting
- ECN 416 Game Theory and Economic Behavior
- MKT 352 Marketing Research

A short email to me and Jenny Smith would be much appreciated. I also am
happy to discuss this request or the Data Sciences BS degree more generally.

Thank you,
Paul LePore

PAUL C. LEPORE, Ph.D.
Associate Dean
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480.965.6506 | Fax: 480.965.2110 | e-mail: paul.lepore@asu.edu

ASU College of Liberal Arts and Sciences — *First Year Forward*

<Data Science BS 2-27-20.pdf>

From:	Duane Roen (Dean)
Sent:	Monday, March 2, 2020 7:13 PM
To:	Paul LePore
Cc:	Jenny Smith
Subject:	RE: Data Sciences BS -- Social Sciences Track -- CISA

Hi, Paul and Jenny.

CISA is delighted to make TWC 301 and TWC 411 available as elective courses for the BS in Data Sciences (Social Sciences Track).

The program looks great.

Best,
Duane

Duane Roen
Vice Provost, Polytechnic campus
Dean, College of Integrative Sciences and Arts
Arizona State University
Mail Code: 2780
7271 E Sonoran Arroyo Mall
Mesa, AZ 85212-6415
P: 480-727-1415

From: Paul LePore <Paul.Lepore@asu.edu>
Sent: Monday, March 2, 2020 6:36 PM
To: Duane Roen (Dean) <Duane.Roen@asu.edu>
Cc: Paul LePore <Paul.Lepore@asu.edu>; Jenny Smith <jenny.smith@asu.edu>
Subject: Data Sciences BS -- Social Sciences Track -- CISA

March 2, 2020

Dear Dean Roen,

I am writing to ask if you would be willing to provide a letter of support for including the list of courses from your academic unit (see below) as electives in our new **Data Sciences BS degree (Social Sciences Track)**. The full degree proposal is included as a PDF attachment.

The **Data Sciences Degree, Social Sciences Track** electives build on the Social Sciences Research Methods Certificate – a degree that is currently approved, available, and already uses the courses below as part of that certificate program.

Courses:

- TWC 301 Fundamentals of Writing for Digital Media
- TWC 411 Principles of Visual Communication

1

A short email to me and Jenny Smith would be much appreciated. I also am happy to discuss this request or the Data Sciences BS degree more generally.

Thank you,
Paul LePore

PAUL C. LEPORE, Ph.D.
Associate Dean
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480.965.6506 | Fax: 480.965.2110 | e-mail: paul.lepore@asu.edu

ASU College of Liberal Arts and Sciences — *First Year Forward*

From:	Paul LePore
Sent:	Thursday, March 5, 2020 7:09 AM
To:	Deborah Helitzer (Dean)
Cc:	Jenny Smith
Subject:	Re: No conflict

Thank you Dean.

Sent from my iPhone

On Mar 5, 2020, at 6:43 AM, Deborah Helitzer (Dean) <Deborah.Helitzer@asu.edu> wrote:

Hi Paul - CHS has no conflict with the proposal of a Data Sciences BS degree with a Social Sciences track or the inclusion of the two BMI courses in the proposal. We do note that BMI 462 is not a regularly offered course.

Please let me know if you need anything else.

Warm regards
Deborah

Deborah Helitzer, ScD
Dean and Professor
College of Health Solutions
Arizona State University
550 N 3rd Street
Phoenix, AZ 85004
602.496.2511
deborah.helitzer@asu.edu
 Web: chs.asu.edu

For appointments and information, please
contact Daniel.Eckstrom (Daniel.Eckstrom@asu.edu)

Sent from my iPhone

From:	Paul LePore
Sent:	Tuesday, March 3, 2020 8:19 AM
To:	Ida Malian
Cc:	Jenny Smith
Subject:	RE: Data Sciences BS -- Social Sciences Track -- MLFTC

Thank you very much!

PAUL C. LEPORE, Ph.D.
Associate Dean
The College of Liberal Arts and Sciences
Armstrong Hall, Suite 152-H
1100 South McAllister Avenue
Arizona State University | P.O. Box 872601 | Tempe, Arizona 85287-2601
480.965.6506 | Fax: 480.965.2110 | e-mail: paul.lepore@asu.edu

ASU College of Liberal Arts and Sciences — *First Year Forward*

From: Ida Malian <IDA.MALIAN@asu.edu>
Sent: Tuesday, March 3, 2020 8:16 AM
To: Paul LePore <Paul.Lepore@asu.edu>
Subject: Re: Data Sciences BS -- Social Sciences Track -- MLFTC

Good Morning Paul,
On behalf of the Mary Lou Fulton Teachers College, I support the inclusion of our course EDP 454
"Statistical Data Analysis in Education" as an elective in the proposed new Data Sciences BS degree
within the Social Sciences track.
We look forward to our future collaborations,

Ida

Ida Malian PhD
Associate Dean of Academic Systems
Mary Lou Fulton Teachers College | Arizona State University
creating knowledge, mobilizing people and taking action to improve education

---

From: Paul LePore <Paul.Lepore@asu.edu>
Date: Tuesday, March 3, 2020 at 8:01 AM
To: Ida Malian <IDA.MALIAN@asu.edu>
Cc: Jenny Smith <jenny.smith@asu.edu>
Subject: RE: Data Sciences BS -- Social Sciences Track -- MLFTC

I think that is enough – thanks!

PAUL C. LEPORE, Ph.D.
Associate Dean
The College of Liberal Arts and Sciences
Armstrong Hall, Suite 152-H
1100 South McAllister Avenue
Arizona State University | P.O. Box 872601 | Tempe, Arizona 85287-2601
480.965.6506 | Fax: 480.965.2110 | e-mail: paul.lepore@asu.edu

ASU College of Liberal Arts and Sciences — *First Year Forward*

From: Ida Malian <IDA.MALIAN@asu.edu>
Sent: Tuesday, March 3, 2020 7:51 AM
To: Paul LePore <Paul.Lepore@asu.edu>
Subject: Re: Data Sciences BS -- Social Sciences Track -- MLFTC

Good Morning Paul-
The Dean approves. Is an email sufficient for support? Do you need her signature on the attached form as the other college?
Just checking.

Ida

From: Paul LePore <Paul.Lepore@asu.edu>
Date: Monday, March 2, 2020 at 6:34 PM
To: Carole Basile <Carole.Basile@asu.edu>, Ida Malian <IDA.MALIAN@asu.edu>
Cc: Paul LePore <Paul.Lepore@asu.edu>, Jenny Smith <jenny.smith@asu.edu>
Subject: Data Sciences BS -- Social Sciences Track -- MLFTC

March 2, 2020

Dear Deans Basile and Malian,

I am writing to ask if you would be willing to provide a letter of support for including the list of courses from your academic unit (see below) as electives in our new **Data Sciences BS degree (Social Sciences Track)**. The full degree proposal is included as a PDF attachment.

The **Data Sciences Degree, Social Sciences Track** electives build on the Social Sciences Research Methods Certificate – a degree that is currently approved, available, and already uses the courses below as part of that certificate program.

Courses:

* EDP 454 Statistical Data Analysis in Education

A short email to me and Jenny Smith would be much appreciated. I also am happy to discuss this request or the Data Sciences BS degree more generally.

Thank you,
Paul LePore

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From:	Christopher Boone
Sent:	Tuesday, March 3, 2020 8:59 AM
To:	Paul LePore
Cc:	Jenny Smith; Caroline Harrison; Nicole Darnall
Subject:	RE: Data Sciences BS -- Social Sciences Track -- Sustainability

The School of Sustainability is pleased to support the inclusion of the designated SOS courses as electives for the proposed Data Science BS degree.

Christopher Boone

Dean and Professor

ASU School of Sustainability

Arizona State University

P.O. Box 875502 | Tempe, Arizona | 85287-5502

PH: 480-965-2236 | Main: 480-965-2975
SchoolOfSustainability.asu.edu
Executive Assistant: Lorraine.Protocollo@asu.edu

The School of Sustainability embraces ASU's mission as being a comprehensive public research university, measured not by whom it excludes, but rather by whom it includes and how they succeed; advancing research and discovery of public value; and assuming fundamental responsibility for the economic, social, cultural and overall health of the communities it serves. We support and foster a culture of inclusiveness, tolerance, and respect that promotes equal opportunity and diversity among SOS faculty, staff, and students and through our engagement with diverse communities within and beyond the University.

From: Paul LePore <Paul.Lepore@asu.edu>
Sent: Monday, March 2, 2020 6:36 PM
To: Christopher Boone <Christopher.G.Boone@asu.edu>
Cc: Paul LePore <Paul.Lepore@asu.edu>; Jenny Smith <jenny.smith@asu.edu>
Subject: Data Sciences BS -- Social Sciences Track -- Sustainability

March 2, 2020

Dear Dean Boone,

I am writing to ask if you would be willing to provide a letter of support for including the list of courses from your academic unit (see below) as electives in our new **Data Sciences BS degree (Social Sciences Track)**. The full degree proposal is included as a PDF attachment.

The **Data Sciences Degree, Social Sciences Track** electives build on the Social Sciences Research Methods Certificate – a degree that is currently approved, available, and already uses the courses below as part of that certificate program.

Courses:

- SOS 211 Calculus and Probability for the Life and Social Sciences

1

A short email to me and Jenny Smith would be much appreciated. I also am happy to discuss this request or the Data Sciences BS degree more generally.

Thank you,
Paul LePore

PAUL C. LEPORE, Ph.D.
Associate Dean
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ASU College of Liberal Arts and Sciences — *First Year Forward*

From:	Paul LePore
Sent:	Wednesday, March 4, 2020 9:44 AM
To:	William Terrill
Cc:	Jenny Smith
Subject:	Re: Data Sciences BS -- Social Sciences Track -- Watts College

Thank you!

Sent from my iPhone

On Mar 4, 2020, at 9:41 AM, William Terrill <wcterrill@gmail.com> wrote:

> Good Morning Paul,
>
> The Watts College of Public Service and Community Solutions School of Criminal Justice is supportive of including CRJ 303 Statistical Analysis as an elective in your new Data Sciences BS degree (Social Sciences Track).
>
> Best, Bill

From: Paul LePore <Paul.Lepore@asu.edu>
Sent: Monday, March 2, 2020 6:31 PM
To: Cynthia Lietz <clietz@asu.edu>; Jonathan Koppell <koppell@asu.edu>
Cc: Paul LePore <Paul.Lepore@asu.edu>; Jenny Smith <jenny.smith@asu.edu>
Subject: Data Sciences BS -- Social Sciences Track -- Watts College

March 2, 2020

Dear Deans Koppell and Lietz,

I am writing to ask if you would be willing to provide a letter of support for including the list of courses from your academic unit (see below) as electives in our new **Data Sciences BS degree (Social Sciences Track)**. The full degree proposal is included as a PDF attachment.

The **Data Sciences Degree, Social Sciences Track** electives build on the <u>Social Sciences Research Methods Certificate</u> – a degree that is currently approved, available, and already uses the courses below as part of that certificate program.

Courses:

- CRJ 303 Statistical Analysis

A short email to me and Jenny Smith would be much appreciated. I also am happy to discuss this request or the Data Sciences BS degree more generally.

Thank you,
Paul LePore

PAUL C. LEPORE, Ph.D.
Associate Dean
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ASU College of Liberal Arts and Sciences — *First Year Forward*

William Terrill, PhD

Arizona State University

Interim Associate Dean, Watts College of Public Service and Community Solutions

Professor, School of Criminology & Criminal Justice

Co-Editor, *Policing: A Journal of Policy & Practice*

From:	Linda Lederman
Sent:	Tuesday, March 3, 2020 1:52 PM
To:	Paul LePore
Cc:	Paul Mongeau; Belle Edson; Jenny Smith
Subject:	Re: Data Sciences BS -- Social Sciences Track -- HDSHC Courses

Ok, then. As long as they have the prerequisites we are fine w offering them the option.
Best, Linda

Dr. Linda C. Lederman, Professor &Director, Hugh Downs School of Human Communication, Arizona State University

On Mar 3, 2020, at 1:44 PM, Paul LePore <Paul.Lepore@asu.edu> wrote:

Yes the prerequisites are required for the students to use these courses. Thanks

Sent from my iPhone

On Mar 3, 2020, at 1:41 PM, Linda Lederman <Linda.Lederman@asu.edu> wrote:

Hi Paul,

Thank you for inviting us to participate. In reviewing the courses I see that both have prerequisites. We insist on our students taking the prereqs to be sure they are prepared. We would have to do the same w these students. For that reason, I think we ought not have our courses listed. Would be happy to have them as options IF the students did the prereqs. I'm sure you understand.

Best,
Linda

Linda Costigan Lederman, Ph. D.
Professor and Director
Hugh Downs School of Human Communication
Arizona State University
2016 Gary Krahenbuhl Difference Maker Award
https://humancommunication.asu.edu/

From: Paul LePore <Paul.Lepore@asu.edu>
Sent: Monday, March 2, 2020 6:26 PM
To: Linda Lederman <Linda.Lederman@asu.edu>; Paul Mongeau <Paul.Mongeau@asu.edu>; Belle Edson <bedson@asu.edu>

1

March 2, 2020

Dear Linda, Paul, and Belle,

I am writing to ask if you would be willing to provide a letter of support for including the list of courses from your academic unit (see below) as electives in our new **Data Sciences BS degree (Social Sciences Track)**. The full degree proposal is included as a PDF attachment.

The **Data Sciences Degree, Social Sciences Track** electives build on the Social Sciences Research Methods Certificate – a degree that is currently approved, available, and already uses the courses below as part of that certificate program.

Courses:

- COM 308 Advanced Research Methods in Communication
- COM 407 Advanced Critical Methods in Communication

A short email to me and Jenny Smith would be much appreciated. I also am happy to discuss this request or the Data Sciences BS degree more generally.

Thank you,
Paul LePore

PAUL C. LEPORE, Ph.D.
Associate Dean
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ASU College of Liberal Arts and Sciences — *First Year Forward*

From:	Cameron Thies
Sent:	Tuesday, March 3, 2020 9:19 AM
To:	Paul LePore
Cc:	Jenny Smith; Magda Hinojosa
Subject:	Re: Data Sciences BS -- Social Sciences Track -- SPGS

Dear Paul,

SPGS supports the addition of POS 301/SGS 305 and POS 401/SGS 401 to the Social Sciences Track of the Data Sciences degree. Thanks for including us!

Best,
Cameron

Cameron G. Thies
Professor and Director
School of Politics and Global Studies
Arizona State University

From: Paul LePore <Paul.Lepore@asu.edu>
Date: Monday, March 2, 2020 at 6:37 PM
To: Cameron Thies <CAMERON.THIES@asu.edu>, Hinojosa Magda <Magda.Hinojosa@asu.edu>
Cc: Jenny Smith <jenny.smith@asu.edu>, Paul LePore <Paul.Lepore@asu.edu>
Subject: Data Sciences BS -- Social Sciences Track -- SPGS

March 2, 2020

Dear Cameron and Magda,

I am writing to ask if you would be willing to provide a letter of support for including the list of courses from your academic unit (see below) as electives in our new **Data Sciences BS degree (Social Sciences Track)**. The full degree proposal is included as a PDF attachment.

The **Data Sciences Degree, Social Sciences Track** electives build on the Social Sciences Research Methods Certificate – a degree that is currently approved, available, and already uses the courses below as part of that certificate program.

Courses:

- POS 301/SGS 305 Empirical Political Inquiry
- POS 401/SGS 401 Political Statistics

A short email to me and Jenny Smith would be much appreciated. I also am happy to discuss this request or the Data Sciences BS degree more generally.

Thank you,
Paul LePore

PAUL C. LEPORE, Ph.D.
Associate Dean
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480.965.6506 | Fax: 480.965.2110 | e-mail: paul.lepore@asu.edu

ASU College of Liberal Arts and Sciences — *First Year Forward*

From:	Kathryn Maxwell
Sent:	Monday, March 9, 2020 1:36 PM
To:	Paul LePore
Cc:	Jenny Smith
Subject:	Re: Data Sciences BS -- Social Sciences Track -- Herberger, The Design School

Hi Paul,

The Herberger Institute approves of the new Data Sciences BS degree and the inclusion of the ALA 235 course, offered by The Design School, in the Social Sciences track of the degree.

Best,

Kathryn

Kathryn Maxwell
Associate Dean for Student Success
Professor of Printmaking

ASU Herberger Institute for Design and the Arts
Dixie Gammage Hall, Rm. 132
PO Box 872102
Tempe, AZ 85287-2102
p: 480.965.0050
f: 480.727.6529

From: Paul LePore <Paul.Lepore@asu.edu>
Date: Monday, March 9, 2020 at 1:01 PM
To: kathrynm <K.Maxwell@asu.edu>
Cc: Jenny Smith <jenny.smith@asu.edu>
Subject: Data Sciences BS -- Social Sciences Track -- Herberger, The Design School

Hi Kathryn,

Have you and Dean Tepper been able to review the request below.

Is there someone I should send this to in addition to the two of you?

Thanks!
PL

PAUL C. LEPORE, Ph.D.
Associate Dean
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480.965.6506 | Fax: 480.965.2110 | e-mail: paul.lepore@asu.edu

From: Paul LePore <Paul.Lepore@asu.edu>
Sent: Monday, March 2, 2020 6:29 PM
To: Steven Tepper (Dean) <Steven.Tepper@asu.edu>; Kathryn Maxwell <K.Maxwell@asu.edu>
Cc: Paul LePore <Paul.Lepore@asu.edu>; Jenny Smith <jenny.smith@asu.edu>
Subject: Data Sciences BS -- Social Sciences Track -- Herberger, The Design School

March 2, 2020

Dear Deans Tepper and Maxwell,

I am writing to ask if you would be willing to provide a letter of support for including the list of courses from your academic unit (see below) as electives in our new **Data Sciences BS degree (Social Sciences Track)**. The full degree proposal is included as a PDF attachment.

The **Data Sciences Degree, Social Sciences Track** electives build on the <u>Social Sciences Research Methods Certificate</u> — a degree that is currently approved, available, and already uses the courses below as part of that certificate program.

Courses:

- ALA 235 Introduction to Computer Modeling

A short email to me and Jenny Smith would be much appreciated. I also am happy to discuss this request or the Data Sciences BS degree more generally.

Thank you,
Paul LePore

PAUL C. LEPORE, Ph.D.
Associate Dean
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480.965.6506 | Fax: 480.965.2110 | e-mail: <u>paul.lepore@asu.edu</u>

ASU College of Liberal Arts and Sciences — *First Year Forward*

From:	Kaye Reed
Sent:	Monday, March 9, 2020 1:10 PM
To:	Paul LePore
Cc:	Jenny Smith
Subject:	Re: Data Sciences BS -- Social Sciences Track -- SHESC

Dear Paul,

Yes, we are very supportive of your degree and including these courses. Sorry for the delay, just came out of the field and can now answer.

Best,
Kaye

Sent from my iPhone

On Mar 9, 2020, at 11:04 PM, Paul LePore <Paul.Lepore@asu.edu> wrote:

Hi Kaye,

Any thoughts on the request below? Would you be able to write a short email of support for including the SHESC courses below as possible electives in the Data Science BS Social Sciences Track?

Thanks!
PL

PAUL C. LEPORE, Ph.D.
Associate Dean
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480.965.6506 | Fax: 480.965.2110 | e-mail: paul.lepore@asu.edu

ASU College of Liberal Arts and Sciences — *First Year Forward*

From: Paul LePore <Paul.Lepore@asu.edu>
Sent: Monday, March 2, 2020 6:38 PM
To: Kaye Reed <kaye.reed@asu.edu>
Cc: Paul LePore <Paul.Lepore@asu.edu>; Jenny Smith <jenny.smith@asu.edu>
Subject: Data Sciences BS -- Social Sciences Track -- SHESC

March 2, 2020

Dear Kaye,

I am writing to ask if you would be willing to provide a letter of support for including the list of courses from your academic unit (see below) as electives in our new **Data Sciences BS degree (Social Sciences Track)**. The full degree proposal is included as a PDF attachment.

The **Data Sciences Degree, Social Sciences Track** electives build on the <u>Social Sciences Research Methods Certificate</u> – a degree that is currently approved, available, and already uses the courses below as part of that certificate program.

Courses:

- AML 253 Introduction to Mathematical Tools and Modeling for the Life and Social Sciences
- AML 441 Mathematical Concepts and Tools in Sustainability
- ASM 494 Models in Social Evolution

A short email to me and Jenny Smith would be much appreciated. I also am happy to discuss this request or the Data Sciences BS degree more generally.

Thank you,
Paul LePore

PAUL C. LEPORE, Ph.D.
Associate Dean
The College of Liberal Arts and Sciences
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ASU College of Liberal Arts and Sciences — *First Year Forward*

<Data Science BS 2-27-20.pdf>

February 13, 2019

To: Dr. Paul LePore, Associate Dean, CLAS (and Ms. Jenny Smith, Assistant)
From: Al Boggess, Director, School of Mathematical and Statistical Sciences
Re: Proposed degree in Data Science

This is a strong letter of support for the proposed degree in Data Science. This degree will add value to the university community through its unique interdisciplinary approach that involves coursework in mathematics, statistics, and computer science. In addition, this degree program will require an area of concentration where data science tools are used to help with quantitative and/or visual modeling, inference, and prediction. Students who complete this program will emerge as skilled data analysts. The School of Mathematical & Statistical Sciences is prepared, with support from CLAS and the Provost's office, to staff and administer this program.

The Data Science program will also be the first program in SOMSS that is being developed for ASU Online implementation. After developing and establishing the on-ground program for fall of 2020, we look forward to being able to serve a wider population of students with this degree in the fall of 2021.

This degree has the support of our undergraduate program committee, which is charged with overseeing the undergraduate programs and course offerings within SOMSS as consistent with our bylaws.

Attached is the full program proposal that includes the major map and assessment plans. Please let me know if you have any questions or concerns about this proposed degree.

Cc: Don Jones, Associate Professor

School of Mathematical and Statistical Sciences College of Liberal Arts and Sciences
Charles Wexler Hall | 901 South Palm Walk | PO Box 871804 | Tempe, AZ 85287-1804
phone: 480-965-3951 | web: math.asu.edu

9 September 2019

To Whom it May Concern:

The School of Computing, Informatics, and Decision Systems Engineering in the Fulton Schools of Engineering supports the creation of the proposed Data Science Degree in the College of Liberal Arts and Sciences. We believe the proposed program will increase opportunities for our students without negatively impacting the current programs and we are looking forward to working with you on this degree program.

Sincerely,

Jeremy Helm
Senior Director, Academic and Student Affairs

From:	Nancy Gonzales
Sent:	Tuesday, November 26, 2019 12:19 PM
To:	Todd Sandrin (DEAN)
Cc:	Paul LePore; Jenny Smith; Michelle Watson
Subject:	Re: RE: Request a Statement of Collaboration and Impact -- BS in Data Science

Thanks for your supportive statement, Todd. I agree there are opportunities for collaboration and will make sure to forward you suggestions to the team leading this in SoMSS.

Nancy

From: Todd Sandrin (DEAN) <Todd.Sandrin@asu.edu>
Sent: Tuesday, November 26, 2019 12:04 PM
To: Nancy Gonzales <nancy.gonzales@asu.edu>
Cc: Paul LePore <Paul.Lepore@asu.edu>; Jenny Smith <jenny.smith@asu.edu>; Michelle Watson <Michelle.Watson@asu.edu>
Subject: RE: Request a Statement of Collaboration and Impact -- BS in Data Science

Dear Nancy,

Thanks for your email and request. New College supports development of the proposed undergraduate degree, Bachelor of Science in Data Science.

My team and I believe there are opportunities to coordinate and collaborate here, particularly with regard to aligning pre-requisites and listing/inclusion of relevant courses (e.g., STP 420). A couple of additional courses (STP 310, 311, and STP 450) might further enhance the degree program. I append below a note from our School of Mathematical and Natural Sciences with additional details.

New College is also working to develop a distinctive degree in Data and Society that will be wonderfully complemented by the BS in Data Science proposed here. The Data and Society degree will seek to provide students, in part, with an understanding of the ways in which data science may be applied to address social issues and to provide for entrepreneurial pro-social outcomes. The Data and Society degree will represent embedded use of data science. By necessity, it will not be as methodologically driven as the Data Science degree program envisioned here. Our focus will not be broadly on the methodology, but rather on what it means to the rapidly changing social sciences. As such, I suspect the two programs will complement one another nicely, with students primarily interested in the social sciences majoring in Data & Society and taking courses in Data Science, and those primarily with a methodological interest majoring in Data Science.

Best regards,
Todd

Todd R. Sandrin, Ph.D.
Dean, New College of Interdisciplinary Arts and Sciences
Vice Provost, West campus

Professor, School of Mathematical and Natural Sciences
Senior Sustainability Scientist - Julie Ann Wrigley Global Institute of Sustainability

ASU New College
of Interdisciplinary Arts and Sciences
Arizona State University

From our School of Mathematical and Natural Sciences:

They did send impact statements for each DAT course. One of them, Machine Learning, is the same as one of ours, and we had mentioned in that statement, and that we had hoped to be able to cross-list those two. We would like the opportunity to discuss how to align pre-reqs so that students could take either option.

The Math track excludes our courses STP 310 and 311, which we think would be useful. Also, just noting STP 429 has a prerequisite of STP 420, yet STP 420 is not listed.
STP310/311 ARE included in the Social Science track. We also think that STP 450 - Nonparametric statistics should be included in this track. This course covers modern nonparametric statistics that are covered in many DAT courses (regression trees, etc..)
The Behavioral science track includes STP 452 as an advanced statistics course, but STP 450 would, in my opinion, be just as good a course to offer, and we would like to add it.

From: Nancy Gonzales <nancy.gonzales@asu.edu>
Sent: Tuesday, November 19, 2019 8:52:55 PM
To: Todd Sandrin (DEAN) <Todd.Sandrin@asu.edu>
Cc: Paul LePore <Paul.Lepore@asu.edu>; Jenny Smith <jenny.smith@asu.edu>; Michelle Watson <Michelle.Watson@asu.edu>
Subject: FW: Request a Statement of Collaboration and Impact -- BS in Data Science

Dear Todd
The College of Liberal Arts and Sciences is requesting a Statement of Collaboration and Impact for the following proposed undergraduate degree: Bachelor of Science in Data Science.
We would be grateful if New College could include a statement describing the opportunities for cross-university collaboration and optimization presented by this new program. How will the new program provide opportunities or areas for growth within the university? In what areas do you anticipate that there may be duplication of efforts or negative impact on your college?
Please also include a statement of support (or not) for the proposal.
Thank you for considering this request.
Nancy
Nancy A. Gonzales
Dean of Natural Sciences
Foundation Professor of Psychology
The College of Liberal Arts and Sciences
Arizona State University