THE UNIVERSITY OF ARIZONA

UNDERGRADUATE EMPHASIS (SUB-PLAN) REQUEST FORM
MAJORS WITHOUT EXISTING EMPHASES (SUB-PLANS)

Requests for the creation of a new emphasis requires approval from the school director/department head (managing administrator), college academic dean, Curricular Affairs, Undergraduate Council (UGC), and College Academic Administrators Council (CAAC). Complete this form (for each proposed emphasis) and submit to the Office of Curricular Affairs, no later than January 31, 2021 to be considered for inclusion in the 2021-2022 Academic Catalog.

I. **Requested by (College & School/Department): Social and Behavioral Sciences, School of Information**

II. **Proposer's name, title, email and phone number: Dr. Catherine Brooks cfbrooks@arizona.edu 520-621-3565**

III. **Degree, major and number of students currently enrolled in the major (include dual majors): Enrolled in term: 248; including not enrolled in term,** 274

IV. **Total number of students that have completed the major in past 3 years: 214**

V. **Minimum number of units required to complete the major (do not include foundation, general education, general electives or supporting coursework): 45**

VI. **Name of the proposed emphasis: Data Science**

VII. **Campus and location offering**-check the campus(es) and location(s) where this emphasis will be offered.

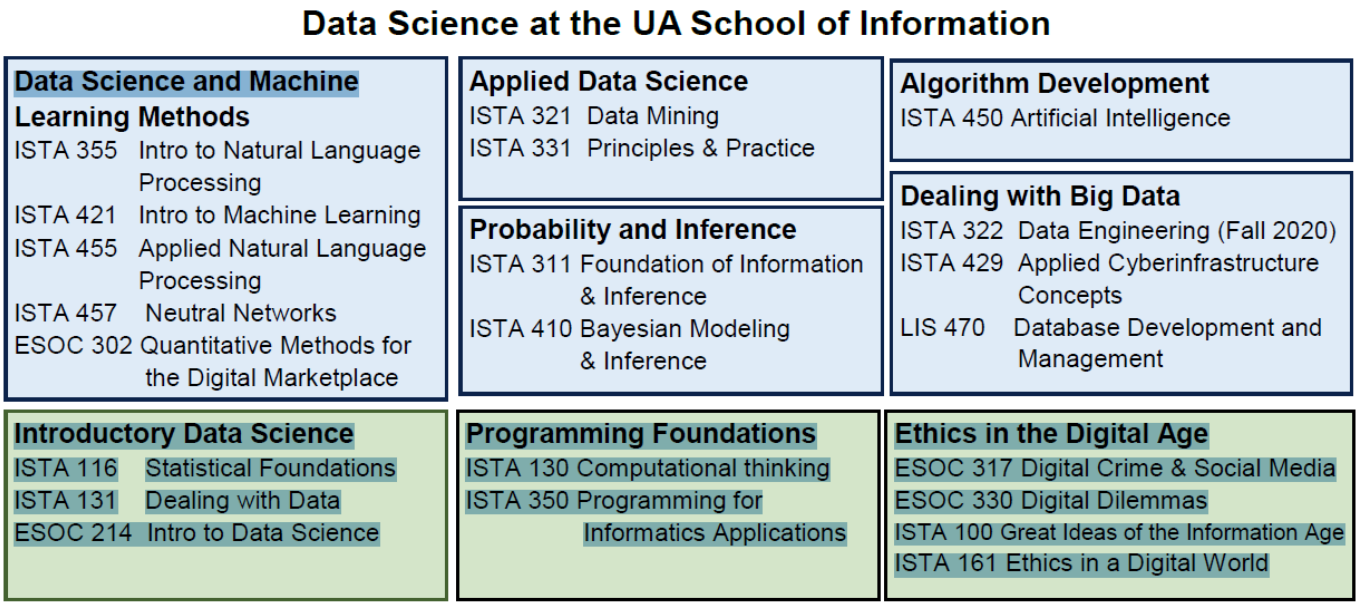
■ **Main**	☐ UA Online	☐ Phoenix Biomedical	☐ Distance (type in location(s) below):

VIII. **Provide a rationale for the proposed new emphasis. Survey your current majors to provide evidence of student interest in/demand for the proposed emphasis – attach the survey questions and results at the end of this proposal. Write a short summary of the findings of the survey. You may also include external data (Bureau of Labor Statistics, reports/letters of support from relevant bodies, etc.). Curricular Affairs can provide a job posting/demand report by skills obtained/outcomes of the proposed emphasis. Please contact Office of Curricular Affairs to request the report for your proposal.**

Students in Information Sciences learn key introductory skills in data science, but they also study *information* beyond data, studying the ethics of information use, as well as programming foundations to apply their data science skills to real-world problems. Ultimately, as part of the College of Social and Behavioral Sciences, Information Science students learn how data is used and abused *by people* as well as the applications and intersections between information, people, and technology.

With the **Data Science** sub plan, students will build beyond their core classes to develop more advanced skills in data science and the crucial ways that data science can used in the real world, including Applied Data Science classes such as Data Mining, Principles and Practices of Data Science; uses for Big Data, such as Data Engineering, Database Development; Applied Cyber Infrastructure concepts, as well as

applications to Machine Learning and Algorithm Development. While still a degree about Information, in the Data Science Sub-plan, students will have key technical skills in applied data science.



The McKinsey institute estimated that by 2018, there'd be shortage of nearly 200,000 workers with "deep analytical skills" regarding Big Data: https://www.mckinsey.com/business-functions/mckinsey-digital/our-insights/big-data-the-next-frontier-for-innovation#

According to the Bureau of Labor Statistics, **Data Scientists** and **Information Security analysts** are projected fast-growing professions, https://www.bls.gov/emp/tables/fastest-growing-occupations.htm

There's a projected 27 percent https://www.bls.gov/opub/btn/volume-7/big-data-adds-up.htm rise in employment in the field of Data Science, and it's also been rated the number one job in the US for four years in a row by Glassdoor: https://www.businessinsider.com/best-jobs-in-america-2019-1

Crucially, according to McKinsey, there's not only just a need for data scientists, but also "1.5 million managers and analysts with the know-how to use the analysis of big data to make effective decisions": https://www.mckinsey.com/business-functions/mckinsey-digital/our-insights/big-data-the-next-frontier-for-innovation#

In the **Data Science** sub-plan, students can position themselves for jobs **as Data Analysts**. As this article from Northwestern notes on the difference between data scientists and data analysts: https://www.northeastern.edu/graduate/blog/data-analytics-vs-data-science/ data analysts require **the skills to translate their quantitative findings for a non-technical audience**, skills honed in our core, society, and research methods classes. All of our students learn the basic technical skills recommended in this article for data analysis, such as R (ISTA 116) and Python (ISTA 130), **but in the Applied Data Science sub-plan, they can hone advanced and applied skills in Programming (ISTA 350), Data Mining (ISTA 321), Data Engineering (ISTA 322), and more.**

The Data Science sub-plan can also provide an excellent foundation for an advanced degree in Information or Data Science. This would be the sub-plan recommended for students interested in applying to our Master's in Information, or Accelerated MS: https://ischool.arizona.edu/accelerated-ms-program

A distinction between our sub-plan and the existing degree in Statistics and Data Science is the core of Information Science beyond data, as well as the focus on *applied* Data Science as well as a lower math requirement and lesser focus on statistics.

Survey questions and results attached to this proposal. In summary, 75% of students survey agreed they wanted to know more about a career in data science, and 73% agreed they wanted a more specific career focus in the curriculum. 60% said they would have been more likely to declare the major if there had been sub-plans, with 32% neutral and less than 8% disagreeing.

IX. At minimum, provide two unique learning outcomes for the proposed emphasis. Which courses in the emphasis will Introduce, Practice, and/or Assess the learning outcomes? Use the table below to provide the information. Add rows as needed.

Learning Outcome	Introduced	Practiced	Assessed
Clean, transform, and analyze data sets using advanced methods of discovery, assessment, engineering, and analysis	ISTA 116, 130, 131	ISTA 311, 321, 320, 320, 331, 350, 429	ISTA 498
Apply data analysis methodologies to address real-world problems with individually and collaboratively proposed solutions.	ISTA 116, 130, 131	ISTA 321, 320, 320, 331, 350, LIS 470	ISTA 498

X. Requirements to meet 40% commonality across emphases. ABOR Policy 2-221-c. Academic Degree Programs Subspecializations requires all emphases within a major to share at least 40% curricular commonality across emphases (known as "major core"-courses counting towards major units and major GPA). List the required major core curriculum required of all emphases. Refer to your existing advisement report(s), if needed. Include the prefix, course number, course title and number of units. Add rows as needed.

Requirement Title/Description	Courses (include prefix, number, title, units)	Minimum units needed to satisfy requirement

Major Core	1. ISTA 100: Great ideas of the Information Age (3 units) 2. ISTA 116: Statistical Foundations of the Information Age (3 units) 3. ISTA 130: Computational Thinking and Doing (4 units) 4. ISTA 131: Dealing with Data (4 units) 5. ISTA 161: Ethics in a Digital World (3 units)	15 (17 but transfer credit is accepted, minimum set at 15)
Required for all majors	1. ESOC 302: Quantitative Research methods (3 units)	3 units
Required for all majors	Choose one Society course: • ESOC 313: Digital Discourse and Identity (3 Units) • ESOC 314: Theories of New Media (3 Units) • ESOC 315: Publishing – From Papyrus to e-Readers (3 Units) • ESOC 316: Digital Commerce (3 Units) • ESOC 317: Digital Crime and Social Media (3 Units) • ESOC 318: Disruptive Technologies (3 Units) • ESOC 319: Instructions Technologies (3 units) • ESOC 330: Digital Dilemmas – Privacy, Property, and Access (3 Units) • ESOC 477: Information Security (3 Units) • ESOC 478: Science Information and its Presentations (3 units) • ESOC 495: Special Topics (3 Units)	3 units
Required for all majors	Choose one Computational Arts & Media (3 units total): • ART/FA 432A: Interactivity (3 Units) • ART/FA 437A: Foundation Digital 3D Modeling, Rendering and Rapid Protyping (3 Units) • ESOC 300: Digital Storytelling and Culture (3 Units) • ESOC 340: Information, Multimedia Design and the Moving Image (3 Units) • ISTA 230: Introduction to Web Design and Development (3 Units) • ISTA 251: Introduction to Game Design (3 Units) • ISTA 301: Computing and the Arts (3 Units) • ISTA 302: Technology of Sound (3 Units) • ISTA 303: Introduction to Creative Coding (3 Units) • LING 388: Language and Computers (3 Units)	3 units
Required for all majors	ISTA 498: Senior Capstone (3 units)	3 units
Required for all majors	Engagement requirement (Choose one): ESOC 480: Digital Engagement (3 units) INFO 499: Independent study (3 units) INFO 493: Internships (3 units) INFO 492: Directed Research (3 units) ISTA 491: Preceptorship (3 units)	3 units
	Total major core upper division units required	12
	Total major core units required	30

XI. **Requirements specific to the proposed emphasis. List the required emphasis core, electives, and any special conditions students must meet to complete the emphasis using the table below. Include the prefix, course number, course title, and units for each course. Provide email(s)/letter(s) of support from home department head(s) for courses not owned by your department. Highlight and label (NEW) any new courses that must be developed for the emphasis. Add rows as needed.**

Note: a proposed emphasis having similar curriculum with other plans (within department, college, or university) may require completion of a comparison chart. Total units required for each emphasis must be equal.

Requirement Title/Description	Courses (include prefix, number, title, units)	Minimum units needed to satisfy requirement
Emphasis core	Complete 5 courses (15 units minimum) • ISTA 311: Foundation of Information and Inference (3 Units) • ISTA 321: Data Mining and Discovery (3 Units) • ISTA 320: Data Visualization (3 units) • ISTA 322: Data Engineering (3 Units) • ISTA 331: Principles and Practice of Data Science (3 Units) • ISTA 350: Programming for Informatics Applications (4 Units) • ISTA 355: Introduction to Natural Language Processing (3 Units) • ISTA 410: Bayesian Modeling and Inference (3 Units) • ISTA 421: Introduction to Machine Learning (3 Units) • ISTA 429: Applied Cyberinfrastructure Concepts (3 Units) • ISTA 439: Statistical Natural Language Processing (3 Units) • ISTA 450: Artificial Intelligence (3 Units) • ISTA 455: Applied Natural Language Processing (3 Units) • ISTA 456: Text Retrieval and Web Search • ISTA 457: Neural Networks (3 Units) • LIS 470: Database Development and Management (3 Units) • GEOG 417: Geographic Information Systems for Natural and Social Sciences (3 Units) • ISTA 495: Special Topics (3 units) • ISTA 497: Biodiversity Informatics (3 units)	15
	Total emphasis upper division units required	12
	Total major emphasis units required*	15

***All emphases offered for this major must have the same minimum number of units required**

XII. Emphasis course/faculty information for existing courses. Complete the table below for all emphasis coursework. You can find information to complete the table using the UA course catalog or UAnalytics (Catalog and Schedule Dashboard> "Printable Course Descriptions by Department" On Demand Report; right side of screen). Provide email(s)/letter(s) of support from home department head(s) for courses not owned by your department. Add rows as needed. .

Course prefix and number	Title	Course Description	Pre-requisites	Typically Offered (F, Sp, Su, W) and Frequency (every year, odd years, etc.)	Home Department	Faculty members available to teach the courses
ISTA 311	Foundation of Information and Inference (3 Units)	An introduction to the mathematical theories of probability and information as tools for inference, decision-making, and efficient communication. Topics include discrete and continuous random variables, measures of information and uncertainty, discrete time/discrete state Markov chains, elements of Bayesian inference and decision-making, Bayesian and Maximum Likelihood parameter estimation, and elementary coding theory.	ISTA 130 and ISTA 116	Typically offered Fall and Spring, every year	School of Information	Dylan Murphy, Lecturer
ISTA 321	Data Mining and Discovery (4 Units)	This course will introduce students to the theory and practice of data mining for knowledge discovery. This includes methods developed in the fields of statistics, large-scale data analytics, machine learning and artificial intelligence for automatic or semi-automatic analysis of large quantities of data to extract previously unknown interesting patterns. Topics include understanding varieties of data, classification, association rule analysis, cluster analysis, and anomaly detection. We will use software packages for data mining, explaining the underlying algorithms and their use and limitations. The course includes laboratory exercises, with data mining case studies using data from biological sequences and networks, social networks, linguistics, ecology, geo-spatial applications, marketing and psychology.	ISTA 116 or ESOC 214	Typically offered Fall, Spring and Summer, every year	School of Information	Nick DiRienzo, Adriana Picoral
ISTA 320	Data Visualization (3 units)	This course will introduce students to the fundamental concepts and tools used to convey the information contained within large, complex data sets through a variety of visualization techniques. Students will learn the fundamentals of data exploration data via visualizations, how to manipulate and reshape data to make it suitable for visualization, and how to prepare everything from simple single-variable visualizations to large multi-tiered and interactive visualizations. Visualization theory will be presented alongside the technical aspect of the course to develop a holistic understanding of the topic.	ISTA 116 or ESOC 214	Typically offered Fall and Spring, every year	School of Information	Adriana Picoral, Megan Wetherell, Nick DiRienzo

ISTA 322	Data Engineering (3 Units)	This course will be inviting for a wide variety of students from across disciplines, and they will learn how to use industry standard tools and practices to make large data sets usable for scientists and other decision makers. From data collection and preparation, to the creation of big data stores, databases, or systems to make data flow, this course will focus on the practical work needed to prepare big data for analyses across contexts. Students will be introduced to a variety of technical tools for data management, storage, use, and manipulation.	ISTA 130	Typically offered Fall and Spring, every year	School of Information	Nick DiRienzo, Adriana Picoral
ISTA 331	Principles and Practice of Data Science (3 Units)	This course surveys the techniques central to the modern practice of extracting useful patterns and models from large bodies of data and the theory behind these techniques. Students will learn the purpose, power, and limitations of models, with concrete examples from business and science. Course subject matter may include classification and regression, supervised segmentation and decision trees, similarity/distance metrics and recommender systems, clustering and nearest neighbors, support vector machines, understanding and avoiding overfitting, natural language processing and sentiment analysis, machine learning, neural networks, and AI, and logistic regression.	ISTA 116, 130, 131	Typically offered Fall and Spring, every year	School of Information	Dylan Murphy, Rich Thompson, Nick DiRienzo, Adriana Picoral, Megan Wetherell
ISTA 350	Programming for Informatics Applications (4 Units)	This course will provide an introduction to informatics application programming using the python programming language and applying statistical concepts from a first semester statistics course. A key goal of this course is to prepare students for upper division ISTA courses by expanding on the skills gained in ISTA 116 and 130 but will be broadly applicable to any informatics discipline. Throughout the semester students will be faced with information application problems drawn from several different disciplines in order to expand their breadth of experience while simultaneously increasing their depth of knowledge of scientific and informatics programming methods. Students will practice problem decomposition and abstraction, gaining experience in identifying commonly occurring information processing issues and in applying well-known solutions. In addition, students will design their own algorithmic solutions to problems and will learn how to effectively compare different solutions, evaluating efficiency in order to choose the best solution for a given problem. Periodic code reviews will be held in order to expose students to a range of different solution methods, which will aid them in discovering weaknesses in their own work and will improve their ability to communicate with others on technical topics. The course will include an introduction to the python scientific computing libraries and other statistical packages. Additional course topics will include the use of version control systems, software profiling, general software engineering practices and basic shell scripting.	ISTA 116, 130, 131	Typically offered Fall and Spring, every year	School of Information	Rich Thompson
ISTA 355	Introduction to Natural Language	Natural language processing (NLP) is the study of how we can teach computers to use language by extracting knowledge from text, and then use that knowledge in some meaningful way. In this introductory course, we will examine the fundamental components on which natural language processing systems are built,	ISTA 350 or CSC 345. Must	Typically offered Fall, Main campus	School of Information	Peter Jansen, Steven Bethard

	Processing (3 Units)	including frequency distributions, part of speech tagging, syntactic parsing, semantics and analyzing meaning, search, introductory information and relation extraction, and structured knowledge resources. We will also examine pragmatic concerns in processing raw text from real-world sources.	have not taken LING/CSC 439/539			
ISTA 410	Bayesian Modeling and Inference (3 Units)	Bayesian modeling and inference is a powerful modern approach to representing the statistics of the world, reasoning about the world in the face of uncertainty, and learning about it from data. It cleanly separates the notions of representation, reasoning, and learning. It provides a principled framework for combining multiple source of information such as prior knowledge about the world with evidence about a particular case in observed data. This course will provide a solid introduction to the methodology and associated techniques, and show how they are applied in diverse domains ranging from computer vision to molecular biology to astronomy.	(MATH 223 and MATH 313 and MATH 464; and (ISTA 350 or CSC 345)) OR ISTA 421 OR Consent of instructor	Typically offered Spring, Main campus	School of Information	Dylan Murphy, Clayton Morrison
ISTA 421	Introduction to Machine Learning (3 Units)	Machine learning describes algorithms which can modify their internal parameters (i.e., "learn") to recognize patterns and make decisions based on examples or through interaction with the environment. This course will introduce the fundamentals of machine learning, will describe how to implement several practical methods for pattern recognition, feature selection, clustering, and decision making for reward maximization, and will provide a foundation for the development of new machine learning algorithms.	ISTA 311, MATH 129, and MATH 313, or equivalent, or consent of instructor.	Typically offered Fall, Main Campus		Clayton Morrison
ISTA 429 (BE 429, PLS 429)	Applied Cyberinfrastructure Concepts (3 Units)	Students will learn from experts from projects that have developed widely adopted foundational Cyberinfrastructure resources, followed by hands-on laboratory exercises focused around those resources. Students will use these resources and gain practical experience from laboratory exercises for a final project using a data set and meeting requirements provided by domain scientists. Students will be provided access to computer resources at: UA campus clusters,		Typically offered Fall, Main Campus	School of Information?	Stephen Bethard, course crosslisted with BE

		iPlant Collaborative and at NSF XSEDE. Students will also learn to write a proposal for obtaining future allocation to large scale national resources through XSEDE.				and PLS, typically taught by Nirvav Merchant and Eric Lyons
ISTA 439 (CSC 439, LING 439)	Statistical Natural Language Processing (3 Units)	This course introduces the key concepts underlying statistical natural language processing. Students will learn a variety of techniques for the computational modeling of natural language, including: n-gram models, smoothing, Hidden Markov models, Bayesian Inference, Expectation Maximization, Viterbi, Inside-Outside Algorithm for Probabilistic Context-Free Grammars, and higher-order language models.		Typically offered Fall, Main Campus	Linguistics	Steven Bethard, course owned by Linguistics, also taught by Linguistics faculty
ISTA 450	Artificial Intelligence (3 Units)	The methods and tools of Artificial Intelligence used to provide systems with the ability to autonomously problem solve and reason with uncertain information. Topics include: problem solving (search spaces, uninformed and informed search, games, constraint satisfaction), principles of knowledge representation and reasoning (propositional and first-order logic, logical inference, planning), and representing and reasoning with uncertainty (Bayesian networks, probabilistic inference, decision theory).	ISTA 350 or CSC 245 or MATH 243 or equivalent or consent of instructor.	Typically offered Spring, Main Campus	School of Information	Clayton Morrison
ISTA 455	Applied Natural Language Processing (3 Units)	Most of web data today consists of unstructured text. This course will cover the fundamental knowledge necessary to organize such texts, search them a meaningful way, and extract relevant information from them. This course will teach natural language processing through the design and development of end-to-end natural language understanding applications, including sentiment analysis (e.g., is this review positive or negative?), information extraction (e.g., extracting named entities and their relations from text), and question answering (retrieving exact answers to natural language questions such as "What is the capital of France" from large document collections). We will use several natural language processing toolkits, such as NLTK and Stanford's CoreNLP. The main programming	ISTA 350 or CSC 345	Typically offered Spring, Main Campus	School of Information	Steven Bethard, Peter Jansen, Clayton Morrison

		language used in the course will be Python, but code written in Java or Scala will be accepted as well.				
ISTA 456	Text Retrieval and Web Search (3 units)	Most of the web data today consists of unstructured text. Of course, the fact that this data exists is irrelevant, unless it is made available such that users can quickly find information that is relevant for their needs. This course will cover the fundamental knowledge necessary to build such systems, such as web crawling, index construction and compression, boolean, vector-based, and probabilistic retrieval models, text classification and clustering, link analysis algorithms such as PageRank, and computational advertising. The students will also complete one programming project, in which they will construct one complex application that combines multiple algorithms into a system that solves real-world problems.	ISTA 350 and MATH 313 (Linear Algebra) or equival ent or consent of instruct or	Typically offered Fall, main Campus Not offered since 2014	School of Infor matio n	Steven Bethard , Peter Jansen
ISTA 457	Neural Networks (3 units)	Neural networks are a branch of machine learning that combines a large number of simple computational units to allow computers to learn from and generalize over complex patterns in data. Students in this course will learn how to train and optimize feed forward, convolutional, and recurrent neural networks for tasks such as text classification, image recognition, and game playing.	ISTA 350 or CSC 345 or NSCS 344, or ECE 275 or equival ent, or consent of instruct or.	Typically offered Fall, Spring, Main Campus	School of Infor matio n	Steven Bethard , Peter Jansen
LIS 470	Database Development and Management (3 units)	This course covers theory, methods, and techniques widely used to design and develop a relational database system and students will develop a broad understanding of modern database management systems. applications of fundamental database principles in a stand-alone database environment using MS Access and Windows are emphasized. Applications in an Internet environment will be discussed using MySQL in the Linux platform.		Typically offered Fall, Main Campus (now also offered in Spring)	School of Infor matio n	Bruce Fulton, Ryan Rucker
GEOG 417	Geographic Information Systems for Natural and Social	Introduction to the application of GIS and related technologies for both the natural and social sciences. Conceptual issues in GIS database design and development, analysis, and display.		Typically offered Fall, Spring, Summer, Main and	School of Geogr aphy	Housed is School of Geogra phy

	Sciences (3 Units)			Online campus		
ISTA 495	Special Topics (3 units)	Special topics courses are offered to allow students to explore specialized topics not covered in the program curriculum. Multiple topics might be offered in any given year, and specialized topic descriptions will be advertised by the School for students interested in enrolling in the course. A specific course syllabus will be published prior to the offer of a special topic course.		Main campus, regularly offered Fall and Spring	School of Information	Various faculty, rotates
ISTA 497	Biodiversity Informatics	Modern science has always been data driven but advances in data gathering tools from ground sensors to aerial-based remote sensing increase the researchers' opportunities and responsibility for the professional management of data to support the reproducibility and validity of science. In this course, biology, engineering, and information science students will learn to design and implement research methodologies for field research that effectively combine 1) the discovery and use of existing data with 2) the collection, organization, analysis, dissemination, and preservation of field generated research data. These research methodologies will be implemented/studied within the motivating context of behavioral wildlife observation research. Working in teams, students will build, program and deploy microcontroller-based field sensors to gather animal behavioral information in challenging field conditions. Students will use tools such as R and Jupyter Notebooks to add metadata, document data for publication and deposit the data in a trusted data repository.		Typically offered, Main campus, Summer (now offered in Spring)	School of Information	Bryan Heidorn

XIII. Emphasis course/faculty information for NEW courses. Complete the table below. Provide email(s)/letter(s) of support from home department head(s) for courses not owned by your department. Add rows as needed. Add rows as needed. Delete example (EX) rows before submitting.

Course prefix and number	Title	Course Description	Pre-requisites	Status*	Anticipated first term offered	Typically Offered (F, Sp, Su, W) and Frequency (every year, odd years, etc.)	Home Dept.	Faculty members available to teach the courses

*In development (D); submitted for approval (S); approved (A)

All courses currently offered/approved

Emails of support for GEOG/RNR 417 and LING/ISTA/CSC 439:

From: Van Leeuwen, Willem J - (leeuw) <leeuw@arizona.edu>
Sent: Thursday, October 22, 2020 2:26 PM
To: Diana Liverman <dianaliverman@icloud.com>; Owen, Laura Catherine Joan - (lauraowen) <lauraowen@arizona.edu>; Rushbrook, Dereka A - (dereka) <dereka@arizona.edu>
Subject: RE: [EXT]Fwd: GEOG 417 in ISTA degree?

Hi Laura:

Thanks for the positive feedback on the 417 course. SNRE is the home department for this RNR/GEOG417 course. Most of SNRE's and SGDE's GIS and Remote sensing courses are x-listed.
Please continue to use this RNR/GEOG 417 course in your new sub-plans.
Best regards, Wim

Willem J.D. van Leeuwen, Professor and Interim Director
School of Natural Resources and the Environment
Professor School of Geography, Development & Environment
Director Arizona Remote Sensing Center
Chair Remote Sensing and Spatial Analysis Graduate Interdisciplinary Program

From: Warner, Natasha - (nwarner) <nwarner@arizona.edu>
Sent: Tuesday, October 20, 2020 12:06 PM
To: Owen, Laura Catherine Joan - (lauraowen) <lauraowen@arizona.edu>; Ohala, Diane K - (ohalad) <ohalad@arizona.edu>; Kelly, Lauren Duley - (laurenduleykelly) <laurenduleykelly@arizona.edu>
Subject: Re: Linguistics classes and ISTA sub-plans

Hi,

yes, I confirm that Linguistics is still happy to have iSchool students in all of those classes, and to have those classes appear in your sub-plans as you mention.

Thanks,
Natasha

****

Natasha Warner, Professor and Head
Dept. of Linguistics, Box 210025
University of Arizona
Tucson, AZ 85721-0025
USA
520-626-5591
Pronouns: she/her/hers

XIV. Using the table below, list each faculty member who will contribute to the teaching of courses in this emphasis and the teaching FTE they will contribute. Add rows as needed.

Course(s)	Name	Department	Rank	Degree	Faculty/% effort
ISTA 311	Dylan Murphy	0418-School of Information	Lecturer	PhD	.2
ISTA 320	Adriana Picoral	0418-School of Information	Assistant Professor, Career Track	PhD	.2
ISTA 321	Nick DiRienzo	0418-School of Information	Assistant Professor, Career Track	PhD	.4
ISTA 322	Nick DiRienzo	0418-School of Information	Assistant Professor, Career Track	PhD	.2
ISTA 331	Dylan Murphy	0418-School of Information	Lecturer	PhD	.2
ISTA 350	Rich Thompson	0418-School of Information	Lecturer	PhD	.4
ISTA 355	Peter Jansen	0418-School of Information	Peter Jansen, Assistant Professor	PhD	.1
ISTA 410	Dylan Murphy	0418-School of Information	Lecturer	PhD	.2
ISTA 421	Clayton Morrison	0418-School of Information	Associate Professor	PhD	Typically .1 (on research leave from teaching)
ISTA 429	Eric Lyons	School of Plan Sciences, Biosystems Engineering, College of Agriculture and Life Sciences and BIO5 Institute, School of Information affiliate	Associate Professor	PhD	Last academic year, .1
ISTA 450	Clayton Morrison	0418-School of Information	Associate Professor	PhD	Typically .1 (on research leave from teaching)
ISTA 456	Steven Bethard, Peter Jansen	0418-School of Information	Associate Professor, Assistant Professor	PhD	Not currently offered
ISTA 439	Gus Hahn-Powell	Linguistics	Assistant Professor	PhD	.1
ISTA 457	Steven Bethard	0418-School of Information	Associate Professor, Assistant Professor	PhD	.1
LIS 470	Bruce Fulton	0418-School of Information	Associate Professor, Career Track	PhD	.1
LIS 470	Ryan Rucker	0418-School of Information	Adjunct Professor	MLIS and M.Ed	.1
ISTA 497	Bryan Heidorn	0418-School of Information	Professor	PhD	.1

XV. **Special conditions for admission to/declaration of this emphasis** – explain in detail the criteria to declare this emphasis, including GPA requirements, completion of courses prior to declaration, application process, interviews, etc. These conditions must be approved by faculty governance to be enforced.

None, other than being in good standing academically (minimum 2.0 GPA).

XVI. **Emphasis productivity –** provide a detailed plan in the case the emphasis does not attract the number of anticipated students and/or the new courses have low enrollments. Will emphasis courses continue to be offered as described in Section XIII and XIV or will students be offered alternative courses from outside the emphasis as substitutions? Is the department/school/college committed to offering the courses regardless of the emphasis productivity?

The iSchool and ISTA programs have experienced growth in recent years; we are offering the emphasis not just to increase enrollment, but to make sure students in the degree graduate with a focused set of skills. As you can see, students have quite a few options, so even if a few courses are not available, they should still be able to graduate with the emphasis quite easily. We are committed to allowing substitutions if a student finds themselves in a bind.

Below is a head count for the current degree for Spring 2016, 2017, 2018, 2019, and 2020:

Headcount				
Bachelor of Science				
Spring 2016	Spring 2017	Spring 2018	Spring 2019	Spring 2020
Active in Plan	Active in Plan	Active in Plan	Active in Plan	Active in Plan
		1		
122	160	209	207	228
122	**160**	**210**	**207**	**228**

ience & Tech 2

We propose the sub plans not to just attract new majors, but also to provide a focus in learning outcomes for our increasing number of majors. As the major expands and our program is able to offer more coursework, it makes sense that what was conceived of as a very broad, interdisciplinary major develops distinct focuses.

We do not anticipate trouble filling emphasis classes. For example, ISTA 322: Data Engineering was offered for the first time this Fall and enrolled 37 out of 40 possible students with no special promotion.

Again, proposed sub plan is also flexible (a choice of 5 out of 19 classes) meaning that even if a few classes are not available or not popular, students are still able to complete it.

XVII. **Do you want the emphasis name to appear on the transcript? ☒ Yes ☐ No**

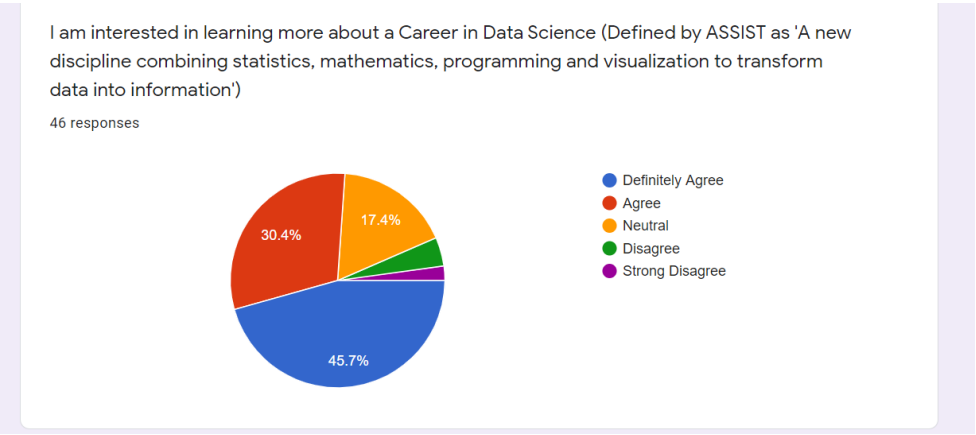
XVIII. Do you want the emphasis name to appear on the diploma? ☒ Yes ☐ No

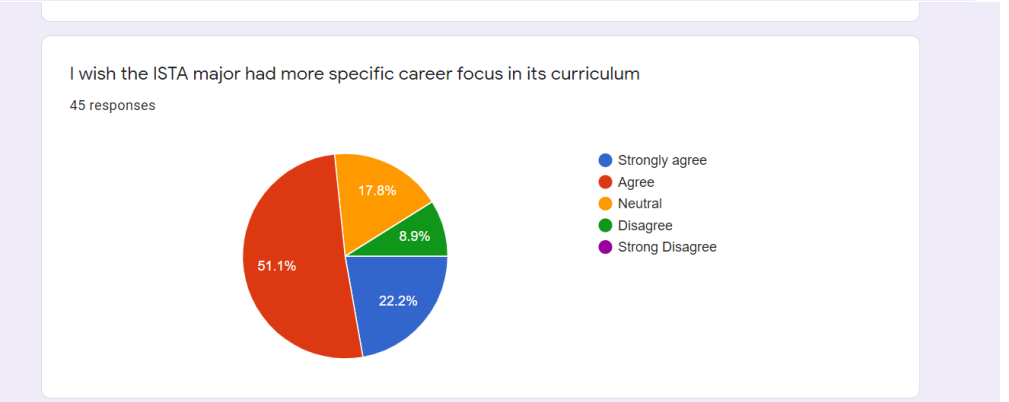
XIX. Anticipated semester and year to launch the proposed emphasis: Fall 2021

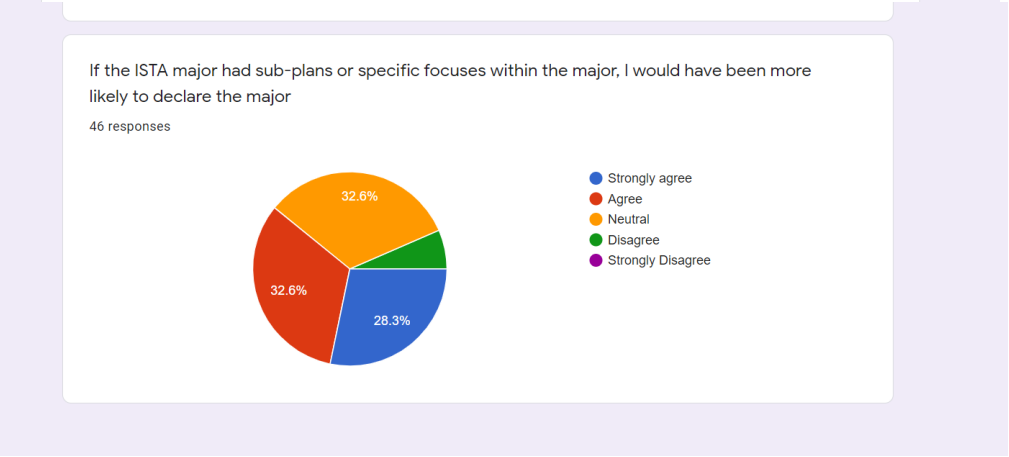
XX. Number of new faculty hires required to deliver the emphasis: None

XXI. Budgetary impact– indicate new resources needed and source of funding to implement the proposed emphasis. If reallocating resources, indicate where resources will be taken from and the impact this will have on the students/faculty/program/unit. None noted

Survey responses in graph form below and linked here:
https://docs.google.com/spreadsheets/d/1IjPpqwchMjuKRutKADy0qvFRtPfhDPThRuEcV6Ykzbk/edit#gid=724816773







Decision process for approval will include:
1) efficiency of course offerings.
2) course offerings are appropriate and match the expertise of the faculty.

3) evidence of sufficient student demand.
3) no major conflict with existing programs.

XXII. Required signatures

Managing Unit Administrator (print name and title): Catherine F. Brooks

Managing Administrator's Signature: Catherine F Brooks Digitally signed by Catherine F Brooks Date: 2021.01.21 09:49:19 -07'00' Date:_____

Managing Unit Administrator (print name and title): _____

Managing Administrator's Signature: _____ Date:_____

Dean (print name and title): Amy C. Kimme Hea

Dean's Signature: Amy C. Kimme Hea Digitally signed by Amy C. Kimme Hea Date: 2021.01.22 12:53:43 -07'00' Date:_____

Dean (printed name and title): _____

Dean's Signature: _____ Date:_____

All programs that will be offered through distance learning and/or fully online must include the following signature. The signature of approval does not indicate a commitment to invest in this program. Any potential investment agreement is a separate process.

Joel Hauff, Associate Vice President Academic Initiatives and Student Success and Executive Director for Online and Distance Education Administration

Signature: _____ Date: _____

Note: In some situations, signatures of more than one unit head and/or college dean may be required.

For use by Curricular Affairs:

Committee	Approval date
Academic Programs Subcommittee	
Undergraduate Council	
College Academic Administrators Council	

☐ Create approval memo
☐ Send memo to college/dept and acad_org listserv
☐ Create emphasis code in UAccess, including secondary major emphasis code
☐ Upload approval memo and proposal documents to UAccess
☐ Notify acad_org of the plan code creation
☐ Notify ADVIP team, include proposers