

The completed and signed proposal should be submitted by the Dean's Office to: curriculumplanning@asu.edu. Before academic units can advertise undergraduate certificates or include them in their offerings as described in the university catalogs, they must be recommended for approval by the Senate Curriculum and Academic Programs Committee and the University Senate, and be approved by the Executive Vice President and Provost of the University.

Definition and minimum requirements:

These are the minimum requirements for approval. Individual undergraduate certificates may have additional requirements.

An undergraduate certificate is a programmatic or linked series of courses from a single field or one that crosses disciplinary boundaries and may be free-standing or affiliated with a degree program. The certificate provides a structured and focused set of courses that can be used to enhance a student's baccalaureate experience or professional development.

An undergraduate certificate program:

- Requires a minimum of 15 semester hours of which at least 12 semester hours must be upper division
- Requires a minimum grade of "C" or better for all upper division courses
- Consists of courses that must directly relate in whole or large part to the purpose of the certificate. Example: Geographic area certificates must include only courses specific to the title of the certificate, other than a non-English language
- Is cross disciplinary; or,
 - Certified by a professional or accredited organization/governmental agency; or,
 - Clearly leads to advanced specialization in a field; or,
 - Is granted to a program that does not currently have a major

College/School/Institute: New College of Interdisciplinary Arts and Sciences

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

Proposed Certificate Name: Data Science

Requested effective Date: Spring 2019

Delivery method: On-campus only (ground courses and/or iCourses)

Note: Once students elect a campus or On-line option, students will not be able to move back and forth between the on-campus and the ASU Online options. Approval from the Office of the Provost and Philip Regier (Executive Vice Provost and Dean) is required to offer programs through ASU Online.

Campus/Locations:

Indicate all locations where this program will be offered.

Downtown Phoenix
 Polytechni
 Tempe
 West
 Other: _____
 c

Proposal Contact

Name: Suzanne W. Dietrich

Title: Professor, Applied Computing Program Lead

Phone number: (602)543-5628

Email: dietrich@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: Todd Sandrin, Vice Provost & Dean, New College of Interdisciplinary Arts & Sciences

Signature  **Date:** 12/15/2017

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. Overview

A. Provide a brief description of the new certificate.

The data science certificate program offered by the School of Mathematical and Natural Sciences combines the strengths of database skills with interdisciplinary computational statistics. The strategic combination of computing and statistics will develop students' expertise in the design and analysis of data. The data science certificate is intended to serve students interested in a variety of career fields, including statistics, business, and network administration, or for those who intend to pursue graduate and professional schools.

B. This proposed certificate (check one):

- Is cross disciplinary; or
- Is certified by a professional or accredited organization/governmental agency; or,
- Clearly leads to advanced specialization in a field; or,
- Is granted to a program that does not currently have a major.

C. Why should this be a certificate rather than a concentration or a minor?

This certificate indicates a collection of courses as an advanced specialization in data science for applied computing majors that includes upper-level database courses and an interdisciplinary course on computational statistics. A certificate has been proposed to allow for students in related majors to take advantage of this specialization, which is inherently cross-disciplinary. Data science is a strategic combination of computing and statistics that supports the design and analysis of data. Therefore, students in associated disciplines, such as statistics, applied mathematics, and computer science, can enhance their baccalaureate experience by gaining the expertise in computational and statistical methods to extract insights from complex datasets.

D. Affiliation

If the certificate program is affiliated with a degree program, include a brief statement of how it will complement the program. If it is not affiliated with a degree program, incorporate a statement as to how it will provide an opportunity for a student to gain knowledge or skills not already available at ASU.

The certificate will be affiliated with the applied computing degree. It will complement the program by incorporating a new course on data science as well as including an existing course on computational statistics.

E. Demand

Explain the need for the new certificate (e.g., market demand, interdisciplinary considerations).

There is a high demand in the workforce for those having computational skills with the ability to design and analyze data. The undergraduate certificate will provide an educational foundation in the necessary skills of a data scientist, which is a qualified data professional that can both design data-centric systems and analyze the data using computational and statistical methods. These skills are inherently interdisciplinary in nature, integrating computer science data and computational knowledge with the ability to provide a statistical analysis of the data for interpretation. Students possessing this diverse skill set for problem solving will be in high demand in the workforce, which recognizes the need for an interdisciplinary approach to dealing with data-centric design and analysis.

F. Projected enrollment

What are enrollment projections for the first three years?

	1st Year	2nd Year (Yr. 1 continuing + new entering)	3rd Year (Yr. 1 & 2 continuing + new entering)
Number of Students (Headcount)	7	15	25

2. Support and Impact

A. Faculty governance

Provide a supporting letter from the chair of the academic unit verifying that the proposed certificate has received faculty approval through appropriate governance procedures in the unit and that the unit has the resources to support the certificate as presented in the proposal, without impacting core program resources.

Attached

B. Other related programs

Identify other related ASU programs and outline how the new certificate will complement these existing ASU programs. (If applicable, statements of support from potentially-affected academic unit administrators need to be included with this proposal submission.)

This unique certificate is closely affiliated with the Applied Computing programs at the West campus. There are no other programs at the West campus that are related to this certificate. Attached to this proposal is a statement of support from Fulton Schools of Engineering, School of Computing, Informatics, and Decision Systems and W. P. Carey School of Business. An impact statement related to future program development in the College of Liberal Arts and Sciences has been included as well.

C. Letter(s) of support

Provide a supporting letter from each college/school dean from which individual courses are taken.

3. Academic Curriculum and Requirements

A. Knowledge, competencies, and skills

List the knowledge, competencies, and skills (learning outcomes) students should have when they complete this proposed certificate. Examples of program learning outcomes can be found at (<http://www.asu.edu/oue/assessment.html>).

Upon completion of this certificate, the students will

- understand the different stages of the data science process
- be able to acquire and pre-process real-world datasets
- understand the key technologies of data cleaning and transformation
- use data visualization tools for exploratory data analysis
- be able to design and implement predictive models using supervised and unsupervised machine learning techniques

B. Assessment

Describe the plan and methods to assess whether students have achieved the knowledge, competencies and skills identified in the Learning Outcomes. (You can find examples of assessment methods at (<https://uoeee.asu.edu/assessment>))

70% of students in ACO 320 Database Systems will successfully complete the project component of the course using faculty-constructed project rubrics to evaluate the projects.

70% of students in ACO 321 Database Development and Applications will successfully complete the project component of the course using faculty-constructed project rubrics to evaluate the projects.

70% of students in ACO 420 Big Data Systems (Large Scale Database Systems) will successfully complete the project component of the course using faculty-constructed project rubrics to evaluate the projects.

70% of students in ACO 421 Data Mining and Warehousing will successfully compete the project component of the course using faculty-constructed project rubrics to evaluate the projects.

70% of students in ACO 423 Data Science will successfully complete the project component of the course using faculty-constructed project rubrics to evaluate the projects.

70% of students in STP 315 Statistical Computing will successfully complete the project component of the course using faculty-constructed project rubrics to evaluate the projects.

C. Admissions criteria

List the admissions criteria for the proposed certificate. If they are identical to the admission criteria for the existing major and degree program under which this certificate will be established, please note that here.

Admission criteria for the proposed certificate are identical to BS Applied Computing program admission criteria.

D. Curricular structure

Provide the curricular structure for this certificate. Be specific in listing required courses and specify the total minimum number of hours required for the certificate.

Required certificate courses				
Prefix	Number	Title	Is this a new Course?	Credit Hours
ACO	320	Database Systems	No	3
ACO	423	Data Science	Yes	3
STP	315	Statistical Computing	No	3
			(Select one)	
<i>Section sub-total:</i>				9
Elective certificate courses				
Prefix	Number	Title	Is this a new Course?	Credit Hours
ACO	321	Database Development and Applications	No	3
ACO	420	Big Data Systems	No	3
ACO	421	Data Mining and Warehousing	No	3
BMI	311	Modeling Biomedical Knowledge	No	3
BMI	312	Modeling Biomedical Data	No	3
<i>Section sub-total:</i>				6

Other certificate requirements	Credit Hours
E.g. – Capstone experience, internship, clinical requirements, field studies, foreign language skills as applicable	
<i>Section sub-total:</i>	0
Total minimum credit hours required for certificate	15

E. Minimum residency requirement

How many hours of the certificate must be ASU credit?

F. New Courses

Provide a brief course description for each new course.

ACO 423 Data Science (New College): This course focuses on the study of computational and machine learning methods to extract insights from data. The course encompasses the study of the different components in the data science process: data collection, data cleaning and transformation, exploratory data analysis, data visualization, and machine learning algorithms. The content related to machine learning includes the design and development of predictive models using supervised and unsupervised approaches.

DAT 300 Mathematical Tools for Data Science (CLAS): 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 and R.

DAT 301 Exploring Data in R and Python (CLAS): 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.

Note: All new required courses should be submitted in Curriculum Changelog and ready for Provost’s Office approval before this certificate is put on Curriculum and Academic Programs Committee (CAPC) agenda.

4. Administration and Resources

A. Administration

How will the proposed certificate be administered (including admissions, student advisement, retention, etc.)? Admission and student advisement will be handled with routine advising.

B. Resources

What are the resource implications for the proposed certificate, including any projected budget needs? Will new books, library holdings, equipment, laboratory space and/or personnel be required now or in the future? If multiple units/programs will collaborate in offering this certificate please discuss the resource contribution of each participating program. Letters of support must be included from all academic units that will commit resources to this certificate.

No new resources needed

C. Primary Faculty

List the primary faculty participants regarding this proposed certificate. For interdisciplinary certificates, please include the relevant names of faculty members from across the University.

Name	Title	Area(s) of Specialization as they relate to proposed certificate
Suzanne W. Dietrich	Professor	Databases
Yasin Silva	Associate Professor	Databases
Jennifer Broatch	Assistant Professor	Statistics

5. Additional Materials

- A. Complete and attach the Appendix document.
- B. Provide one or more model programs of study (if appropriate).
- C. Attach other information that will be useful to the review committees and the Office of the Provost.

APPENDIX

OPERATIONAL INFORMATION FOR UNDERGRADUATE CERTIFICATES

(This information is used to populate the Degree Search/catalog website.
Please consider the student audience in creating your text.)

- A. **Proposed Certificate Name:** Data Science
- B. **Marketing Text:**
Optional. 50 words maximum. The marketing description should not repeat content found in the program description. The data science certificate is intended for students interested in a variety of career fields, including statistics, business and network administration, or for those who intend to pursue graduate and professional schools. The strategic combination of computing and statistics will develop students' expertise in the design and analysis of data.
- C. **Description (150 words maximum)**
The data science certificate combines the strengths of database skills with interdisciplinary computational statistics. The certificate program provides students with an understanding of, as well as hands-on experience in, computational and statistical methods to extract insights from complex datasets. In particular, the program includes courses that cover key techniques for the different stages of the data science process: data collection, data processing for small and big data, data cleaning, exploratory data analysis, data visualization, predictive modeling with machine learning techniques, and statistical modeling.
- D. **Contact and Support Information**
- | | |
|---|---|
| Building Name, code and room number: (Search ASU map) | FAB N100 |
| Program office telephone number: (<i>i.e.</i> 480/965-2100) | 602/543-3000 |
| Program Email Address: | MNSadvising@asu.edu |
| Program Website Address: | http://newcollege.asu.edu/data-science-certificate |
- E. **Program Requirements:** Provide applicable information regarding the program such as curricular restrictions or requirements, specific course lists, or academic retention requirements.

Core Requirements: 15 credit hours (must be passed with a “C” (2.00) or better)

Required certificate courses (9 credit hours)

ACO 320 Database Systems (3)
ACO 423 Data Science (3)
STP 315 Statistical Computing (3)

Elective certificate courses (6 credit hours; choose two)

ACO 321 Database Development and Applications (3)
ACO 420 Big Data Systems (3)
ACO 421 Data Mining and Warehousing (3)
BMI 311 Modeling Biomedical Knowledge (3)
BMI 312 Modeling Biomedical Data (3)
DAT 300 Mathematical Tools for Data Science (3)
DAT 301 Exploring Data in R and Python (4)

Depending on a student's undergraduate program of study, prerequisite courses may be needed in order to complete the requirements of this certificate.

- F. **Additional Admission Requirements** If applicable list any admission requirements (freshman and/or transfer) that are higher than and/or in addition to the university minimum undergraduate admission requirements.)

Prerequisites for this certificate are:

ACO 201 Data Structures and Algorithms (3)
MAT 243 Discrete Mathematical Structures or MAT 300 Mathematical Structures (3)
STP 226 Elements of Statistics (3)

A student pursuing an undergraduate certificate must be enrolled as a degree-seeking student at ASU. Undergraduate certificates are not awarded prior to the award of an undergraduate degree. A student already holding an undergraduate degree may pursue an undergraduate certificate as a nondegree-seeking graduate student.

G. Delivery/Campus Information Delivery: On-campus only (ground courses and/or iCourses)

Note: Once students elect a campus or On-line option, students will not be able to move back and forth between the on-campus and the ASU Online options. Approval from the Office of the Provost and Philip Regier (Executive Vice Provost and Dean) is required to offer programs through ASU Online.

H. Campus/Locations:

Indicate all locations where this program will be offered.

Downtown Phoenix Polytechnic Tempe West Other:

JRTOZZU

The certificate in data science consists of a minimum of 15 upper division credit hours. All courses used to satisfy requirements for the certificate must be passed with a "C" (2.00) or better.

Required Courses -- 9 credit hours

ACO 320: Database Systems (3)

ACO 423: Data Science (3)

STP 315: Statistical Computing (3)

Electives -- 6 credit hours

ACO 321: Database Development & Applications (3)

ACO 420: Big Data Systems (3)

ACO 421: Data Mining and Warehousing (3)

BMI 311: Modeling Biomedical Knowledge (3)

BMI 312: Modeling Biomedical Data (3)

Depending on a student's undergraduate program of study, prerequisite courses may be needed in order to complete the requirements of this certificate.

April 24, 2017

To: Marlene Tromp, Dean
New College of Interdisciplinary Arts and Sciences

From: Lara Ferry, Director and Professor
School of Mathematical and Natural Sciences

Re: Data Science Certificate Proposal

Attached please find the Proposal to Establish a New Certificate in Data Science. This proposal was prepared by a faculty committee chaired by Suzanne W. Dietrich. It was approved by the MNS Curriculum Committee and the entire MNS faculty.

Please approve this proposal and forward it for further approvals.

From: [Todd Sandrin](#)
To: [Stacey Kimbell](#)
Cc: [Tosha Ruggles](#)
Subject: FW: Request for Impact Statements - Applied Computing Minor and Data Science Certificate
Date: Wednesday, May 10, 2017 1:21:26 PM
Attachments: [Proposal to Establish a Minor ACO.docx](#)
[Proposal to Establish an Undergrad Certificate DataScience.docx](#)
[image001.png](#)

FYI

From: James Collofello
Sent: Wednesday, May 10, 2017 12:28 PM
To: Todd Sandrin <Todd.Sandrin@asu.edu>
Subject: FW: Request for Impact Statements - Applied Computing Minor and Data Science Certificate

Todd,

We have reviewed both proposals and the Fulton Schools of Engineering does not have any concerns.

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: Todd Sandrin
Sent: Tuesday, May 9, 2017 8:57 AM
To: Kyle Squires <squires@asu.edu>
Subject: Request for Impact Statements - Applied Computing Minor and Data Science Certificate

Dear Kyle,

I hope this email finds you enjoying a pleasant end to the spring semester.

Our School of Mathematical and Natural Sciences is proposing a minor in Applied Computing and an undergraduate certificate in Data Science.

I have attached the program proposals for your review.

Might you provide a statement of impact for each program?

Thanks!

Todd

Todd R. Sandrin, Ph.D.

[Professor, School of Mathematical and Natural Sciences](#)

Senior Sustainability Scientist - [Julie Ann Wrigley Global Institute of Sustainability](#)

Senior Associate Dean, [ASU New College](#) | [Director, NCUIRE](#)



Arizona State University

4701 W. Thunderbird Rd. | Glendale, AZ 85306

602.543.6934 | Todd.Sandrin@asu.edu

From: [Patricia Friedrich](#)
To: [Stacey Kimbell](#)
Subject: FW: Collaboration on Data Science courses?
Date: Tuesday, April 17, 2018 8:45:49 AM

Dear Stacey,

Upon conversations with MNS faculty, we decided to include 311 and 312 as electives. Could you please add those and this conversation to our records?

Thank you, Patty

Patricia Friedrich, PhD
Associate Dean for Academic Programs,
New College of Interdisciplinary Arts and Sciences
Professor of Linguistics/Rhetoric and Composition,
School of Humanities, Arts, and Cultural Studies
Arizona State University P. O. Box 37100
4701 W. Thunderbird Rd. Mail Code 3051
Phoenix, AZ, USA 85069-7100
voice 602 543-6046

From: George Runger <George.Runger@asu.edu>
Date: Monday, April 16, 2018 at 4:10 PM
To: Lara Ferry <Lara.Ferry@asu.edu>
Cc: Maria Hanlin <Maria.Hanlin@asu.edu>, Anita Murcko <Anita.Murcko@asu.edu>, Patricia Friedrich <Patricia.Friedrich@asu.edu>
Subject: RE: Collaboration on Data Science courses?

Lara

We have a few options, a two course sequence BMI 311 & 312, and also BMI 221. Descriptions follow, we look forward to being included, thank you.

Knowledge Representation for Biomedical Informatics

Course Description:

Introduces topics in knowledge representation and modeling, including frame-based systems, logic-based systems, rule-based systems, inference, and reasoning. Overview of history and present state of the field.

BMI 221

Offering School/Colleges Pre-requisite(s):

[College of Health Solutions -- Biomedical Informatics Program](#)

Allow multiple enrollments: No

Repeatable for credit: No

Primary course component: Lecture

Grading method: Student Option

Modeling Biomedical Knowledge

Course Description:

Introduces concepts of artificial intelligence and knowledge modeling using medical informatics examples. Historical foundations and motivations of AI in medical applications; problem solving, reasoning, knowledge management, and planning as applied to medical informatics problems.

BMI 311 Offering School/Colleges Pre-requisite(s):

[College of Health Solutions -- Biomedical Informatics Program](#)

3

Allow multiple enrollments: No

Repeatable for credit: No

Primary course component: Lecture

Grading method: Student Option

Modeling Biomedical Data

Course Description:

Third semester of a three-semester course surveying the methods and theories underlying the field of biomedical informatics. Explores methods of use in the design and maintenance of biomedical databases, machine learning techniques, information retrieval in biomedicine and other methods specific to bioinformatics.

BMI 312 Offering School/Colleges Pre-requisite(s):

[College of Health Solutions -- Biomedical Informatics Program](#)

Allow multiple enrollments: No

Repeatable for credit: No

Primary course component: Lecture

Grading method: Student Option

From: Lara Ferry

Sent: Monday, April 16, 2018 12:47 PM

To: George Runger <George.Runger@asu.edu>

Cc: Patricia Friedrich <Patricia.Friedrich@asu.edu>

Subject: Re: Collaboration on Data Science courses?

Here you go

This does not yet include the two 'DAT' courses we are also sharing with CLAS. I believe DAT is the new prefix that they are using for their program.

From: George Runger <George.Runger@asu.edu>

Date: Monday, April 16, 2018 at 12:00 PM
To: Lara Ferry <Lara.Ferry@asu.edu>
Subject: RE: Collaboration on Data Science courses?

Lara

Can you please send the latest version of the proposal, thank you, George

From: Lara Ferry
Sent: Monday, April 16, 2018 11:55 AM
To: George Runger <George.Runger@asu.edu>
Cc: Patricia Friedrich <Patricia.Friedrich@asu.edu>
Subject: Re: Collaboration on Data Science courses?

Thanks George!

Sent from my iPhone, please excuse the brevity and typos.

On Apr 16, 2018, at 11:47 AM, George Runger <George.Runger@asu.edu> wrote:

Lara

Let me compile any inputs and reply to you later today.

From: Lara Ferry
Sent: Monday, April 16, 2018 11:43 AM
To: George Runger <George.Runger@asu.edu>
Cc: Patricia Friedrich <Patricia.Friedrich@asu.edu>
Subject: Fwd: Collaboration on Data Science courses?

Hello George,

Just wanted to ping you again to see if you had ideas for courses on which we could collaborate.

We need to return our proposal edits to the Provost today.

Thank you so much!

Lara Ferry

Sent from my iPhone, please excuse the brevity and typos.

Begin forwarded message:

From: Lara Ferry <lferry@asu.edu>
Date: April 9, 2018 at 1:41:46 PM MST
To: George Runger <George.Runger@asu.edu>
Cc: Patricia Friedrich <Patricia.Friedrich@asu.edu>
Subject: Collaboration on Data Science courses?

Hello George,

As per our previous conversations, we are ready to request permission to implement our certificate in Data Science. We anticipate receiving news of your own submission of a proposal to plan a Data Science major and minor combination. While we envision this certificate as an add-on for our own students' benefit, and not in competition with your program, we would like to be able to collaborate with you by including some of your existing courses in the program. If you could please let us know if there are any courses in your current list of offerings that would be particularly pertinent in this case, that would be most welcomed. We would very much like to be able to have this proposal considered by the Senate before the end of the term, so if you could please send us information by April 16, that would be very helpful. We don't have to have every detail worked out by then, but even just ideas would be most helpful.

Lara Ferry, PhD
Director and Professor, School of Mathematical & Natural Sciences
Honors Faculty, Barrett The Honors College
Sr. Sustainability Scholar, Julie Ann Wrigley Global Institute of Sustainability

Arizona State University
Mailing Address (letters): PO Box 37100, MC 2352 • Phoenix, AZ 85069-7100
Shipping Address (packages): 4701 W. Thunderbird Rd • Glendale, AZ 85306-4908
Office: CLCC 290 • (602) 543-2817
Research Website: <http://morphology.asu.edu>

From: [Patricia Friedrich](#)
To: [Kay Faris](#); [Michele Pfund](#)
Cc: [Stacey Kimbell](#)
Subject: Re: Proposal to establish certificate in Data Science
Date: Thursday, July 27, 2017 3:08:25 PM
Attachments: [image001.png](#)

Dear Kay,

Thank you so much for reaching out and for your support. The program is planned to be delivered face to face, so no conflict there.

Thanks again,

Patty

Patricia Friedrich, PhD
Associate Dean for Academic Programs,
New College of Interdisciplinary Arts and Sciences
Professor of Linguistics/Rhetoric and Composition,
School of Humanities, Arts, and Cultural Studies
Arizona State University P. O. Box 37100
4701 W. Thunderbird Rd. Mail Code 3051
Phoenix, AZ, USA 85069-7100
voice 602 543-6046

From: Kay Faris <KAY.FARIS@asu.edu>
Date: Thursday, July 27, 2017 at 2:51 PM
To: Patricia Friedrich <Patricia.Friedrich@asu.edu>, Michele Pfund <Michele.Pfund@asu.edu>
Subject: RE: Proposal to establish certificate in Data Science

Hi Patricia,

Thank you for reaching out to us. I see that this certificate is planned for West Campus. Do you ever have plans to run this online? We would be supportive if the program is at West, but we would have more concerns if it were going to run online as we have some overlap with the program.

Thanks,

Kay

Kay A. Faris
Senior Associate Dean, Academic Programs
W. P. Carey School of Business
Arizona State University

Tempe, AZ 85287-3406
Phone: 480-965-7587
Fax: 480-965-3846
Kay.Faris@asu.edu



From: Patricia Friedrich
Sent: Wednesday, July 26, 2017 10:41 AM
To: Kay Faris <KAY.FARIS@asu.edu>; Michele Pfund <Michele.Pfund@asu.edu>
Subject: FW: Proposal to establish certificate in Data Science

Dear Kay, dear Michele:

I wonder if you had a chance to consider the certificate proposal attached and whether you could provide us with an impact statement. Thanks so much!

Patty

Patricia Friedrich, PhD
Associate Dean for Academic Programs,
New College of Interdisciplinary Arts and Sciences
Professor of Linguistics/Rhetoric and Composition,
School of Humanities, Arts, and Cultural Studies
Arizona State University P. O. Box 37100
4701 W. Thunderbird Rd. Mail Code 3051
Phoenix, AZ, USA 85069-7100
voice 602 543-6046

From: Patricia Friedrich <Patricia.Friedrich@asu.edu>
Date: Tuesday, July 11, 2017 at 3:44 PM
To: Kay Faris <KAY.FARIS@asu.edu>, Michele Pfund <Michele.Pfund@asu.edu>
Subject: FW: Proposal to establish certificate in Data Science

Dear Kay, dear Michelle:

Forgive me while I learn what request goes to whom. Please find attached the revised request for the establishment of a certificate in Data Science. I would appreciate if you could provide us with an impact statement.

Thank you so much, Patty

Patricia Friedrich, PhD
Associate Dean for Academic Programs,
New College of Interdisciplinary Arts and Sciences
Professor of Linguistics/Rhetoric and Composition,
School of Humanities, Arts, and Cultural Studies
Arizona State University P. O. Box 37100
4701 W. Thunderbird Rd. Mail Code 3051
Phoenix, AZ, USA 85069-7100
voice 602 543-6046

From: [Patricia Friedrich](#)
To: [Stacey Kimbell](#)
Subject: FW: Collaboration on Data Science courses?
Date: Monday, April 16, 2018 11:55:23 AM

FYI

Patricia Friedrich, PhD
Associate Dean for Academic Programs,
New College of Interdisciplinary Arts and Sciences
Professor of Linguistics/Rhetoric and Composition,
School of Humanities, Arts, and Cultural Studies
Arizona State University P. O. Box 37100
4701 W. Thunderbird Rd. Mail Code 3051
Phoenix, AZ, USA 85069-7100
voice 602 543-6046

From: Lara Ferry <Lara.Ferry@asu.edu>
Date: Monday, April 16, 2018 at 11:53 AM
To: Patricia Friedrich <Patricia.Friedrich@asu.edu>
Subject: Fwd: Collaboration on Data Science courses?

Sent from my iPhone, please excuse the brevity and typos.

Begin forwarded message:

From: Donald Jones <dajones@asu.edu>
Date: April 16, 2018 at 11:49:50 AM MST
To: Lara Ferry <Lara.Ferry@asu.edu>
Subject: Re: Collaboration on Data Science courses?

Lara,

No issue at all. I hope the DAT courses are running 2019-2020 academic year

I think there should be a collaboration on the data science degree/courses. I hope this happens.

Don

On 16 April 2018 at 11:30, Lara Ferry <Lara.Ferry@asu.edu> wrote:

|

Hi Don,

Just wanted to ping you once more. Do you object to our adding two of your DAT courses (300 and 301) as extra electives to our map? We need to return our revisions to the Provost today, and he's keen to see collaboration between our two units. We understand the courses won't be ready immediately, but for the future this offers options to our students who might need electors at times when we are not offering them.

Please also let me know how we can collaborate on future courses, and if any of our existing might be of interest to you.

Thank you!

Lara Ferry

Sent from my iPhone, please excuse the brevity and typos.

On Apr 10, 2018, at 8:48 AM, Donald Jones <dajones@asu.edu> wrote:

Hi Lara,

I've attached a rough description of the courses we proposed for the data science degree. Right now the degree is stuck at the college level because they do not know of a way to code the concentration portion of the degree.

The only class currently running as a special topics is the machine learning class.

None of the proposed classes would be running before fall 2019 - so, this will not help with your certificate. Of course, some of the current STP classes may be relevant.

Best,
Don Jones
Director of Undergraduate Studies
SoMSS

On 10 April 2018 at 05:39, Albert Boggess <boggess@asu.edu> wrote:

Lara,

I am copying our associate director, Don Jones, who can give you the descriptions of the courses we will be proposing for the data science degree.

Best,

Al

On Mon, Apr 9, 2018 at 9:40 PM, Lara Ferry
<Lara.Ferry@asu.edu> wrote:

Hello Al,

As per our previous conversations, we are ready to request permission to implement our certificate in Data Science. We anticipate receiving news of your own submission of a proposal to plan a Data Science major and minor combination. While we envision this certificate as an add-on for our own students' benefit, and not in competition with your program, we would like to be able to collaborate with you by including some of your existing courses in the program. If you could please let us know if there are any courses in your current list of offerings that would be particularly pertinent in this case, that would be most welcomed. We would very much like to be able to have this proposal considered by the Senate before the end of the term, so if you could please send us information by April 16, that would be very helpful. We don't have to have every detail worked out by then, but even just ideas would be most helpful.

Lara Ferry, PhD
Director and Professor, School of Mathematical & Natural Sciences
Honors Faculty, Barrett The Honors College
Sr. Sustainability Scholar, Julie Ann Wrigley Global Institute of
Sustainability

Arizona State University
Mailing Address (letters): PO Box 37100, MC 2352 • Phoenix, AZ 85069-7100
Shipping Address (packages): [4701 W. Thunderbird Rd • Glendale, AZ 85306-4908](#)
Office: CLCC 290 • (602) 543-2817
Research Website: <http://morphology.asu.edu>

<dsmajormap.pdf>

From: [Patricia Friedrich](#)
To: [Stacey Kimbell](#)
Subject: FW: certificate in Data Science
Date: Wednesday, July 26, 2017 9:11:02 AM

It has actually been two weeks. --P

Patricia Friedrich, PhD
Associate Dean for Academic Programs,
New College of Interdisciplinary Arts and Sciences
Professor of Linguistics/Rhetoric and Composition,
School of Humanities, Arts, and Cultural Studies
Arizona State University P. O. Box 37100
4701 W. Thunderbird Rd. Mail Code 3051
Phoenix, AZ, USA 85069-7100
voice 602 543-6046

From: Patricia Friedrich <Patricia.Friedrich@asu.edu>
Date: Thursday, July 13, 2017 at 3:57 PM
To: Ferran Garcia-Pichel <ferran@asu.edu>
Subject: certificate in Data Science

Dear Ferran (if I may):

Thank you for the information and reply. We did not realize you were developing this degree. It may not have been clear in my previous email, and so I would like to add it here, that our certificate was already approved during last year's Program Plan cycle. We received a letter of support from Fulton prior to submitting the full proposal to Curriculum Planning. We were asked to seek an impact statement from you later in the process, during the proposal's revision steps. This is to say that we are actually quite far along in the process at this point: the certificate is ready, rather than in planning. We will of course note your concern when we send our proposal back in, if that is your preference, but we were hoping the facts stated here would contribute to reconsideration. We did not seek approval for a major nor a minor, so our offering would stand in complementarity rather than competition with yours. I too am available for a chat anytime.

Thanks, Patty

Patricia Friedrich, PhD
Associate Dean for Academic Programs,
New College of Interdisciplinary Arts and Sciences
Professor of Linguistics/Rhetoric and Composition,
School of Humanities, Arts, and Cultural Studies
Arizona State University P. O. Box 37100
4701 W. Thunderbird Rd. Mail Code 3051

Phoenix, AZ, USA 85069-7100
voice 602 543-6046

From: [Patricia Friedrich](#)
To: [Stacey Kimbell](#)
Subject: FW: Proposal to establish certificate in Data Science
Date: Tuesday, July 11, 2017 5:30:33 PM

FYI, please let me know how Todd would like to proceed. I was not involved in the development of this certificate, as it precedes me, so I don't know the details of this conversation but would be happy to help.

Thanks, --P

Patricia Friedrich, PhD
Associate Dean for Academic Programs,
New College of Interdisciplinary Arts and Sciences
Professor of Linguistics/Rhetoric and Composition,
School of Humanities, Arts, and Cultural Studies
Arizona State University P. O. Box 37100
4701 W. Thunderbird Rd. Mail Code 3051
Phoenix, AZ, USA 85069-7100
voice 602 543-6046

From: Ferran Garcia-Pichel <ferran@asu.edu>
Date: Tuesday, July 11, 2017 at 5:11 PM
To: Patricia Friedrich <Patricia.Friedrich@asu.edu>
Cc: Patrick Kenney <pkenney@asu.edu>, Elizabeth Wentz <WENTZ@asu.edu>, Paul LePore <Paul.Lepore@asu.edu>
Subject: Re: Proposal to establish certificate in Data Science

Dear Patricia,

While we are typically very supportive of your college's path to curricular development and diversification, in this case we see a significant conflict with our plans to develop our own. We have been working extensively across units to develop an undergraduate program in Data Science, one of sufficient stature and breadth that can compete well at the national stage. This would include a BS and also a minor on ground, and a plan for an online extension. This is THE single major curricular development effort in the college, and we have secure the support of the Provost and the Fulton Schools of Engineering. It will be an innovation of importance for ASU as a whole.

Having such a parallel effort in New College would probably create confusion for students, and during the presentation and defense of our plans in front of the Board of Regents. Because of this, I am afraid that we cannot support your plans (at this point in time). Also, Libby Wentz tells me that there may be additional conflicts with the existing CLAS undergraduate certificate in social science methods. Sorry to be so curt in my answer, as I am away at a meeting in NM. I am happy to chat

with you more at length about this when I am back on Thursday.

Ferran

From: Patricia Friedrich <Patricia.Friedrich@asu.edu>

Date: Tuesday, July 11, 2017 at 3:48 PM

To: Ferran <ferran@asu.edu>

Subject: FW: Proposal to establish certificate in Data Science

Dear Dean Garcia-Pichel:

I have recently taken over the Associate Dean for Academic Programs position at New College, and I look forward to working with you. I am writing to request an impact statement for our revised version of the Undergraduate Certificate in Date Science. Thank you so much,

Patricia

Patricia Friedrich, PhD
Associate Dean for Academic Programs,
New College of Interdisciplinary Arts and Sciences
Professor of Linguistics/Rhetoric and Composition,
School of Humanities, Arts, and Cultural Studies
Arizona State University P. O. Box 37100
4701 W. Thunderbird Rd. Mail Code 3051
Phoenix, AZ, USA 85069-7100
voice 602 543-6046

FERRAN GARCIA-PICHEL, PH.D.
DEAN OF NATURAL SCIENCES, COLLEGE OF LIBERAL ARTS AND SCIENCES, &
PROFESSOR, SCHOOL OF LIFE SCIENCES
ARIZONA STATE UNIVERSITY
ASSISTANT: MICHELLE.WATSON@ASU.EDU 480 9658065

LAB: garcia-pichel.lab.asu.edu

Stacey Kimbell

From: Patricia Friedrich
Sent: Thursday, November 16, 2017 10:20 AM
To: Stacey Kimbell
Subject: FW: Urgent re: Proposal to establish certificate in Data Science
Attachments: Proposal_to_Establish_an_Undergrad_Certificate_DataScience Revised 11-16-17.docx

Dear Stacey, here's Lara's revised assessment plan as well as her response to CLAS. Since she and I have worked this semester in an attempt to implement, I understand that CLAS has expressed reservations because they themselves intend to develop in the direction of Data Science. We, however, were given permission one year ahead of their showing intention to also plan, and therefore would like to express our continued interest in following up with what we original received approval for. The offering is for West students specifically as an add-on to their programs of study. As always, we are open to collaborations and partnerships if CLAS is willing.

If you could include this message as well as Lara's response below to our Changemaker process, I would be grateful.

Thank you, Patty

Patricia Friedrich, PhD
Associate Dean for Academic Programs,
New College of Interdisciplinary Arts and Sciences
Professor of Linguistics/Rhetoric and Composition,
School of Humanities, Arts, and Cultural Studies

From: Lara Ferry <Lara.Ferry@asu.edu>
Date: Thursday, November 16, 2017 at 10:08 AM
To: Patricia Friedrich <Patricia.Friedrich@asu.edu>
Subject: Re: Urgent re: Proposal to establish certificate in Data Science

Patty,

Here is the summary of the CLAS situation: We do not think that CLAS will provide a letter of support for this proposal. Apparently CLAS has begun developing what they feel is a very similar program, which might serve as the basis for a degree program or programs (our understanding is a graduate and possibly undergraduate degree). We do not envision offering anything more substantive than a certificate on the West campus, and we do not think that this certificate would complete with a stand-alone degree. This would be an 'add-on' for students largely already at the West campus. We have shared with CLAS that we were approved to develop this degree last year, and thus we are a year ahead of them in the process. We have also shared that we do not think our certificate will compete with their plans, and we have no issue with them continuing with their plans. Finally, we have offered to work collaboratively with them, making our program and their program synergistic in some fashion, such that both units benefit.