PROPOSAL TO ESTABLISH A NEW GRADUATE CONCENTRATION

This form should be used for academic units wishing to propose a new concentration for existing graduate degrees.

A concentration is a subspecialty within a degree and major. It indicates the fulfillment of a designated, specialized course of study, which qualifies the student with skills and training in one highly concentrated area of the major. Concentrations are formally-recognized educational designations (including the assignment of a university plan code for reporting/record-keeping purposes and appearance on the ASU transcript). Concentrations are distinguished from more informal academic distinctions such as "emphases," "tracks," "foci," "options," etc.

This proposal template should be completed in full and submitted to the University Provost's Office [mail to: 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.

GRADUATE CONCENTRATION

College/School:	Thunderbird School of Global Management

Note: Program ownership is coded at the College/School level first and may not be a center, department or division apart from it.

Department/Division/School:	Thunderbird School of Global Management (CTB)
Proposing faculty group (if applicable)**:**	N/A

Existing graduate degree and major under which this concentration will be established:	Master of Global Management (MGM) in Global Management
Name of proposed concentration:	Data Science
Requested effective term and year: Fall	2020

(The first semester and year for which students may begin applying to the concentration)

Is a program fee required?	Yes, the same program fee of the MGM will apply to this concentration.

Note: for more information about program fee requests, visit https://provost.asu.edu/curriculum-development/changemaker/form-instructions#fees

Is the unit willing and able to implement the program if the fee is denied?	Yes, we are able to implement the program.

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 complete the ASU Online Offering form in Curriculum ChangeMaker to begin this request. Prior to completing the online Curriculum ChangeMaker form, please contact EdPlus at asuonline@asu.edu who can provide you with additional information regarding the online request process.

Do Not Fill in this information: Office Use Only **Plan Code:**	**CIP Code:**

PROPOSAL CONTACT			
Name:	Josh Allen	**Title:**	Director of Academic Programs
Phone number:	602.496.7001	**Email:**	joshallen@thunderbird.asu.edu

DEAN APPROVAL(S)
This proposal has been approved by all necessary unit and college/school levels of review, and the college/school(s) has the resources to offer this degree program. I recommend implementation of the proposed concentration.
Note: An electronic signature, an email from the dean or dean's designee, or a PDF of the signed signature page is acceptable.

College/School/Division Dean name: Sanjeev Khagram

Signature: *Sanjeev Khagram* **Date:** Jan 20, 2020

Please note: Proposals for new concentrations also require the review and recommendation of approval from the University Graduate Council, Curriculum and Academic Programs Committee (CAPC), the Academic Senate (Information item only), and the Office of the Provost before they can be put into operation.
The final approval notification will come from the Office of the Provost.

1. OVERVIEW

Provide a brief description *(no more than 150 words)* of the new concentration (including the focus of the new concentration, relationship to other concentrations within this degree program, etc.).

For the Master of Global Management (MGM) in Global Management, concentration in Data Science, the School of Computing, Informatics, and Decision Systems Engineering (CIDSE) will offer courses to MGM students enrolled at Thunderbird. Students will be able to gain global management and data management expertise that is applicable to careers in multinational corporations, international non-profit entities, government and non-government organizations around the globe. As these global companies and organizations continue to rely on data to drive management decisions, it will be increasingly more important for leaders to have skills necessary to understanding and interpreting that data. Students in this concentration will learn how to filter large amounts of data in order to lead their global organizations.

This new concentration addresses a market need in data analytics that is not currently covered in any of Thunderbird's other existing concentrations.

2. IMPACT ASSESSMENT

A. Explain the unit's need for the new concentration (e.g., market demand, research base, direction of the discipline, and interdisciplinary considerations). How will the new concentration complement the existing degree program, including enrollment, national ranking, etc.?

Jobs for computer and information research scientists are expected to grow 16 percent between 2016 and 2028 (Occupational Outlook Handbook, Bureau of Labor Statistics). Many companies report difficulties finding workers with solid systems, engineering, algorithmic, and mathematical backgrounds and excellent data management and analysis skills. To meet this market need, Thunderbird, with the help of CIDSE, has designed the Data Science concentration under the Master of Global Management degree program.

The target audience for the concentration is students desiring to work in public, private, or non-profit sectors that require knowledge of how to use large data systems to guide management decisions. Overall, students will be able to gain global management and data management skills that are applicable to many organizational settings. While Thunderbird's existing concentrations under the Master of Global Management cover many high-demand fields, this new concentration meets a particular field of study that hasn't been addressed yet. In a market intelligence report done by Acute Market Reports, the global big data analytics market was estimated to be US$37.34 billion in 2018 and is expected to grow to US$105.08 billion by 2027, particularly driven by the 4th

Industrial Revolution (e.g. Artificial intelligence and Internet of Things). The additional concentration will attract students to Thunderbird's MGM program and increase enrollments overall.

B. **Please identify other related ASU programs and describe how the new concentration will complement these existing ASU programs?** If applicable, statements of support from affected academic unit administrators should be included with this proposal submission.

Thunderbird has worked closely with the School of Computing, Informatics, and Decision Systems Engineering to develop this concentration. A copy of some of our correspondence has been attached in Appendix III. Both Thunderbird and CIDSE believe that this will add value to our current programs and concentrations. This concentration will attract business students to CIDSE and will increase Thunderbird's attractiveness to students who are interested in the technical side of many global companies and organizations.

In the development of this concentration, Thunderbird also reached out to the W. P. Carey School of Business, the New College of Interdisciplinary Arts and Sciences, the College of Integrative Sciences and Arts, the Fulton Schools of Engineering, and the Watts College of Public Service and Community Solutions, the College of Health Solutions, the School of Sustainability, the Mary Lou Fulton Teachers College, the Sandra Day O'Connor College of Law, and the School for the Future of Innovation in Society and all have expressed their support for this concentration. As ASU as a whole continues to work toward the design aspiration to "Engage Globally," every college will need to find its own niche in that space while being collaborative and supportive of other colleges. This concentration builds on the already existing family of highly sought-after data science programs within ASU to add a global management perspective as we move forward into the 4th industrial revolution.

(Impact Statements can be found in Appendix III.)

C. **Is this an interdisciplinary concentration?** If yes, please address the relationship of the proposed concentration to other existing degree programs and any parallel or similar concentrations in those degree programs. (Please include relevant Memoranda of Understanding regarding this interdisciplinary concentration from all applicable academic units.)

This concentration is interdisciplinary. Students will enroll in classes at Thunderbird and the School of Computing, Informatics, and Decision Systems Engineering (CIDSE). The global business courses will be taught at Thunderbird School of Global Management and the courses for the concentration in Data Science will be taught at CIDSE.

3. **STUDENT LEARNING OUTCOMES AND ASSESSMENT**

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.

(See Appendix II).

4. **CURRICULAR STRUCTURE**

Please ensure that all _new core_ course proposals have been submitted to the Provost's office through the Curriculum ChangeMaker online course proposal submission system before this initiative is put on the University Graduate Council and CAPC agendas.

Core Courses for the Degree – Common to all Concentrations			
Ensure the core listed below is the same as for the standalone degree			
Prefix and Number	**Course Title**	**New Course?**	**Credit Hours**
TGM 506	Communicating and Negotiating Across Cultures	No	3
		Section sub-total:	3
Required Concentration Courses			
Prefix and Number	**Course Title**	**New Course?**	**Credit Hours**

CSE 512	Distributed Database Systems	No	3
CSE 572 or IEE 520	CSE 572 Data Mining or IEE 520 Statistical Learning for Data Mining	No	3
Choose two of the following (6 credit hours)			
CSE 510	Database Management System Implementation	No	3
CSE 515	Multimedia and Web Databases	No	3
CSE 578	Data Visualization	No	3
CSE 546	Cloud Computing	Yes	3
CSE 573	Semantic Web Mining	Yes	3
		Section sub-total:	12
Electives *(as deemed necessary by supervisory committee)*			
Prefix and Number	**Course Title**	**New Course?**	**Credit Hours**
	Electives as approved by the academic unit	N/A	12
		Section sub-total:	12
Culminating Experience(s) – Common to all Concentrations *E.g. – Capstone course, portfolio, written comprehensive exam, applied project, thesis (must be 6 credit hours with oral defense), dissertation (must be 12 credit hours with oral defense)*			**Credit Hours**
Capstone Course - TGM 597 Thunderbird Integrative Experience			1
		Section sub-total:	1
Other Requirements – Common to all Concentrations *E.g. – internships, clinical requirements, field studies, foreign language exam as applicable* *(Except for TGM 596 and the foreign language requirement, other requirement courses may be substituted with approval of the academic unit)*			**Credit Hours**
Foreign Language as a Curriculum Requirement (see below)			
TGM 596 Thunderbird Experiential Practicum			6
TGM 545 Advanced Perspectives on Global Leadership and Strategy			3
TGM 557 Global Data and Marketing Analytics			3
TGM 515 Navigating Global and Regional Business Environments			3
TGM 517 Global Accounting and Financial Management			3
TGM 586 Global Entrepreneurship and Sustainable Business			3
		Section sub-total:	21
Total required credit hours			**49**

A. **Please describe the culminating experience(s) required for completion of the existing degree and major, and the proposed concentration** *(e.g., thesis, dissertation, comprehensive exams, capstone course, portfolio, applied project).*

Capstone Course - TGM 597 Thunderbird Integrative Experience - Course Description: Provides a capstone experience that integrates content from several business areas including strategy, finance, cross-cultural communication, supply chains, leadership, operations, and accounting. May take the form of an integrative

business computer simulation or a seminar drawing on faculty from a variety of business areas to highlight key issues in those areas.

Note: As part of the course, students will complete a written project to summarize their learnings.

B. **Please describe any other requirements for completion of the existing degree and major, and the proposed concentration** *(e.g., internships, clinical requirements, field studies, foreign language exam etc.).*

Foreign Language as a Curriculum Requirement (any language)

Proficiency in a second language is required for graduation from the MGM degree. Students whose native language is not English who meet the admission requirements for the MGM program satisfy the language requirement.

Students whose native language is English must satisfy the graduation requirement for language proficiency by waiving this requirement through an Oral Proficiency Interview (OPI) administered by a 3rd party vendor OR successfully completing 6 credit hours of 400 level or higher of foreign language coursework as part of the program electives.

5. COMPREHENSIVE EXAMS

(Please choose what is appropriate for the degree type selected)

A. **Master's Comprehensive Exam (when applicable), please select from the appropriate option.**

N/A

6. COURSES

A. **New Courses Required for Proposed Program:** Provide course prefix, number, title, credit hours and brief description for any new courses required for this program.

N/A

7. ADMINISTRATION AND RESOURCES

A. **Administration:** How will the proposed concentration be administered (including recommendations for admissions, student advisement, retention etc.)? Describe the administering body in detail, especially if the proposed concentration is part of a larger interdisciplinary initiative. How will the graduate support staffing needs for this proposed concentration program be met?

Professor Lena Booth, the Associate Dean of Graduate Programs at Thunderbird, will oversee admission, retention, and the overall program. In consultation with Allison Curran, the Assistant Director for Academic Services at the School of Computing, Informatics, and Decision Systems Engineering, Thunderbird will review applications, make admissions recommendations, and track enrollment and retention. Students will be assigned academic success specialists at Thunderbird for advisement.

B. **Projected Enrollment:** How many students will be admitted immediately following final approval of the concentration? What are enrollment projections for the next three years?

3-YEAR PROJECTED ANNUAL ENROLLMENT			
Please utilize the following tabular format	**1st Year**	**2nd Year** (Yr. 1 continuing + new entering)	**3rd Year** (Yr. 1 & 2 continuing + new entering)

Number of Students in concentration (Headcount)	10	20	30

Here are the current enrollments of Thunderbird's concentrations, launched in Fall 2019 (as of March 2020):

Master of Global Management (MGM) in Global Management	12
Master of Global Management (Nonprofit Leadership and Management)	0
Master of Global Management (Integrated Health Care)	0
Master of Global Management (Creative Industries and Design Thinking)	2
Master of Global Management (Global Legal Studies)	5
Master of Global Management (Global Health Care Delivery)	4
Master of Global Management (Sustainability Solutions)	0
Master of Global Management (Public Administration)	0
Master of Global Management (Global Digital Transformation)	21
Master of Global Management (Global Business)	64
Master of Global Management (Global Affairs)	13
Master of Global Management (Global Entrepreneurship)	6
Master of Global Management (Digital Audience Strategy)	2
Master of Global Management (Global Development and Innovation)	4
Master of Global Management (Sustainable Tourism)	2
Master of Global Management (Public Policy)	0

For comparison purposes, total enrollments in Wake Forest University's Master of Science in Business Analytics (10-month program) is 87 (source). The Fall 2019 entering Master of Science in Business Analytics class at the University of Texas at Austin was 109 (source). We were unable to gather data on the number of students in MBA programs with Data Analytics concentrations, but here are a few programs: Indiana University MBA – Business Analytics, University of Delaware MBA Business Analytics Specialization, and George Mason University MBA with a certificate in Business Analytics.

C. **Resource requirements needed to launch and sustain the program:** Describe any new resources required for this concentration's success such as new staff, new facilities, new library resources, new technology resources, etc. and include projected budget needs. If multiple units/programs will collaborate in offering this concentration, 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 concentration.

No new resources required

D. **Current Faculty:** Complete the table below for all current faculty members who will teach in the program.

Name	Rank	Highest Degree	Area of Specialization/Expertise	Estimated Level of Involvement
Lena Booth	Associate Professor	Ph.D.	Finance	10%
Mohamed Sarwat	Assistant Professor	Ph.D	Computer Science	20%

Abdelghany Aly Elsayed				
Anyan Bannerjee	Assistant Research Professor	Ph.D.	Data Mining	20%
K. Selcuk Candan	Professor	Ph.D.	Multimedia and Web data management	20%
Pree Sainam	Assistant Professor	Ph.D.	Marketing Analytics	20%
Mary Sully de Luque	Associate Professor	Ph.D.	Leadership	20%
Kannan Ramaswamy	Professor	Ph.D.	Strategy	10%
Seigyoung Auh	Professor	Ph.D.	Marketing	20%

8. REQUIRED SUPPORTING DOCUMENTS
(Please label accordingly, i.e., Appendix or Attachment A, B, etc.)

Please include the following with your proposal:

A. Statements of support from all deans (see Appendix III)

B. Impact statements of heads of impacted academic units (programs with similar names/content, utilizing courses, faculty, etc.) (see Appendix III)

APPENDIX I

OPERATIONAL INFORMATION FOR GRADUATE PROGRAMS

(This information is used to populate the <u>Graduate Programs Search</u>/catalog website.)

1. **Proposed name of concentration:** Data Science

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

Building on the No. 1-ranked Master of Global Management, this concentration in data science allows students to gain global management and data management skills that are applicable to multinational corporations, international non-profit entities, government, and non-government organizations around the globe.

3. **Provide a brief program description** *(Catalog type (i.e. will appear in Degree Search) – no more than 150 words. Do not include any admission or curriculum information)*

Jobs for computer and information research scientists are expected to grow 16 percent between 2016 and 2028 (Occupational Outlook Handbook, Bureau of Labor Statistics). Many companies report difficulties finding workers with solid systems, engineering, algorithmic, and mathematical backgrounds and with excellent data management and analysis skills. To meet this market need, Thunderbird designed the data science concentration under the Master of Global Management degree program in conjunction with the School of Computing, Informatics, and Decision Systems Engineering.

This concentration is offered to students who are interested in gaining both global management and data management expertise in order to work in multinational corporations, international non-profit entities, government and non-government organizations around the globe. As these global companies and organizations continue to rely on data to drive management decisions, it will be increasingly more important for leaders to have skills necessary to understand and interpret that data in the Fourth Industrial Revolution.

4. **Delivery/Campus Information Options:** On-campus only (ground courses and iCourses)

5. **Campus(es) where program will be offered:**

ASU Online curriculum consists of courses that have no face-to-face content. iCourses are online courses for students in on-campus programs. iCourses may be included in a program, but may not comprise the entirety of a program. On-campus programs must have some face-to-face content
Note: Office of the Provost approval is needed for ASU Online campus options.

☐ ASU Online only (<u>all</u> courses online and managed by ASU Online)

All other campus or location options (please select all that apply):

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

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

*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 <u>Philip Regier</u> (Executive Vice Provost and Dean) is required to offer programs through ASU Online. Please complete the ASU Online Offering form in <u>Curriculum ChangeMaker</u> to begin this request. Prior to completing the online Curriculum ChangeMaker form, please contact EdPlus at asuonline@asu.edu who can provide you with additional information regarding the online request process

6. **Admission Requirements**

An applicant must fulfill the requirements of both the Graduate College and Thunderbird School of Global Management.

Applicants are eligible to apply to the program if they have earned a bachelor's or master's degree in any subject from a regionally accredited institution.

Applicants must have a minimum cumulative GPA of 3.00 (scale is 4.00 = "A") in the last 60 hours of their first bachelor's degree program, or applicants must have a minimum cumulative GPA of 3.00 (scale is 4.00 = "A") in an applicable master's degree program.

Applicants are required to submit:

1. graduate admission application and application fee
2. official transcripts
3. professional resume
4. two letters of recommendation
5. GRE or GMAT score
6. proof of English proficiency

Additional Application Information

An applicant whose native language is not English must provide proof of English proficiency regardless of current residency.

7. **Application Review Terms (if applicable session):**

Indicate the first term and year in which applications will be opened for admission. Applications will be accepted on a rolling basis after that time.

   Note: It is the academic unit's responsibility to display program deadline dates on their website.

Terms	Years	University Late Fee Deadline
☒ Fall (regular) ☐ Session B	(year): 2020 (year):	July 1st October 1st
☒ Spring (regular) ☐ Session B	(year): 2021 (year):	December 1st February 8th
☒ Summer (regular) ☐ Summer B	(year): 2021 (year):	May 14th May 14th
Note: Session B is only available for approved online programs.		

   Program admission deadlines website address: Deadlines can be found on degree search.

8. **Curricular Requirements:**

Curricular Structure Breakdown for the Academic Catalog:
(To be completed by the Graduate College)

   49 credit hours, including a foreign language exam and the required capstone course (TGM 597)

   Required Core (3 credit hours)
   TGM 506 Communicating and Negotiating Across Cultures (3)

   Concentration (12 credit hours)
   CSE 512 Distributed Database Systems (3)

CSE 572 Data Mining (3) or IEE 520 Statistical Learning for Data Mining (3)
Choose two from the following:
CSE 510 Database Management System Implementation (3)
CSE 515 Multimedia and Web Databases (3)
CSE 546 Cloud Computing (3)
CSE 573 Semantic Web Mining (3)
CSE 578 Data Visualization (3)

Electives (12 credit hours)

Other Requirements (21 credit hours)
Foreign Language
TGM 515 Navigating Global and Regional Business Environments (3)
TGM 517 Global Accounting and Financial Management (3)
TGM 545 Advanced Perspectives on Global Leadership and Strategy (3)
TGM 557 Global Data and Marketing Analytics (3)
TGM 586 Global Entrepreneurship and Sustainable Business (3)
TGM 596 Thunderbird Experiential Practicum (6)

Culminating Experience (1 credit hour)
TGM 597 Thunderbird Integrative Experience (1)

Additional Curriculum Information
Electives are as approved by the academic unit.

Except for TGM 596 and the foreign language requirement, other requirements coursework may be substituted with approval of the academic unit.

Proficiency in a second language is required for graduation from the MGM degree. Students whose native language is not English who meet the admission requirements for the MGM program satisfy the language requirement.

Students whose native language is English must satisfy the graduation requirement for language proficiency by waiving this requirement through an oral proficiency interview administered by a third-party vendor or by successfully completing six credit hours of 400-level or higher of foreign language coursework.

9. **Allow 400-level courses:**   ☒ **Yes**   ☐ **No**
   Note: No more than six credit hours of 400-level coursework may be included on a graduate student plan of study.

10. **Keywords**: List all keywords that could be used to search for this concentration. Keywords should be specific to the proposed concentration – limit 10 keywords.

    Global, Data Management, Data Science, Analytics, Global Management

11. **Area(s) of Interest**

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

    ☐ Architecture & Construction   ☐ Interdisciplinary Studies
    ☐ Arts   ☐ Law & Justice
    ☒ Business   ☐ Mathematics
    ☐ Communication & Media   ☐ Psychology
    ☐ Education & Teaching   ☐ STEM
    ☐ Engineering & Technology   ☐ Science
    ☐ Entrepreneurship   ☐ Social and Behavioral Sciences
    ☐ Health & Wellness   ☐ Sustainability

☐ Humanities

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

☐ Architecture & Construction   ☐ Interdisciplinary Studies
☐ Arts   ☐ Law & Justice
☐ Business   ☐ Mathematics
☐ Communications & Media   ☐ Psychology
☐ Education & Teaching   ☐ STEM
☒ Engineering & Technology   ☐ Science
☐ Entrepreneurship   ☐ Social and Behavioral Sciences
☐ Health & Wellness   ☐ Sustainability
☐ Humanities

12. **Contact and Support Information:**

Office Location - Building Code & Room: (Search ASU map)	AZCTR 800
Campus Telephone Number: (may not be an individual's number)	602.496.7100
Program Email Address: (may not be an individual's email)	admissions.tbird@asu.edu
Program Website Address: (if one is not yet created, use unit website until one can be established)	https://thunderbird.asu.edu/degrees/graduate/master-global-management
Program Director (Name):	Josh Allen
Program Director (ASURITE):	rallen18
Program Support Staff (Name):	Heidi Bonilla
Program Support Staff (ASURITE):	hbonill1
Admissions Contact (Name):	Adam Henry
Admissions Contact (ASURITE):	Akhenry1

13. **Application and iPOS Recommendations:** List the Faculty and Staff that will input admission/POS recommendations to Gportal **and** indicate their approval for Admissions and/or POS:

NAME	ASURITE	ADMSN	POS
Josh Allen	rallen18	x	x
Adam Henry	Akhenry1	x	x
Kim Smart	kcsmart		x

Heidi Bonilla	hbonill1		x

University Office of Evaluation and Educational Effectiveness Academic Program Assessment Plan	12-13-2019

MGM in Data Science

Status:UOEEE Provisional Approval

Comments: Approved

Element			Outcome Measure Description
AP_2Goal	0		
Outcome	1		Students will demonstrate enhanced Social Capital.
Plan_2Concepts	1		The World Economic Forum reports that empathy and collaboration are two critical abilities for global manager success. These are equally critical for those seeking careers in the global marketplace. These abilities rely on the development of Social Capital. This program is designed to develop a student's Social Capital through field-based action learning, team-based projects, and stretch assignments.
Plan_3Competencies	1		Students will have the ability to build sustainable trusting relationships—the basis of Social Capital—with others from diverse parts of the world through development of intercultural empathy, the ability to have interpersonal impact, and to act with diplomacy.
AP_1Process	1	1	Pre- and post-test surveys of Global Mindset Inventory.
Measure	1	1	The Global Mindset Inventory will be used to assess development in Social Capital. A pre- and post-test will be used to assess change over time and program effect.
PC	1	1	At least 75% of the participants will achieve a 0.2 increase (on a five point scale) from pre- to post-test in the area of Social Capital. Based on the research done through the Global Mindset Institute, a 0.2 increase for Social Capital was determined to be practically significant.
Measure	1	2	Students who are surveyed at graduation will evaluate the quality of their program's ability to enhance their Social Capital.
PC	1	2	75% of surveyed students will rate the extent to which their program enhanced their Social Capital as Agree or Strongly Agree.

Element	Outcome	Measure	Description
Outcome	2		Students will be able to use big data analytics tools and develop frameworks that are critical for providing meaningful information to make business decisions.
Plan_2Concepts	2		With zettabytes of data being collected annually, governments, and companies, people have more access to data than ever before. With so much data, it is hard to know where to start looking for important insights or trends to drive business decisions. Hence it is not surprising to see a growing need for data scientists that can architect, implement, and manage large data systems for business decision making.
Plan_3Competencies	2		Students are able to make business decisions based on the data and information at hand, and make technical recommendations utilizing the knowledge skills developed.
AP_1Process	2	1	Exams and Real-world projects from required concentration coursework.
Measure	2	1	Students in CSE 512 Distributed Database Systems will be required to do a real-world project using the data management skills learned in the course.
PC	2	1	80% of the participants will meet or exceed expectations using faculty-developed grading rubric.
Measure	2	2	Students in CSE 572 Data Mining (or IEE 520 Statistical Learning for Data Mining) course will be required to take a final exam to determine if they are able to provide the first level of abstraction to raw data by extracting patterns and providing meaningful information to inform better business decisions.
PC	2	2	80% of students will earn a grade of grade of B or better on the final exam required in CSE 572 or IEE 520 as evaluated using a faculty-developed grading rubric.
Outcome	3		Students will have the necessary skills to communicate with technical and non-technical co-workers.
Plan_2Concepts	3		There is increasing demand from industry and government for data scientists with solid communication skills to bridge the communication gap between technical teams and management.
Plan_3Competencies	3		Students are able to effectively communicate between the technical team and management for sound decision making.
AP_1Process	3	1	Applied and Real-world projects from required concentration coursework.
Measure	3	1	Students in TGM 506 Communicating and Negotiating Across Cultures will be required to do a real-world project using the communication skills learned in this foundation course.
PC	3	1	75% of the participants will meet or exceed expectations using faculty-developed grading rubric.
Measure	3	2	Students in TGM 557 Global Data and Marketing Analytics will be required to do a real-world project using data visualization skills learned in this foundation course. The skills help communicate data results to inform business decision.
PC	3	2	75% of students will achieve the level Meets or Exceeds Expectations using the faculty-developed rubric.

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

APPENDIX III

Statements of Collaboration and Support

Thunderbird School of Global Management – Official Submission

From:	Josh Allen
To:	Curriculum Planning
Cc:	Lena Booth
Subject:	MGM Global Management - New Concentration in Data Science
Date:	Thursday, January 30, 2020 8:21:33 AM
Attachments:	MGM Global Mgt-Conc Data Science.pdf
	MGM Global Mgt-Conc Data Science.docx

Hi All,

Please see the proposal to establish a new graduate concentration for our MGM in Global Management program.

Thank you,
Josh

Josh Allen '08
Director of Academic Programs
Thunderbird School of Global Management
+1.602.496.7001
JoshAllen@Thunderbird.ASU.edu
Skype:josh.globalmba
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#1 MASTER'S IN MANAGEMENT

Times Higher Education/Wall Street Journal 2019

ASU Arizona State University | THUNDERBIRD SCHOOL OF GLOBAL MANAGEMENT

Thunderbird is a unit of the Arizona State University Knowledge Enterprise

From:	Lena Booth
Sent:	Tuesday, January 28, 2020 8:07 PM
To:	Josh Allen
Subject:	FW: Learning Outcome Assessment
Attachments:	Proposal-MS Computer Sci-Big Data Sys Conc[1].pdf

Josh, please see the email chain as evidence of CIDSE and Thunderbird's agreement to collaborate.

Lena

From: Soukaina Lamrani <slamrani@asu.edu>
Date: Tuesday, November 26, 2019 at 11:42 AM
To: Lena Booth <Lena.Booth@thunderbird.asu.edu>, Sandeep Gupta <Sandeep.Gupta@asu.edu>
Subject: Re: Learning Outcome Assessment

Dr. Booth,
I have attached what was originally submitted for MCS degree Big Data concentration as a reference.
Below is what I believe some learning outcomes that are more relevant to an MS in Global Management:

- Students will learn the big data analytics tools that are critical for providing meaningful information to make better business decisions.
- Students will be able to use tools and develop frameworks for federated and cloud based data storage, analysis, and modeling and mediated data services delivery.
- Students will have the necessary skills to communicate with technical and non-technical co-workers

The criteria for success is that students would be able to analyze big data systems and are able to produce and communicate technical results.

The measurements are going to be exams and real world projects where Satisfactory performance is indicated when the students are able to make business decisions based on the data and information at hand, make technical recommendations and are appropriately employed in an area utilizing the knowledge skills developed
Please let me know if this is good.

Best Regards,
Soukaina Lamrani
Manager Global Strategy in Advanced Engineering and Computing

slamrani@asu.edu

(Continued on next page)

From: Lena Booth <Lena.Booth@thunderbird.asu.edu>
Date: Tuesday, November 26, 2019 at 11:09 AM
To: Soukaina Lamrani <slamrani@asu.edu>, Sandeep Gupta <Sandeep.Gupta@asu.edu>
Subject: Re: Learning Outcome Assessment

Soukaina:

We need the learning outcome and the measurements, and the criteria for success, not just the description. Please see the second learning outcome assessment in each of the documents I sent in the previous email. Thanks.

Lena

From: Soukaina Lamrani <slamrani@asu.edu>
Date: Tuesday, November 26, 2019 at 10:55 AM
To: Lena Booth <Lena.Booth@thunderbird.asu.edu>, Sandeep Gupta <Sandeep.Gupta@asu.edu>
Subject: Re: Learning Outcome Assessment

Hi Dr. Booth,
Below is the description we gave for our Big Data:
" With zettabytes of data being collected annually, governments, companies, and people have more access to data than ever before. With so much data, it can be hard to know where to start looking for important insights or trends to drive business decisions.

Data mining techniques provide the first level of abstraction to raw data by extracting patterns, making big data analytics tools increasingly critical for providing meaningful information to inform better business decisions, and applying statistical learning theory to find a predictive function based on data.

You'll learn to apply mathematical theory and decision making techniques that are vital to big data analysis, classification, clustering, and association rule mining through real-world projects."

Best Regards,
Soukaina Lamrani
Manager Global Strategy in Advanced Engineering and Computing

slamrani@asu.edu

(Continued on next page)

From: Lena Booth <Lena.Booth@thunderbird.asu.edu>
Date: Tuesday, November 26, 2019 at 9:00 AM
To: Soukaina Lamrani <slamrani@asu.edu>, Sandeep Gupta <Sandeep.Gupta@asu.edu>
Subject: Learning Outcome Assessment

Dear Sandeep (and Soukaina):

I am excited that we had agreed on the set of courses for the Data Science concentration of the MGM below. The next step is to get the learning outcome assessment approved by the UOEEE. I am attaching a couple of learning outcome assessments from our other concentrations for you to review. Typically, we use 1 learning outcome from Thunderbird and 1 from the school where the concentration comes from. If you can provide me ONE learning outcome (it could be the same one from your Big Data concentration), I will work with UOEEE to get it approved.

Thanks,
Lena

MGM (Data Science)

Required Courses (6 credit hours)

- CSE 512 Distributed Database Systems (3)
- CSE 572 Data Mining (3) or IEE 520 Statistical Learning for Data Mining (3)

Student must choose two of the following courses (6 credit hours)

- CSE 510 Database Management System Implementation (3)
- CSE 515 Multimedia and Web Databases (3)
- CSE 575 Statistical Machine Learning (3)
- CSE 591 Data Visualization (3)
- CSE 591 Cloud Computing (3)
- CSE 591 Semantic Web Mining (3)

W. P. Carey School of Business – Impact Statement

From: Amy Hillman (DEAN) <AMY.HILLMAN@asu.edu>
Sent: Monday, December 16, 2019 10:10 AM
To: Sanjeev Khagram (Dean)
Subject: Re: Request for letters of support

We have no objections to this concentration.

Amy

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

On Dec 16, 2019, at 7:57 AM, Sanjeev Khagram (Dean) <Sanjeev.Khagram@thunderbird.asu.edu> wrote:

Dear Friends,

Amy requested the courses for the concentration but others maybe interested - see below:

MGM (Data Science)

Required Courses (6 credit hours)

CSE 512 Distributed Database Systems (3)
CSE 572 Data Mining (3) or IEE 520 Statistical Learning for Data Mining (3)

Student must choose two of the following courses (6 credit hours)

CSE 510 Database Management System Implementation (3)
CSE 515 Multimedia and Web Databases (3)
CSE 575 Statistical Machine Learning (3)
CSE 591 Data Visualization (3)
CSE 591 Cloud Computing (3)
CSE 591 Semantic Web Mining (3)

With Gratitude. Sanjeev

(Continued on next page)

From: Sanjeev Khagram (Dean) <Sanjeev.Khagram@thunderbird.asu.edu>
Sent: Saturday, December 14, 2019 8:51:50 AM
To: Kyle Squires <squires@asu.edu>; Patrick Kenney <pkenney@asu.edu>; Jonathan Koppell <koppell@asu.edu>; Duane Roen (Dean) <Duane.Roen@asu.edu>; Amy Hillman (DEAN) <AMY.HILLMAN@asu.edu>; Todd Sandrin (DEAN) <Todd.Sandrin@asu.edu>
Cc: Teresa Moya <Teresa.Moya@asu.edu>; Annette Bowers <Annette.Bowers@asu.edu>; Michelle Watson <Michelle.Watson@asu.edu>; Nicole Barr <Nicole.Barr@asu.edu>; Stacey Kimbell <kimbell@asu.edu>
Subject: Request for letters of support

Dear Friends,

We are collaborating with CIDSE of Fulton Engineering to propose a Data Science concentration for our Master of Global Management (MGM). The Grad College instructed us to request support letters from each of you. Thank you for your support - wishing all great graduations as well as a very peaceful and joyful holiday seaso

With Gratitude, Sanjeev

New College of Interdisciplinary Arts and Sciences – Impact Statement

From: Todd Sandrin (DEAN) <Todd.Sandrin@asu.edu>
Sent: Saturday, December 21, 2019 10:33 AM
To: Sanjeev Khagram (Dean)
Subject: RE: Request for letters of support

Thanks, Sanjeev. New College is happy to support development of this concentration. We look forward to collaborating to include some of these courses, where appropriate, in our Biological Data Science MS degree (https://newcollege.asu.edu/biological-data-science-ms) housed in our School of Mathematical and Natural Sciences. Our School of Social and Behavioral Sciences is also working to develop a degree program in Behavioral Data Science which is very distinct from the CSE courses and the curriculum you describe here.

Don't hesitate to let me know if my team or I can assist further.

Best,
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: Sanjeev Khagram (Dean) <Sanjeev.Khagram@thunderbird.asu.edu>
Sent: Monday, December 16, 2019 7:58 AM
To: Kyle Squires <squires@asu.edu>; Patrick Kenney <pkenney@asu.edu>; Jonathan Koppell <koppell@asu.edu>; Duane Roen (Dean) <Duane.Roen@asu.edu>; Amy Hillman (DEAN) <AMY.HILLMAN@asu.edu>; Todd Sandrin (DEAN) <Todd.Sandrin@asu.edu>
Cc: Teresa Moya <Teresa.Moya@asu.edu>; Annette Bowers <Annette.Bowers@asu.edu>; Michelle Watson <Michelle.Watson@asu.edu>; Nicole Barr <Nicole.Barr@asu.edu>; Stacey Kimbell <kimbell@asu.edu>
Subject: Re: Request for letters of support

Dear Friends,

Amy requested the courses for the concentration but others maybe interested - see below:

MGM (Data Science)

Required Courses (6 credit hours)

CSE 512 Distributed Database Systems (3)
CSE 572 Data Mining (3) or IEE 520 Statistical Learning for Data Mining (3)

Student must choose two of the following courses (6 credit hours)

CSE 510 Database Management System Implementation (3)
CSE 515 Multimedia and Web Databases (3)
CSE 575 Statistical Machine Learning (3)
CSE 591 Data Visualization (3)
CSE 591 Cloud Computing (3)
CSE 591 Semantic Web Mining (3)

With Gratitude, Sanjeev

Get Outlook for iOS

From: Sanjeev Khagram (Dean) <Sanjeev.Khagram@thunderbird.asu.edu>
Sent: Saturday, December 14, 2019 8:51:50 AM
To: Kyle Squires <squires@asu.edu>; Patrick Kenney <pkenney@asu.edu>; Jonathan Koppell <koppell@asu.edu>; Duane Roen (Dean) <Duane.Roen@asu.edu>; Amy Hillman (DEAN) <AMY.HILLMAN@asu.edu>; Todd Sandrin (DEAN) <Todd.Sandrin@asu.edu>
Cc: Teresa Moya <Teresa.Moya@asu.edu>; Annette Bowers <Annette.Bowers@asu.edu>; Michelle Watson <Michelle.Watson@asu.edu>; Nicole Barr <Nicole.Barr@asu.edu>; Stacey Kimbell <kimbell@asu.edu>
Subject: Request for letters of support

Dear Friends,

We are collaborating with CIDSE of Fulton Engineering to propose a Data Science concentration for our Master of Global Management (MGM). The Grad College instructed us to request support letters from each of you. Thank you for your support - wishing all great graduations as well as a very peaceful and joyful holiday seaso

With Gratitude, Sanjeev

From: Duane Roen (Dean) <Duane.Roen@asu.edu>
Sent: Monday, December 16, 2019 10:40:44 AM
To: Sanjeev Khagram (Dean) <Sanjeev.Khagram@thunderbird.asu.edu>
Subject: RE: Request for letters of support

Sanjeev,

CISA is happy to support the proposal.

Let me know if you need anything else.

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: Sanjeev Khagram (Dean)
Sent: Monday, December 16, 2019 7:58 AM
To: Kyle Squires <squires@asu.edu>; Patrick Kenney <pkenney@asu.edu>; Jonathan Koppell <koppell@asu.edu>; Duane Roen (Dean) <Duane.Roen@asu.edu>; Amy Hillman (DEAN) <AMY.HILLMAN@asu.edu>; Todd Sandrin (DEAN) <Todd.Sandrin@asu.edu>
Cc: Teresa Moya <Teresa.Moya@asu.edu>; Annette Bowers <Annette.Bowers@asu.edu>; Michelle Watson <Michelle.Watson@asu.edu>; Nicole Barr <Nicole.Barr@asu.edu>; Stacey Kimbell <kimbell@asu.edu>
Subject: Re: Request for letters of support

Dear Friends,

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CSE 515 Multimedia and Web Databases (3)
CSE 575 Statistical Machine Learning (3)
CSE 591 Data Visualization (3)
CSE 591 Cloud Computing (3)
CSE 591 Semantic Web Mining (3)

With Gratitude, Sanjeev

(Continued on next page)

From: Sanjeev Khagram (Dean) <Sanjeev.Khagram@thunderbird.asu.edu>
Sent: Saturday, December 14, 2019 8:51:50 AM
To: Kyle Squires <squires@asu.edu>; Patrick Kenney <pkenney@asu.edu>; Jonathan Koppell <koppell@asu.edu>; Duane Roen (Dean) <Duane.Roen@asu.edu>; Amy Hillman (DEAN) <AMY.HILLMAN@asu.edu>; Todd Sandrin (DEAN) <Todd.Sandrin@asu.edu>
Cc: Teresa Moya <Teresa.Moya@asu.edu>; Annette Bowers <Annette.Bowers@asu.edu>; Michelle Watson <Michelle.Watson@asu.edu>; Nicole Barr <Nicole.Barr@asu.edu>; Stacey Kimbell <kimbell@asu.edu>
Subject: Request for letters of support

Dear Friends,

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With Gratitude, Sanjeev

From: Kyle Squires <squires@asu.edu>
Date: Monday, January 20, 2020 at 11:47 AM
To: "Sanjeev Khagram (Dean)" <Sanjeev.Khagram@thunderbird.asu.edu>
Cc: Lena Booth <Lena.Booth@thunderbird.asu.edu>, Annette Bowers <Annette.Bowers@asu.edu>
Subject: RE: TIME SENSITIVE: Request for letters of support

Hi Sanjeev,
Apologies for the lag in following up. FSE is pleased to support the concentration and in general look forward to continuing to explore how to broaden (and deepen) connections into Thunderbird. We really see the value in some novel partnerships. Good luck!
  -- Kyle

From: Sanjeev Khagram (Dean) <Sanjeev.Khagram@thunderbird.asu.edu>
Sent: Tuesday, January 7, 2020 2:30 PM
To: Kyle Squires <squires@asu.edu>; Patrick Kenney <pkenney@asu.edu>; Jonathan Koppell <koppell@asu.edu>
Cc: Lena Booth <Lena.Booth@thunderbird.asu.edu>
Subject: TIME SENSITIVE: Request for letters of support

Dear Patrick, Kyle and Jonathan,

Bumping this to the top if your in-boxes!

Happy 2020, Sanjeev

Get Outlook for iOS

From: Sanjeev Khagram (Dean) <Sanjeev.Khagram@thunderbird.asu.edu>
Sent: Monday, December 16, 2019 7:57 AM
To: Kyle Squires; Patrick Kenney; Jonathan Koppell; Duane Roen (Dean); Amy Hillman (DEAN); Todd Sandrin (DEAN)
Cc: Teresa Moya; Annette Bowers; Michelle Watson; Nicole Barr; Stacey Kimbell
Subject: Re: Request for letters of support

Dear Friends,

Amy requested the courses for the concentration but others maybe interested - see below:

MGM (Data Science)

Required Courses (6 credit hours)
 CSE 512 Distributed Database Systems (3)
 CSE 572 Data Mining (3) or IEE 520 Statistical Learning for Data Mining (3)

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 CSE 575 Statistical Machine Learning (3)
 CSE 591 Data Visualization (3)
 CSE 591 Cloud Computing (3)
 CSE 591 Semantic Web Mining (3)

With Gratitude, Sanjeev

Get Outlook for iOS

From: Sanjeev Khagram (Dean) <Sanjeev.Khagram@thunderbird.asu.edu>
Sent: Saturday, December 14, 2019 8:51:50 AM
To: Kyle Squires <squires@asu.edu>; Patrick Kenney <pkenney@asu.edu>; Jonathan Koppell <koppell@asu.edu>; Duane Roen (Dean) <Duane.Roen@asu.edu>; Amy Hillman (DEAN) <AMY.HILLMAN@asu.edu>; Todd Sandrin (DEAN) <Todd.Sandrin@asu.edu>
Cc: Teresa Moya <Teresa.Moya@asu.edu>; Annette Bowers <Annette.Bowers@asu.edu>; Michelle Watson <Michelle.Watson@asu.edu>; Nicole Barr <Nicole.Barr@asu.edu>; Stacey Kimbell <kimbell@asu.edu>
Subject: Request for letters of support

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With Gratitude, Sanjeev

From: "Sanjeev Khagram (Dean)" <Sanjeev.Khagram@thunderbird.asu.edu>
Date: Monday, January 20, 2020 at 4:32 PM
To: William Terrill <wcterrill@gmail.com>
Cc: Lena Booth <Lena.Booth@thunderbird.asu.edu>
Subject: Re: FW: Request for letters of support

Absolutely William,

I believe we should all have data science concentrations.

Thank you, Sanjeev

From: William Terrill <wcterrill@gmail.com>
Sent: Tuesday, January 21, 2020 12:23 AM
To: Sanjeev Khagram (Dean)
Subject: Fwd: FW: Request for letters of support

Sanjeev,

My sincere apology in a delayed response.

The Watts College has no objections although we would like to reserve the right to potentially create a data science concentration in our own degrees.

Thank you,
Bill

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*

(Continued on next page)

---------- Forwarded message ---------
From: **Jonathan Koppell** <koppell@asu.edu>
Date: Tue, Dec 24, 2019 at 3:52 PM
Subject: FW: Request for letters of support
To: william.terrill@asu.edu <william.terrill@asu.edu>
Cc: Cynthia Lietz <clietz@asu.edu>

From: Sanjeev Khagram (Dean) <Sanjeev.Khagram@thunderbird.asu.edu>

Sent: Monday, December 16, 2019 7:58 AM
To: Kyle Squires <squires@asu.edu>; Patrick Kenney <pkenney@asu.edu>; Jonathan Koppell <koppell@asu.edu>; Duane Roen (Dean) <Duane.Roen@asu.edu>; Amy Hillman (DEAN) <AMY.HILLMAN@asu.edu>; Todd Sandrin (DEAN) <Todd.Sandrin@asu.edu>
Cc: Teresa Moya <Teresa.Moya@asu.edu>; Annette Bowers <Annette.Bowers@asu.edu>; Michelle Watson <Michelle.Watson@asu.edu>; Nicole Barr <Nicole.Barr@asu.edu>; Stacey Kimbell <kimbell@asu.edu>
Subject: Re: Request for letters of support

Dear Friends,

Amy requested the courses for the concentration but others maybe interested - see below:
MGM (Data Science)
Required Courses (6 credit hours)
CSE 512 Distributed Database Systems (3)
CSE 572 Data Mining (3) or IEE 520 Statistical Learning for Data Mining (3)

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CSE 515 Multimedia and Web Databases (3)
CSE 575 Statistical Machine Learning (3)
CSE 591 Data Visualization (3)
CSE 591 Cloud Computing (3)
CSE 591 Semantic Web Mining (3)

With Gratitude, Sanjeev

Get Outlook for iOS

From: Sanjeev Khagram (Dean) <Sanjeev.Khagram@thunderbird.asu.edu>
Sent: Saturday, December 14, 2019 8:51:50 AM
To: Kyle Squires <squires@asu.edu>; Patrick Kenney <pkenney@asu.edu>; Jonathan Koppell <koppell@asu.edu>; Duane Roen (Dean) <Duane.Roen@asu.edu>; Amy Hillman (DEAN) <AMY.HILLMAN@asu.edu>; Todd Sandrin (DEAN) <Todd.Sandrin@asu.edu>
Cc: Teresa Moya <Teresa.Moya@asu.edu>; Annette Bowers <Annette.Bowers@asu.edu>; Michelle Watson <Michelle.Watson@asu.edu>; Nicole Barr <Nicole.Barr@asu.edu>; Stacey Kimbell <kimbell@asu.edu>
Subject: Request for letters of support

Dear Friends,

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With Gratitude, Sanjeev

Get Outlook for iOS

From:	Lena Booth
To:	Josh Allen
Subject:	FW: Requesting Letter of Support
Date:	Friday, February 7, 2020 8:45:07 AM
Attachments:	image001.png
	image002.png

fyi

From: Fabio Milner <milner@asu.edu>
Date: Friday, February 7, 2020 at 1:13 AM
To: Lena Booth <Lena.Booth@thunderbird.asu.edu>
Cc: Fabio Milner <milner@asu.edu>
Subject: Re: Requesting Letter of Support

Dear Lena,

The College of Liberal Arts and Sciences supports Thunderbird's Data Science concentration for your Master of Global Management program.

Best,
Fabio

Fabio Augusto Milner, PhD
Associate Dean of Graduate Initiatives
The College of Liberal Arts and Sciences
Director of Mathematics for STEM Education
School of Mathematical and Statistical Sciences
Arizona State University

Armstrong Hall, Office 214
P: 480/965-5877 | F: 480/965-2110
milner@asu.edu
URL: https://thecollege.asu.edu/content/fabio-milner

From: Fabio Milner <milner@asu.edu>
Date: Thursday, February 6, 2020 at 19:05
To: Lena Booth <Lena.Booth@thunderbird.asu.edu>
Cc: Fabio Milner <milner@asu.edu>
Subject: Re: Requesting Letter of Support

Dear Lena,

We are meeting with the deans to discuss the bigger picture of data science degrees and certificates across the university.
I hope to have an answer for you next week.

Best,
Fabio

Fabio Augusto Milner, PhD
Associate Dean of Graduate Initiatives
The College of Liberal Arts and Sciences
Director of Mathematics for STEM Education
School of Mathematical and Statistical Sciences
Arizona State University

ASU The College
of Liberal Arts and Sciences
Arizona State University

Armstrong Hall, Office 214
P: 480/965-5877 | F: 480/965-2110
milner@asu.edu
URL: https://thecollege.asu.edu/content/fabio-milner

From: Lena Booth <Lena.Booth@thunderbird.asu.edu>
Date: Thursday, February 6, 2020 at 18:37
To: Fabio Milner <fmilner@asu.edu>
Subject: FW: Requesting Letter of Support
Resent-From: <milner@asu.edu>

How are you Fabio? Hope this email finds you well.

I was wondering if you have a chance to review our proposal to offer a Data Science concentration for our Master of Global Management program or are the right person at The College to provide letter of support. Do you mind letting me know? If you are not the right person, could you please point me to the right person?

Thanks very much,
Lena

From: Lena Booth <Lena.Booth@thunderbird.asu.edu>
Date: Wednesday, January 29, 2020 at 4:44 PM
To: Fabio Milner <fmilner@asu.edu>
Subject: Requesting Letter of Support

Dear Fabio:

Thunderbird is collaborating with CIDSE to offer a Data Science concentration for our Master of Global Management program. We would like to request a letter of support from the College of Liberal Arts and Sciences. The proposal requires students take the following courses for their concentration:

Required Courses (6 credit hours)

CSE 512 Distributed Database Systems (3)

CSE 572 Data Mining (3) or IEE 520 Statistical Learning for Data Mining (3)

Student must choose two of the following courses (6 credit hours)

CSE 510 Database Management System Implementation (3)

CSE 515 Multimedia and Web Databases (3)

CSE 575 Statistical Machine Learning (3)

CSE 591 Data Visualization (3)

CSE 591 Cloud Computing (3)

CSE 591 Semantic Web Mining (3)

These are all existing courses offered by CIDSE. The full proposal for the concentration is attached. We look forward to hearing from you by Jan 31, 2020. Thank you in advance for your support.

Lena

Lena C. Booth, Ph.D. | Associate Dean of Academic Programs and Finance Professor | Thunderbird School of Global Management | 400 E Van Buren, Suite 800 | Phoenix, AZ 85004 | Phone: 602-496-7061 | Email: lena.booth@thunderbird.asu.edu | Website: http://www.thunderbird.edu

From: Julie Liss <JULIE.LISS@asu.edu>
Date: Tuesday, March 24, 2020 at 1:38 PM
To: Lena Booth <Lena.Booth@thunderbird.asu.edu>, Kate Lehman
<KATE.LEHMAN@asu.edu>, Kate Brown <KateBrown@asu.edu>, Stavros Kavouras
<Stavros.Kavouras@asu.edu>
Subject: Re: Requesting Letter of Support

Lena:

The College of Health Solutions has reviewed the proposal to add a concentration in Data Science in
its Master of Global Management. We see no negative effect on our degree programs and offer our
support for the addition of the proposed concentration.

Sincerely,
Julie

From: Lena Booth <Lena.Booth@thunderbird.asu.edu>
Date: Tuesday, March 24, 2020 at 12:44 PM
To: Julie Liss <JULIE.LISS@asu.edu>, Kate Lehman <KATE.LEHMAN@asu.edu>, Kate Brown
<KateBrown@asu.edu>, Stavros Kavouras <Stavros.Kavouras@asu.edu>
Subject: Re: Requesting Letter of Support

Thanks very much Julie. Look forward to hearing from you.

Lena

From: Julie Liss <JULIE.LISS@asu.edu>
Date: Tuesday, March 24, 2020 at 12:43 PM
To: Lena Booth <Lena.Booth@thunderbird.asu.edu>, Kate Lehman
<KATE.LEHMAN@asu.edu>, Kate Brown <KateBrown@asu.edu>, Stavros Kavouras
<Stavros.Kavouras@asu.edu>
Subject: FW: Requesting Letter of Support

Hi Lena,
Thanks for alerting me to this—our team will take a look and get our letter of support to you ASAP.
Thanks,
Julie

From: Lena Booth <Lena.Booth@thunderbird.asu.edu>
Date: Friday, March 20, 2020 at 11:29 AM
To: Julie Liss <JULIE.LISS@asu.edu>
Subject: Re: Requesting Letter of Support

Sorry, here's the attachment of the full proposal.

Lena

From: Lena Booth <Lena.Booth@thunderbird.asu.edu>
Date: Friday, March 20, 2020 at 11:27 AM
To: Julie Liss <JULIE.LISS@asu.edu>
Subject: Requesting Letter of Support

Dear Julie:

How are you? Hope this email finds you well.

Thunderbird is collaborating with CIDSE to offer a Data Science concentration for our Master of Global Management program. We would like to request a letter of support from the College of Health Solutions. The proposal requires students take the following courses for their concentration:

Required Courses (6 credit hours)
CSE 512 Distributed Database Systems (3)
CSE 572 Data Mining (3) or IEE 520 Statistical Learning for Data Mining (3)

Student must choose two of the following courses (6 credit hours)
CSE 510 Database Management System Implementation (3)
CSE 515 Multimedia and Web Databases (3)
CSE 575 Statistical Machine Learning (3)
CSE 591 Data Visualization (3)
CSE 591 Cloud Computing (3)
CSE 591 Semantic Web Mining (3)   ·

These are all existing courses offered by CIDSE. The full proposal for the concentration is attached. We look forward to hearing from you by Tuesday, March 24, 2020. Thank you in advance for your support.

Lena

Lena C. Booth, Ph.D. | Associate Dean of Academic Programs and Finance Professor | Thunderbird School of Global Management | 400 E Van Buren, Suite 800 | Phoenix, AZ 85004 | Phone: 602-496-7061 | Email: lena.booth@thunderbird.asu.edu | Website: http://www.thunderbird.edu

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#1 MASTER'S IN MANAGEMENT

Times Higher Education/Wall Street Journal 2019

ASU Arizona State University | **THUNDERBIRD** SCHOOL OF GLOBAL MANAGEMENT

Thunderbird is a unit of the Arizona State University Enterprise

From: Christopher Boone <Christopher.G.Boone@asu.edu>
Date: Friday, March 20, 2020 at 3:45 PM
To: "Sanjeev Khagram (Dean)" <Sanjeev.Khagram@thunderbird.asu.edu>, "Carole Basile (Dean)" <Carole.Basile@asu.edu>
Cc: Lena Booth <Lena.Booth@thunderbird.asu.edu>, Ghazal Khorshidi <Ghazal.Khorshidi@thunderbird.asu.edu>
Subject: RE: request for support - 5 minutes of your time

The School of Sustainability is happy to support this proposal.

Christopher Boone
Dean and Professor

ASU School of Sustainability
Arizona State University

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SchoolOfSustainability.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: Sanjeev Khagram (Dean) <Sanjeev.Khagram@thunderbird.asu.edu>
Sent: Friday, March 20, 2020 1:16 PM
To: Carole Basile (Dean) <Carole.Basile@asu.edu>; Christopher Boone <Christopher.G.Boone@asu.edu>
Cc: Lena Booth <Lena.Booth@thunderbird.asu.edu>; Ghazal Khorshidi <Ghazal.Khorshidi@thunderbird.asu.edu>
Subject: request for support - 5 minutes of your time

Dear Carole and Chris:

Hope this email finds you safe and healthy during these very uncertain times. I think we Deans should have a virtual happy hour!

I need 5 minutes of your time. Thunderbird is collaborating with CIDSE to offer a Data Science concentration for our Master of Global Management program. We need a letter of support from your school/college. The proposal requires students take the following courses for their concentration:

Required Courses (6 credit hours)
CSE 512 Distributed Database Systems (3)
CSE 572 Data Mining (3) or IEE 520 Statistical Learning for Data Mining (3)

Student must choose two of the following courses (6 credit hours)
CSE 510 Database Management System Implementation (3)
CSE 515 Multimedia and Web Databases (3)
CSE 575 Statistical Machine Learning (3)
CSE 591 Data Visualization (3)
CSE 591 Cloud Computing (3)
CSE 591 Semantic Web Mining (3)

These are all existing courses offered by CIDSE. The full proposal for the concentration is attached. I would appreciate it if I could hear from you by Tuesday, March 24, 2020. Thank you in advance for your support.

With Gratitude, Sanjeev

From: "Carole Basile (Dean)" <Carole.Basile@asu.edu>
Date: Friday, March 20, 2020 at 3:57 PM
To: Christopher Boone <Christopher.G.Boone@asu.edu>
Cc: "Sanjeev Khagram (Dean)" <Sanjeev.Khagram@thunderbird.asu.edu>, Lena Booth
<Lena.Booth@thunderbird.asu.edu>, Ghazal Khorshidi
<Ghazal.Khorshidi@thunderbird.asu.edu>
Subject: Re: request for support - 5 minutes of your time

The Teachers College is also happy to support the proposal.

cb

Carole G. Basile
Dean
Arizona State University
Mary Lou Fulton Teachers College
P.O. Box 871811, Tempe, AZ 85281-1811
O: 480.965.3463 | **M:** 480.310.6887

> **From:** Sanjeev Khagram (Dean) <Sanjeev.Khagram@thunderbird.asu.edu>
> **Sent:** Friday, March 20, 2020 1:16 PM
> **To:** Carole Basile (Dean) <Carole.Basile@asu.edu>; Christopher Boone
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attached. I would appreciate it if I could hear from you by Tuesday, March 24, 2020. Thank
you in advance for your support.

With Gratitude, Sanjeev

From: Adam Chodorow <Adam.Chodorow@asu.edu>
Date: Friday, March 20, 2020 at 11:38 AM
To: Lena Booth <Lena.Booth@thunderbird.asu.edu>
Subject: RE: Requesting Letter of Support

Dear Lena,

These are, indeed, trying times. The law school supports this proposal. Adam

_____

Adam Chodorow

Associate Dean for Academic Affairs Jack E. Brown

Professor of Law

Sandra Day O'Connor College of Law, Arizona State University Mail Code 9520, 111

E. Taylor St, Phoenix, AZ 85004

Tel: (480) 727-8574

Fax: (480) 965-2427

Email: Adam.Chodorow@asu.edu SSRN:

http://ssrn.com/author=474399

From: Lena Booth <Lena.Booth@thunderbird.asu.edu>
Sent: Friday, March 20, 2020 11:33 AM
To: Adam Chodorow <Adam.Chodorow@asu.edu>

Subject: Requesting Letter of Support

Dear Adam:

How are you? Hope this email finds you well and healthy during these very uncertain times.

Thunderbird is collaborating with CIDSE to offer a Data Science concentration for our Master of Global Management program. We would like to request a letter of support from the Sandra Day O'Connor College of Law. The proposal requires students take the following courses for their concentration:

Required Courses (6 credit hours)
CSE 512 Distributed Database Systems (3)
CSE 572 Data Mining (3) or IEE 520 Statistical Learning for Data Mining (3)

Student must choose two of the following courses (6 credit hours) CSE 510 Database
Management System Implementation (3)

CSE 515 Multimedia and Web Databases (3) CSE 575 Statistical
Machine Learning (3)
CSE 591 Data Visualization (3)
CSE 591 Cloud Computing (3)
CSE 591 Semantic Web Mining (3)

These are all existing courses offered by CIDSE. The full proposal for the concentration is attached. We look forward to hearing from you by Tuesday, March 24, 2020. Thank you in advance for your support.

Lena

Lena C. Booth, Ph.D. | Associate Dean of Academic Programs and Finance Professor | Thunderbird School of Global Management | 400 E Van Buren, Suite 800 | Phoenix, AZ 85004 | Phone: 602-496-7061 | Email: lena.booth@thunderbird.asu.edu | Website: http://www.thunderbird.edu

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Times Higher Education/Wall Street Journal 2019

Thunderbird is a unit of the Arizona State University Enterprise

From: David Guston <David.Guston@asu.edu>
Date: Friday, March 20, 2020 at 4:17 PM
To: Lena Booth <Lena.Booth@thunderbird.asu.edu>
Cc: Katina Michael <katina.michael@asu.edu>, Jameson Wetmore <jmwetmor@asu.edu>
Subject: Re: Requesting Letter of Support

Lena

SFIS has no objections to the proposal as constructed.

Students wishing to find courses on the social/political/ethical aspects of big data and its use might find electives, if space is available for them in the curriculum, from SFIS.

Dave

David H. Guston
Foundation Professor
Director
School for the Future of Innovation in Society (SFIS)
Co-director
Consortium for Science, Policy and Outcomes (CSPO)
Interim Co-director
Institute for the Future of Innovation in Society (IFIS)

(NEW GRADUATE INITIATIVES)

PROPOSAL PROCEDURES CHECKLIST

Academic units should adhere to the following procedures when requesting new curricular initiatives (degrees, concentrations or certificates).

☐ **Obtain the required approval from the Office of the Provost to move the initiative forward for internal ASU governance reviews/approvals. Please see the academic strategic plan website at: https://provost.asu.edu/curriculum-development.**

☐ **Submit any new courses that will be required for the new curricular program to the Curriculum ChangeMaker online course approval system for review and approval.**

- Additional information can be found at the Provost's Office Curriculum Development website: Courses link
- For questions regarding proposing new courses, send an email to: courses@asu.edu

☐ **Prepare the applicable proposal template and operational appendix for the proposed initiative.**

☐ **Obtain letters or memos of support or collaboration (if applicable).**

- When resources (faculty or courses) from another academic unit will be utilized
- When other academic units may be impacted by the proposed program request
- if the program will have an online delivery option support will be required from the Provost's office and ASU Online. (*Please complete the ASU Online Offering form in Curriculum ChangeMaker to begin this request.*)

☐ **Obtain the internal reviews/approvals of the academic unit.**

- Internal faculty governance review committee(s)
- academic unit head (e.g. Department Chair or School Director)
- academic unit Dean (will submit approved proposal to the curriculumplanning@asu.edu email account for further ASU internal governance reviews (as applicable, University Graduate Council, CAPC and Senate)

Additional Recommendations

All new graduate programs require specific processes and procedures to maintain a successful degree program. Below are items that the Graduate College strongly recommends that academic units establish after the program is approved for implementation.

☐ **Establish satisfactory academic progress policies, processes and guidelines** – Check within the proposing academic unit and/or college to see if there are existing academic progress policies and processes in place. If none have been established, please go to http://graduate.asu.edu/faculty_staff/policies and scroll down to the **academic progress review and remediation processes** (for faculty and staff) section to locate the reference tool and samples for establishing these procedures.

☐ **Establish a Graduate Student Handbook for the new degree program** – Students need to know the specific requirements and milestones they must meet throughout their degree program. A Graduate Student Handbook provided to students when they are admitted to the degree program and published on the website for the new degree gives students this information. Include in the handbook the unit/college satisfactory academic progress policies, current degree program requirements (outlined in the approved proposal) and provide a link to the Graduate Policies and Procedures website. Please go to http://graduate.asu.edu/faculty_staff/policies to access Graduate Policies and Procedures.