

# Arizona State University

## Academic Strategic Plan Archive For 2023-2024 Planning



This document provides an archival record of the Arizona State University academic strategic plan addendum submitted during the 2022-2023 academic year for 2023-2024 planning. The Arizona Board of Regents Academic Strategic Plans Policy (2-223) states that this institution is required to submit an annual strategic plan for approval, which includes new academic programs, certain program eliminations and organizational unit changes. Other changes are reviewed as part of ASU's internal academic plan.

Note: Inclusion in this document does not indicate that the program or change has been approved by the university. This document only notates programs and changes which were approved for the 2023-2024 planning process.

## **About this Document**

To navigate this version of the Academic Strategic Plan Archive, refer to the table of contents and the bookmarks provided. The table of contents provides a hyperlinked listing of resources in the order in which they appear in this document. Keyword searches may be employed as an additional means of locating resources within this document.

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## EXECUTIVE SUMMARY

**Item Name:** Request for New Academic Organizational Units for Arizona State University

☒ Action Item

**Requested Action:** Arizona State University asks the board to approve the new academic organizational unit requests effective in the 2023-2024 catalog year.

### Background/History of Previous Board Action

As provided in the board policy, new academic unit requests may be submitted throughout the year with the approval of the Academic Affairs and Educational Attainment Committee.

### Discussion

To advance our charter mission to assume fundamental responsibility for the economic, social, cultural, and overall health of the communities we serve, ASU proposes the following new schools to support strategic growth on the Polytechnic and West campuses:

- School of Technology, Innovation and Entrepreneurship
- School of Interdisciplinary Forensics
- School of Integrated Engineering
- School of Counseling and Counseling Psychology
- School of Applied Professional Studies
- School of Applied Sciences and Arts

The schools will simultaneously house existing curriculum, catalyze the establishment of innovative degree programs, and focus scholarly efforts in the areas of entrepreneurship and business, forensics, engineering, counseling and counseling psychology, professional studies, and applied sciences and arts.

### Committee Review and Recommendation

The Academic Affairs and Educational Attainment Committee reviewed this item at its January 26, 2023 meeting and recommended forwarding the item to the full board for approval.

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## **EXECUTIVE SUMMARY**

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### **Statutory/Policy Requirements**

ABOR Policy 2-223 “Academic Locations, Degree Programs and Organizational Units”

## EXECUTIVE SUMMARY

### Request to Establish a New Academic Organizational Unit

University: Arizona State University

<b>Name of Organizational Unit:</b>  School of Technology, Innovation and Entrepreneurship
<b>Academic Department:</b> <i>The name of the academic department or college in which the organizational unit will be located</i>  W. P. Carey School of Business
<b>Geographic Site:</b> <i>The physical site (campus, extended campus, etc.) where the organizational unit will be located</i>  West campus
<b>Proposed Inception Term:</b> <i>The term and year in which the new organizational unit will begin operating</i>  Fall 2023
<b>Brief Description:</b> <i>A short outline of the activities that the organizational unit will perform. Please include, as applicable, a list of the degree and certificate programs that the unit will offer with estimates of the number of students served; an outline of research activities; public service and other significant activities.</i>  This interdisciplinary school within the W. P. Carey School of Business focuses on sparking positive change in the world by: <ul style="list-style-type: none"><li>• educating students to become business leaders with an entrepreneurial and innovation-focused mindset with deep knowledge of technology and its implications for business success</li><li>• producing groundbreaking and impactful research related to technology, innovation and entrepreneurship, and</li><li>• engaging with the West Valley community, businesses and government to provide experiential learning, project-focused coursework, and unique service opportunities for students</li></ul> This school will: <ul style="list-style-type: none"><li>▪ design technology, innovation and entrepreneurship specific courses to enhance new and existing entrepreneurship and technology-oriented degree/certificate offerings</li><li>▪ develop new centers and initiatives related to entrepreneurship and innovation to enhance student enrollment and retention, offer unique continuing and executive</li></ul>

## EXECUTIVE SUMMARY

education programs, pursue cutting-edge research, as well as engage West Valley corporations and community organizations

The following new degrees will be offered in the new school:

- BA in Entrepreneurial Leadership (*West campus*)
- BA in Business and Technology Solutions (*West and Polytechnic campus*)

The new degrees will complement the other 16 undergraduate degrees, three graduate degrees and three certificates offered by W. P. Carey at the West campus.

This new school will provide rigorous education and research opportunities in innovation and entrepreneurship embedded in West Valley communities. It is a crucial piece of ASU's strategy for growth in that region and an essential tool for assuming fundamental responsibility for the health of the communities we serve.

### **Reason for Establishing the Organizational Unit:**

*Please briefly explain why the organizational unit is being created:*

The new school will provide an academic home for technology, innovation and entrepreneurship on the West campus, and align W. P. Carey's efforts to expand access to entrepreneurial-based education programs to a diverse and underserved population.

### **Resources**

*Please provide information about the personnel and infrastructure required to create this new unit, and an estimate of the costs associated.*

This new school will require a school director, tenure-track and career-track faculty hired as clusters to support new programmatic areas, and academic and administrative support staff. The additional resources will be supported by student enrollment and the reallocation of existing resources. Enrollment growth is expected to be robust as a result of prioritizing expansion of the West campus, the unique niche filled by this school in supporting economic growth, and the new degree programs to be offered.

## EXECUTIVE SUMMARY

### Request to Establish a New Academic Organizational Unit

University: Arizona State University

<b>Name of Organizational Unit:</b>  School of Interdisciplinary Forensics
<b>Academic Department:</b> <i>The name of the academic department or college in which the organizational unit will be located</i>  New College of Interdisciplinary Arts and Sciences
<b>Geographic Site:</b> <i>The physical site (campus, extended campus, etc.) where the organizational unit will be located</i>  West campus
<b>Proposed Inception Term:</b> <i>The term and year in which the new organizational unit will begin operating</i>  Fall 2023
<b>Brief Description:</b> <i>A short outline of the activities that the organizational unit will perform. Please include, as applicable, a list of the degree and certificate programs that the unit will offer with estimates of the number of students served; an outline of research activities; public service and other significant activities.</i>  The School of Interdisciplinary Forensics will focus on the diverse sciences underpinning forensics and its myriad of applications.  By leveraging what has quickly become a signature program in the New College of Interdisciplinary Arts and Sciences, ASU will extend forensics applications across traditional and non-traditional disciplines. While forensics play a vital role in the administration of justice, it is a highly interdisciplinary field – which encompasses psychology, engineering, nursing, accounting, anthropology, biology, and the environment. The school will blend scientific rigor and technical training in ways expressly designed to address systemic inequities and safeguard human rights.  Current degree programs that will be moved into this new school include the BS in Forensic Science, the BA and BS in Forensic Psychology, the MS in Forensic Psychology, and the PSM in Forensic Science. These programs currently serve 1,950 undergraduate students and 300 graduate students. The school is also expected to support future interdisciplinary forensic science-based programs in chemistry, biology, anthropology and environmental science. Housing these interdisciplinary programs together is anticipated to create collaborations that will attract students and faculty, and lead to use-inspired research not possible in the traditional disciplines.



## EXECUTIVE SUMMARY

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The new school will provide additional opportunities for applied sciences for the diverse communities in the West Valley and is a crucial part of ASU's strategy for growth in that region.

### **Reason for Establishing the Organizational Unit:**

Please briefly explain why the organizational unit is being created:

The School of Interdisciplinary Forensics will bring the forensic programs in the New College of Interdisciplinary Arts and Sciences formally under one school – strengthening the disciplinary-focus and aligning resources.

### **Resources**

*Please provide information about the personnel and infrastructure required to create this new unit, and an estimate of the costs associated.*

The new school will require a school director, several additional faculty hires pursued in clusters to support new degree programs, and advising and support staff. The additional resources will be supported by student enrollment and the reallocation of existing resources. Enrollment growth is expected to be robust as a result of prioritizing expansion of the West campus, the unique niche filled by this school, and new degree programs catalyzed by the concerted organization of forensics.

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### Request to Establish a New Academic Organizational Unit

University: Arizona State University

<b>Name of Organizational Unit:</b>  School of Integrated Engineering
<b>Academic Department:</b> <i>The name of the academic department or college in which the organizational unit will be located</i>  Ira A. Fulton Schools of Engineering
<b>Geographic Site:</b> <i>The physical site (campus, extended campus, etc.) where the organizational unit will be located</i>  West campus
<b>Proposed Inception Term:</b> <i>The term and year in which the new organizational unit will begin operating</i>  Fall 2023
<b>Brief Description:</b> <i>A short outline of the activities that the organizational unit will perform. Please include, as applicable, a list of the degree and certificate programs that the unit will offer with estimates of the number of students served; an outline of research activities; public service and other significant activities.</i>  ASU requests the creation of the School of Integrated Engineering, within the Ira A. Fulton Schools of Engineering. It is anticipated that this interdisciplinary school will advance our charter mission to assume fundamental responsibility for the economic, social, cultural and overall health of the communities we serve by providing crucial opportunities in engineering and technology for students in the underserved West Valley. The school will work closely with other units to offer flexible STEM degree programs that integrate an engineering mindset and fundamental engineering principles and skills with specialized coursework in other disciplines to produce graduates who will develop innovative solutions to the most demanding, modern problems facing our society.  The new school will initially house the BS in Engineering Science approved by ABOR last year. The BS in Engineering Science is a flexible, multidisciplinary degree that integrates a broad foundation in math, science and engineering across traditional disciplines with a specialization in a chosen engineering concentration. Graduates will be prepared for careers in engineering or science as well as business professions that interface with technical specialists.

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West Valley schools, organizations and companies will also benefit from the Fulton Difference Programs, including engineering projects in community service, student organizations, K-12 programs and the Grand Challenge Scholars program available at the new school.

### **Reason for Establishing the Organizational Unit:**

*Please briefly explain why the organizational unit is being created:*

The new school is being created to serve as the home of a portfolio of degree offerings enabling students to combine an engineering mindset and skillset with other disciplines. The rationale for placing this new school on the West campus includes:

- contributing to enrollment goals at the West campus through the addition of engineering programs
- broadening access to the Fulton Schools of Engineering in the West Valley
- working towards balance in Fulton Schools of Engineering enrollments across campuses by offering new campus-specific options for students
- exploring creative ways to add teaching capacity through partnership
- developing and delivering innovative programs that expand learner options by leveraging West campus partnerships

### **Resources**

*Please provide information about the personnel and infrastructure required to create this new unit, and an estimate of the costs associated.*

Current faculty in the Fulton Schools of Engineering in relevant academic areas will be given a choice to join the new School of Integrated Engineering. No current faculty in the Fulton Schools of Engineering will be reassigned to the new school as part of its launch. Selected support staff will be assigned to the new school to meet administrative needs. Additional faculty needs will be determined in consultation with the provost. While no special equipment, materials or supplies are initially needed, investments in new equipment to support integrated engineering will be made, supported by enrollment growth.

## EXECUTIVE SUMMARY

### Request to Establish a New Academic Organizational Unit

University: Arizona State University

<b>Name of Organizational Unit:</b>  School of Counseling and Counseling Psychology
<b>Academic Department:</b> <i>The name of the academic department or college in which the organizational unit will be located</i>  College of Integrative Sciences and Arts
<b>Geographic Site:</b> <i>The physical site (campus, extended campus, etc.) where the organizational unit will be located</i>  Polytechnic campus – This school will also continue to serve Tempe, Downtown, online and other ASU campuses.
<b>Proposed Inception Term:</b> <i>The term and year in which the new organizational unit will begin operating</i>  Fall 2023
<b>Brief Description:</b> <i>A short outline of the activities that the organizational unit will perform. Please include, as applicable, a list of the degree and certificate programs that the unit will offer with estimates of the number of students served; an outline of research activities; public service and other significant activities.</i>  The School of Counseling and Counseling Psychology will focus on the education and training of counselors and psychologists to become culturally competent to work with a diverse clientele in a variety of mental health settings. The school will continue offering our students, particularly in the East Valley, the training required to prevent or treat psychological problems and to promote the health of individuals, families, groups, and organizations in a multicultural and diverse society. The School of Counseling and Counseling Psychology will house the following existing undergraduate and graduate academic programs:  <ol style="list-style-type: none"><li>1. Counseling and Applied Psychological Science, BS</li><li>2. Psychology, BA and BS</li><li>3. Master of Counseling</li><li>4. Counseling Psychology, PhD</li></ol> At present, these programs serve in excess of 800 undergraduate students and 120 graduate students.  The creation of the school will allow us to expand in new areas leveraging place and expertise. Potential new offerings in counseling and counseling psychology programs include

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military and veterans' services, bilingual and bicultural, K-12 school counseling (with City of Mesa Public Schools), neurodiversity, first responders and de-escalation, sports and performance counseling, and substance abuse and addictions. This school will be critical to expanding career pathways in the East Valley.

Expansion in these community-relevant areas is a key part of ASU's strategy for growth of the Polytechnic campus and an essential part of fulfilling our charter obligations.

### **Reason for Establishing the Organizational Unit:**

*Please briefly explain why the organizational unit is being created:*

Creation of this school is part of a broader restructuring of academic programs within the College of Integrative Sciences and Arts to achieve college and university goals in the East Valley. These goals include:

1. leverage the College of Integrative Sciences and Arts within ASU's ecosystem by building on existing strengths and enhancing the distinction among ASU's arts and sciences colleges
2. grow unique assets to create national, interdisciplinary hubs of scholarship and service at the Polytechnic campus
3. strengthen internal culture around shared purpose and unify faculty across campuses while maintaining and growing the Polytechnic campus
4. increase efficiency in unit management and align internal structure with other ASU colleges

### **Resources**

*Please provide information about the personnel and infrastructure required to create this new unit, and an estimate of the costs associated.*

Creation of this school is an essential piece of ASU's strategy for growth of the Polytechnic campus. The school will be launched with existing, successful academic programs, and the renewed focus in this area is expected to attract enrollment growth. Resources to grow the school will be supported by student enrollment and the reallocation of existing resources. Investments will include support for a school director and faculty growth in community-relevant programs.

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### Request to Establish a New Academic Organizational Unit

University: Arizona State University

<b>Name of Organizational Unit:</b>  School of Applied Professional Studies
<b>Academic Department:</b> <i>The name of the academic department or college in which the organizational unit will be located</i>  College of Integrative Sciences and Arts
<b>Geographic Site:</b> <i>The physical site (campus, extended campus, etc.) where the organizational unit will be located</i>  Polytechnic campus – This school will also continue to serve Tempe, Downtown, online and other ASU campuses.
<b>Proposed Inception Term:</b> <i>The term and year in which the new organizational unit will begin operating</i>  Fall 2023
<b>Brief Description:</b> <i>A short outline of the activities that the organizational unit will perform. Please include, as applicable, a list of the degree and certificate programs that the unit will offer with estimates of the number of students served; an outline of research activities; public service and other significant activities.</i>  The School of Applied Professional Studies will focus on areas of opportunity to give students a critical advantage with employers, focusing on skills, competencies, and credentials grounded in sciences and arts and connected to industries and advanced manufacturing. By providing students with experiential and career-related learning, the School of Professional Studies aims to prepare them for success in their careers and enrich their communities. The school will serve the following existing programs:  <ol style="list-style-type: none"><li>1. Project Management (BS and MPM)</li><li>2. Organizational Leadership (BA and MS)</li><li>3. Technical Communication (BS and MS)</li><li>4. Applied Science (BAS)</li></ol> At present, these programs serve more than 2,225 undergraduate students and 75 graduate students.  The school will also house a portfolio of certificates that includes Organizational Leadership, Peace Corps Prep and Technical Communication.

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As part of expansion of the Polytechnic campus, the school will also collaborate with the Ira A. Fulton Schools of Engineering to develop innovative programs that match engineering with professional preparation in sciences and arts. These programs will be designed to be relevant for working professional and non-traditional students.

### **Reason for Establishing the Organizational Unit:**

*Please briefly explain why the organizational unit is being created:*

Creation of this school will unify three academic programs: 1) Organizational Leadership, 2) Project Management, and 3) Technical Communication into one school serving two campuses and digital immersion. Under one umbrella, these related professional programs will be better positioned to build connections with the Ira A. Fulton Schools of Engineering, especially at the Polytechnic campus. The school will also become the hub for the College of Integrative Arts and Sciences' focus on career-connected learning outcomes, creating community for students seeking professionally grounded training in the sciences and arts.

Creation of this school is also part of a broader restructuring of academic programs within the College of Integrative Sciences and Arts to achieve college and university goals in the East Valley. These goals include:

1. leverage the College of Integrative Sciences and Arts within ASU's ecosystem by building on existing strengths and enhancing the distinction among ASU's arts and sciences colleges
2. grow unique assets to create national, interdisciplinary hubs of scholarship and service at the Polytechnic campus
3. strengthen internal culture around shared purpose and unify faculty across campuses while maintaining and growing the Polytechnic campus
4. increase efficiency in unit management and align internal structure with other ASU colleges

### **Resources**

Please provide information about the personnel and infrastructure required to create this new unit, and an estimate of the costs associated.

Creation of this school is an essential piece of ASU's strategy for growth of the Polytechnic campus. The school will be launched with existing, successful academic programs, and the renewed focus in this area is expected to attract enrollment growth. Resources to grow the school will be supported by student enrollment and the reallocation of existing resources. Investments will include support for a national search for a school director.

## EXECUTIVE SUMMARY

### Request to Establish a New Academic Organizational Unit

University: Arizona State University

<b>Name of Organizational Unit:</b>  School of Applied Sciences and Arts
<b>Academic Department:</b> <i>The name of the academic department or college in which the organizational unit will be located</i>  College of Integrative Sciences and Arts
<b>Geographic Site:</b> <i>The physical site (campus, extended campus, etc.) where the organizational unit will be located</i>  Polytechnic campus – This school will also continue to serve Tempe, Downtown, online and other ASU campuses.
<b>Proposed Inception Term:</b> <i>The term and year in which the new organizational unit will begin operating</i>  Fall 2023
<b>Brief Description:</b> <i>A short outline of the activities that the organizational unit will perform. Please include, as applicable, a list of the degree and certificate programs that the unit will offer with estimates of the number of students served; an outline of research activities; public service and other significant activities.</i>  The School of Applied Sciences and Arts brings together the values and experiences of liberal arts education with the scale and success of a national service university. As a result, it will meet the pressing need for a high-impact, holistic educational model that trains well-rounded and workforce-ready graduates. As part of its mission, the school aims to integrate liberal arts education, transferrable skills, habits of mind for lifelong learning, inquiry-based learning, and multidisciplinary instruction.  The school will house the following current undergraduate programs:  <ol style="list-style-type: none"><li>1. Applied Biological Sciences, BS [6 concentrations]*</li><li>2. Applied Mathematics, BS</li><li>3. Applied Physics, BS</li><li>4. Applied Quantitative Science, BS</li><li>5. Communication, BA</li><li>6. English, BA</li><li>7. General Studies, BA</li><li>8. History, BA</li></ol>



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9. History of Science, Technology and Innovation, BA
10. Integrative Social Science, BS
11. Interdisciplinary Studies, BA
12. Liberal Studies, BA
13. Military Studies, AA
14. Political Science, BS
15. Science Technology and Society, BS

\*The Applied Biological Sciences program has six concentrations areas that include applied biological sciences, nature resource ecology, pre-dental, pre-veterinary medicine, secondary education in biology and sustainable horticulture.

The school will also include the following current graduate programs:

1. Applied Biological Sciences, MS
2. Integrative Social Science, MS
3. Liberal Studies, MLSt
4. Narrative Studies, MA

Collectively, these programs serve more than 4,200 undergraduate students and 75 graduate students. In parallel with its distinctive degree offerings, the School of Applied Sciences and Arts will offer general studies courses across multiple campuses and online. These will include such areas as philosophy, religion, Spanish, English composition, science, math, and social science.

The college will collaborate with the Ira A. Fulton Schools of Engineering for interdisciplinary joint degrees and dual majors integrating liberal arts with engineering (for example a degree in applied humanities and engineering.)

### **Reason for Establishing the Organizational Unit:**

*Please briefly explain why the organizational unit is being created:*

Establishing the School of Applied Sciences and Arts will help realize the full potential of the College of Integrative Sciences and Arts and advance ASU's goals for expansion of the Polytechnic campus. The new school will be an administrative hub for training in applied sciences and arts, supporting robust partnerships with other colleges and degrees at the Polytechnic campus including the Ira A. Fulton Schools of Engineering, the Mary Lou Fulton Teacher's College, and the W. P. Carey School of Business.

Creation of this school is part of a broader restructuring of academic programs within the College of Integrative Sciences and Arts to achieve college and university goals in the East Valley. These goals include:

1. leverage the College of Integrative Sciences and Arts within ASU's ecosystem by building on existing strengths and enhancing the distinction among ASU's arts and sciences colleges
2. grow unique assets to create national, interdisciplinary hubs of scholarship and service at the Polytechnic campus

## EXECUTIVE SUMMARY

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3. strengthen internal culture around shared purpose and unify faculty across campuses while maintaining and growing the Polytechnic campus
4. increase efficiency in unit management and align internal structure with other ASU colleges

### **Resources**

Please provide information about the personnel and infrastructure required to create this new unit, and an estimate of the costs associated.

This new school will require a school director. The additional resources will be supported by student enrollment and the reallocation of existing resources. Enrollment growth is expected to be robust as a result of prioritizing expansion of the Polytechnic campus.

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## EXECUTIVE SUMMARY

**Item Name:** Request for New Academic Programs for Arizona State University

☒ Action Item

**Requested Action:** Arizona State University asks the board to approve its new academic program requests effective in the 2023-2024 catalog year.

### Background/History of Previous Board Action

As provided in the board policy, new academic program requests may be submitted throughout the year with the approval of the Academic Affairs and Educational Attainment Committee.

### Discussion

Arizona State University is requesting the following new academic programs for implementation in the 2023-2024 Academic Year:

- BS in Robotics and Autonomous Systems
- BA in Applied Military and Veterans Studies
- BS in Project Management
- BS in Innovation in Global Development
- BAE in Middle Grades Education
- BS in International Relations
- BA in International Relations
- BS in Earth and Environmental Sciences
- BA in Entrepreneurial Leadership
- PhD in Biostatistics
- PhD in Robotics and Autonomous Systems
- DEng in Engineering
- DIT in Information Technology
- MS in Clean Energy Systems
- MS in Indigenous Placekeeping and Design
- MA in Education for Sustainability and Global Futures
- MS in Applied Computing
- MS in Neuroscience

Degree planning at ASU is founded on the Charter: ASU is a comprehensive public

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research university, measured not by whom it excludes, but 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.

All academic degree programs go through multiple review and approval processes to ensure their currency, quality, and relevance. Each year, the Provost initiates the academic planning process. The academic deans, in consultation with the directors of the academic units, submit information on all proposed new degrees, concentrations, minors, and certificates for the ensuing year, as well as changes to existing degree titles, program disestablishments, and creation of new organizations, organizational changes and disestablishments. Once reviewed and approved by the Provost, these initiatives begin the review process, including, as applicable, the curriculum committees in the academic unit, college, Graduate College, and University Senate. At each level, a substantive review of the proposed program is completed to ensure quality and to avoid redundancy with other programs. At any step in the approval process, programs can be tabled and/or returned to the academic unit for further clarification and/or revision. The Provost reviews all resources involved in program development, both in the college offering the degree program and other colleges offering supporting courses. The distribution of the institution's resources, including faculty, infrastructure, administration and support staff, are reviewed to optimize and maximize capacity. In addition, the university invests annually in academic units based on enrollment growth, allowing academic units to expand capacity, with the additional funds invested in strategic hiring. The academic units also receive increasing revenue from summer and online operations which provides resources for the initiatives.

The proposed undergraduate degrees will train students in applied entrepreneurship, earth and environmental sciences, the complexity of international relations and how to take an innovative approach to the world's global development problems; how to teach middle schoolers and how to work with and provide services to military servicemembers and veterans. Students will have opportunities to learn project management strategies applicable to many careers and workplaces or the fundamentals of the high demand field of robotics and autonomous systems.

The proposed graduate degree programs will provide advanced training in important STEM fields including applied computing, biostatistics, robotics, engineering, information technology, clean energy systems and neuroscience, as well as innovative study in cultural areas in the cross-section of design and indigenous studies, and education through the lens of sustainability and the natural environment.

In keeping with the 2021 Operational and Financial Review Enterprise Plan, the degree proposals are aligned strategically with our design aspirations to leverage our place, transform society, value entrepreneurship, include use-inspired research, enable student

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success, fuse intellectual disciplines, be socially embedded, and engage students with issues locally, nationally and internationally.

### **Committee Review and Recommendation**

The Academic Affairs and Educational Attainment Committee reviewed this item at its January 26, 2023 meeting and recommended forwarding the item to the full board for approval.

### **Statutory/Policy Requirements**

ABOR Policy 2-223 “Academic Locations, Degree Programs and Organizational Units”

**EXECUTIVE SUMMARY**

**Academic Plan 2023-2024 Requested Degree Programs**

<b>Undergraduate Degrees</b>	<b>College</b>
<a href="#"><u>BS in Robotics and Autonomous Systems</u></a>	Ira A. Fulton Schools of Engineering
<a href="#"><u>BA in Applied Military and Veterans Studies</u></a>	College of Integrative Sciences and Arts
<a href="#"><u>BS in Project Management</u></a>	College of Integrative Sciences and Arts
<a href="#"><u>BS in Innovation in Global Development</u></a>	College of Global Futures
<a href="#"><u>BAE in Middle Grades Education</u></a>	Mary Lou Fulton Teachers College
<a href="#"><u>BS in International Relations</u></a>	The College of Liberal Arts and Sciences
<a href="#"><u>BA in International Relations</u></a>	The College of Liberal Arts and Sciences
<a href="#"><u>BS in Earth and Environmental Sciences</u></a>	The College of Liberal Arts and Sciences
<a href="#"><u>BA in Entrepreneurial Leadership</u></a>	W. P. Carey School of Business
<b>Graduate Degrees</b>	<b>College</b>
<a href="#"><u>PhD in Biostatistics</u></a>	College of Health Solutions
<a href="#"><u>PhD in Robotics and Autonomous Systems</u></a>	Ira A. Fulton Schools of Engineering
<a href="#"><u>DEng in Engineering</u></a>	Ira A. Fulton Schools of Engineering
<a href="#"><u>DIT in Information Technology</u></a>	Ira A. Fulton Schools of Engineering
<a href="#"><u>MS in Clean Energy Systems</u></a>	Ira A. Fulton Schools of Engineering
<a href="#"><u>MS in Indigenous Placekeeping and Design</u></a>	Herberger Institute for Design and the Arts
<a href="#"><u>MA in Education for Sustainability and Global Futures</u></a>	Mary Lou Fulton Teachers College
<a href="#"><u>MS in Applied Computing</u></a>	New College of Interdisciplinary Arts and Sciences
<a href="#"><u>MS in Neuroscience</u></a>	The College of Liberal Arts and Sciences

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### Request to Establish New Academic Program in Arizona

University: Arizona State University

<b>Name of Proposed Academic Program:</b>  BS in Robotics and Autonomous Systems
<b>Academic Department:</b>  Ira A. Fulton Schools of Engineering  <i>School of Manufacturing Systems and Networks</i>
<b>Geographic Site:</b>  Polytechnic, Tempe, West and Downtown campus
<b>Instructional Modality:</b>  Immersion and online
<b>Total Credit Hours:</b>  120
<b>Proposed Inception Term:</b>  2023
<b>Brief Program Description:</b>  The objective of the BS in Robotics and Autonomous Systems is to prepare students to fulfill the growing demand for entry-level positions and pursue careers in robotics and autonomous systems. Specifically, students will learn to design, control, operate and maintain robots, while understanding their use within the context of industrial robotics, autonomous aerial vehicles and swarm robotics. Topics of study will include fundamentals of robotics, robot control theory, human-robot interaction and collaboration, probabilistic robotics, and introduction to computing, sensors and actuators. The focus will be on fusing intellectual disciplines, industrial applications, and robots for improving quality of life and work. Some of the relevant current courses include Computational Modelling of Engineering Systems, Embedded Systems Design Project, Robotics 1 and 2. This program will combine knowledge from various engineering disciplines and train students to work in the industry pursuing use-inspired research that is socially embedded and impactful. This type of technical and multidisciplinary workforce is critical for attracting and helping to grow industries in the Southwestern U.S. Project-based, hands-on learning will be a significant feature of the program. At the time of graduation, students will have constructed and operated robots of various types, and they will understand how to apply that to solve real-world engineering



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problems across a wide industry base.

**Learning Outcomes and Assessment Plan:**

**Learning Outcome 1:** Students should have the ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science and mathematics.

- **Concepts:** physics and mathematics, rotation matrices, vector mechanics, Newton's laws, Lagrangian equations, control systems, kinematics, dynamics, robotics and autonomous systems.
- **Competencies:** Students will be able to solve problems of kinematics and dynamics of robots using rotation matrices, vector mechanics and Newton's laws. Students will be able to use Lagrangian equations of motion and conservation laws in continuous and discrete time, and work with properties of metals and nonmetals to design robots. Students will have the training and skills to analyze and design control systems, and combine the different multiphysics methods in the analysis and design of complex systems.
- **Assessment Methods:** Specific to outcome one, the process begins by collecting data from the two-semester Senior Design (capstone project) sequence, Question "e" in the second course and a similar metric in technical electives (4xx) and pathways (3xx) courses. The student artifacts are scored using a faculty-designed rubric. Data are compiled and shared with program faculty and an external advisory board. Assessment outcome one was designed to integrate many of the skills that the students should have while being abstract enough to encompass the different possible specialization areas. The rubric evaluation for each student is completed based on each student's project reports, presentations, performance and peer evaluations. The second measure is the assessment of a similar metric in technical electives (4xx) and pathway (3xx) courses to provide information on the class's progress through the curriculum. The third measure is the BS robotics and autonomous systems exit survey that is deployed to graduating students each term by the program chair. Data are reviewed by faculty and an external advisory board. Results and analysis are used for the continuous improvement of the curriculum.
- **Measures:** Comprehensive design documentation will be generated that captures the students' ability to identify and formulate problem solutions. Rubrics will be utilized to assess student competencies and identify areas for program improvement.

**Learning Outcome 2:** Students will apply engineering design to produce solutions that meet specified needs with consideration of public health, safety and welfare, as well as global, cultural, social, environmental and economic factors

- **Concepts:** critical thinking and problem-solving skills, public health, safety, and welfare; global, cultural, social, environmental, and economic factors; principles in engineering science, computational modeling, programming, dynamical systems, mechanics, robot control, automation, perception and machine learning

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- **Competencies:** Students will be able to visualize and extrapolate how technical specifications can be translated into engineering specifications to constrain solutions to design problems, as well as develop and use mathematical models to predict the behavior of robotic and industrial automation systems under different circumstances. Students will be able to create novel or improved solutions to practical problems.
- **Assessment Methods:** Data is collected by scoring student artifacts using a faculty-developed rubric. Artifacts in the two-semester Senior Design (capstone project) course. Question "h" in the second course, which is typically an exit course. The second measure is the assessment of a similar metric in technical electives (4xx) and pathways (3xx) courses using the industry rubrics. Question "h" in technical electives and pathways to provide information on the progress of the class as they move through the curriculum. Two years of data are collected and then analyzed. A rubric is used to evaluate each student based on their project reports, presentations, performance and peer evaluations. Results and final analysis are used for continuous curricular improvement.
- **Measures:** Comprehensive design documentation will be generated that captures the students' ability to identify and formulate problem solutions. Industry rubrics will be utilized to assess student competencies and identify areas for program improvements.

**Learning Outcome 3:** Students will have the ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

- **Concepts:** research process, principles in physics and engineering like Newton's Laws, data collection and statistical quantitative analysis, and computer systems like MATLAB
- **Competencies:** Graduates should be able to set up experiments by understanding the physical principles; use sensors and electronics to measure physical quantities; use the computer for high-quality data collection; understand the industrial applications of robotics; use algorithms for data analysis, interpretation and machine learning.
- **Assessment Methods:** Data is collected by scoring student artifacts using a faculty-developed rubric. Artifacts in the two-semester Senior Design (capstone project) Question "b," which is typically an exit course. The second measure is the assessment of a similar metric in technical electives (4xx) and pathways (3xx) courses using the industry rubrics. Question "b" in technical electives and pathways to provide information on the progress of the class as they move through the curriculum. Two years of data are collected and then analyzed. A rubric is used to evaluate each student based on their project reports, presentations, performance, and peer evaluations. Data are reviewed by faculty and an external advisory board. Results and final analysis are used for the continuous curricular improvement.
- **Measures:** Rubrics will be utilized to assess student competencies and identify areas for program improvements.

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### Projected Enrollment for the First Three Years:

Year 1: 50  
Year 2: 100  
Year 3: 300

### Evidence of Market Demand:

Robotics jobs are in high demand. The U.S. Bureau of Labor Statistics estimates that robotics engineering jobs will grow by 30% in the next decade, and that the median income for the area is \$104,000. The lowest-earning 10% of roboticists earned less than \$62,000, and the highest-earning 10% earned more than \$198,000. The Phoenix area is one of the top five areas for employment in robotics, with a mean salary of \$115,000. With major robotics and automation industries expanding their presence in Arizona, graduates should be able to find positions in the valley and contribute to the Industry 4.0 revolution. Graduates can work in autonomous ground vehicles-driverless cars, aerial vehicles-commercial, military drones, space robotics, semiconductor manufacturing, and factory automation. They can work as automation engineers, autonomous vehicle design engineers, design engineers, or factory automation engineers. Manufacturing makes up 18% of all robotics jobs available in the country. Post-pandemic disruptions in labor markets and labor shortages have accelerated the growth of the use of robots within the industrial environment. This trend is only going to grow with advancements made in hardware and software technologies that power these robots.

[1] <https://www.onetonline.org/link/summary/17-2199.08>

[2] 2022 Trends from Robots. Jobs Shows Dramatic Growth in Robotics and Artificial Intelligence Career Opportunities (automation.com)

[3] Learn About Robotics Engineering | Indeed.com

[4] Robotics Engineer Demographics and Statistics [2022]: Number of Robotics Engineers in The US (zipia.com)

### Similar Programs Offered at Arizona Public Universities:

There are no similar programs at the bachelor's level at any Arizona public university. ASU offers a graduate degree program in Robotics and Autonomous Systems, which has seen explosive growth in the past two years. A similar trend is expected at the bachelor's level. Nationally, Worcester Polytechnic Institute (WPI) started its program in 2020, and just in the first two years of operation, its enrollment numbers stand at around 300-400 students.

### Objection(s) Raised by Another Arizona Public University? YES NO

Has another Arizona public university lodged a written objection to the proposed program with the proposing university and the Board of Regents within seven days of receiving notice of the proposed program?

### If Yes, Response to Objections:

Please provide details of how the proposing university has addressed the objection. If the objection remains unresolved, please explain why it is in the best interests of the university system and the state that the Board override it.

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**New Resources Required? (i.e. faculty and administrative positions; infrastructure, etc.):**

Internal resources already allocated to the Ira A. Fulton Schools of Engineering will be reallocated to launch this program, and student enrollment will support growth.

**Plan to Request Program Fee/Differentiated Tuition?**                      **YES**    **NO**

**Estimated Amount:** \$540 per semester

**Program Fee Justification:** Students will be assessed the tier-four college fee.

**Specialized Accreditation?**                      **YES**    **NO**

**Accreditor:** None

## EXECUTIVE SUMMARY

### Request to Establish New Academic Program in Arizona

University: Arizona State University

<b>Name of Proposed Academic Program:</b>  BA in Applied Military and Veterans Studies
<b>Academic Department:</b>  College of Integrative Sciences and Arts
<b>Geographic Site:</b>  Downtown Phoenix, Polytechnic, Tempe, West campus
<b>Instructional Modality:</b>  Immersion and Online
<b>Total Credit Hours:</b>  120
<b>Proposed Inception Term:</b>  2023
<b>Brief Program Description:</b>  <p>The BA in Applied Military and Veterans Studies prepares students for careers in military-and-veteran-serving industries, community organizations and public service. Military and veterans' studies are emerging academic fields that enable students to deepen their understanding of service by exploring multidisciplinary aspects of military service and the implications for veterans and society. The degree will offer an interdisciplinary approach to understanding U.S. military history, the national security ecosystem, international relations and the political system, as well as representations, experiences, and culture relevant to military service, veterans, and their transition into civilian life. Aligned with the mission of the College of Integrative Sciences and Arts, the core of the major integrates an applied approach which will offer opportunities in service learning, community engagement and research.</p> <p>The College of Integrative Sciences and Arts is uniquely positioned to house this degree as the college is also home to the Office for Veteran and Military Academic Engagement, ongoing partnerships with the U.S. Naval Community College, the undergraduate Certificate in Veterans, Society and Service, and unique courses that recognize military-affiliated students as individuals who acquired expertise in leadership and in their military occupational specialties.</p>

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Nationally, academic programs that provide an awareness and understanding of military and veteran cultures are scarce. With over 10,500 military-affiliated students, millions invested in defense-related research and the Pat Tillman Veterans Center, ASU is committed to our service members, veterans and their families.

The Polytechnic campus will be the perfect location to house this degree. The campus is located at a former training facility for the United States Army Air Corps (1941-47) and Air Force (1947-93). The transition of a strategic military space into an educational institution for applied knowledge and experiential learning is emblematic of what this program sets out to accomplish. This program extends ASU's national brand as a top military and veteran-friendly institution.

**Learning Outcomes and Assessment Plan:**

**Learning Outcome 1:** Students will be able to assess the military-civilian divide.

- **Concepts:** military culture, civilian culture, veteran culture, service, post-service, war generations, peacetime, wartime, civilian life, cultural history
- **Competencies:** Students will be able to outline a critical understanding of military and veteran cultures that integrates the role of gender, race, and socio-economic differences in recruitment, selective service, wartime effectiveness, and the military-civilian divide.
- **Assessment Methods:** Students will produce weekly essays in which they are expected to observe, explore, and problematize assigned cultural/media texts that revolve around military and veteran culture, communities and identities, and assess the military-civilian divide. Students are expected to use concepts and theories discussed in each module. A standardized rubric considering organization, connection to readings, personal insight, and grammar and mechanics will be used to evaluate the essays. Scores on the rubric will be collected for assessment purposes.

In addition, students will receive scores using a set scale of criteria from zero to 100%. Artifacts include articles, posting comments, participating in polls, and engaging in meaningful debates concerning learning modules.

Data will be shared with the college's curriculum and assessment committee after the session ends. These committees, composed of faculty, academic advisors, and students, will ensure that the assessment findings will be used for continuous improvement of course curriculum and delivery.

- **Measures:** Weekly essays will be evaluated by instructors according to a rubric based on the following criteria: organization, connection to readings, personal insight, and grammar and mechanics. Seventy percent of participating students will receive 70% or more on the weekly essays. To complement and assess engagement with the material, students will participate in online debates, expecting that 70% will receive 80% or more on the assessment scale.

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**Learning Outcome 2:** Students will be able to apply critical analysis, organization, and purpose in a writing project.

- **Concepts:** critical thinking, foundations of writing, mechanics of writing, written communication: audience, purpose, genre
- **Competencies:** Students will have the ability to write effectively with a clear and logical structure, demonstrate organization in their writing, and will be able to write to appropriate audiences.
- **Assessment Methods:** In the 300-level capstone course, students' capstone course, a final written project will be scored by the faculty teaching the course using a common rubric. The writing project will involve sustained writing engagement. A standardized, score-based rubric will be employed considering context and purpose for writing, content development, conventions of organization, and adherence to conventions of syntax and mechanics.
- **Measures:** Scores on the rubric will be aggregated for assessment purposes. Data will be shared with the college's curriculum and assessment committee after the session ends. These committees, composed of faculty, academic advisors, and students, will ensure that the assessment findings will be used for continuous improvement of course curriculum and delivery. Eighty percent of students will "meet expectation" or exceed on a faculty-developed rubric. The results and the findings of the curriculum and assessment committee will be used to refine the program.

**Learning Outcome 3:** Students will develop research questions and conduct literature reviews on military/veteran studies.

- **Concepts:** research questions, primary sources, secondary sources, quantitative research, qualitative research, research design, focus groups, ethnographies, literature review, online ethnography, surveys, annotated bibliography
- **Competencies:** Students will be able to find and collect appropriate sources related to research questions, develop or refine their historical and analytical writing skills, demonstrate their ability to assess websites for valid, reliable information, and integrate research ethics guiding principles.
- **Assessment Methods:** In a 400-level AMV course, students will be assessed using a score-based rubric, on their ability to write research questions and produce a literature review. Students will also complete an exit survey – Graduating Student Report Card – to evaluate the ethical guiding principles in research. Scores and data obtained from both the rubric and survey will be aggregated for assessment purposes.

Data will be shared with the college's curriculum and assessment committee. These committees, composed of faculty, academic advisors, and students, will ensure that the assessment findings will be used for continuous improvement of course curriculum and delivery.

- **Measures:** Eighty percent of students will meet or exceed expectations on all dimensions of the rubric. Data will be pulled from the exit survey to assess how well

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students felt ASU prepared them with skills in understanding ethical standards in research. At least 80 percent of the surveyed graduating students will answer this question as 'very much' or 'quite a bit.' The results and the findings of the curriculum and assessment committee will be used to refine the program.

### **Projected Enrollment for the First Three Years:**

Year 1: 10  
Year 2: 20  
Year 3: 30

### **Evidence of Market Demand:**

Throughout our nation's history, more than 41 million Americans have served in the armed services. According to the U.S. Department of Veterans Affairs National Center for Veterans Analysis and Statistics' Veterans Population Model (VetPop2018) projections, roughly 18 million are living military veterans, post-9/11 veterans are distinctive. With a median age of 37 years, they are among the youngest cohort of veterans. They are the veterans most likely to be engaged in the labor force. Among those who were not working, post-9/11 veterans are more likely than nonveterans to be enrolled in higher education (32 percent compared with 26.4 percent) and to have worked in the last 12 months (Gumber and Vespa 2020). Veterans today include women and men who are transitioning to second careers after separation from service. According to VetPop2018, over 2.3 of all 18 million U.S. military veterans live in Arizona and California alone.

This program responds to the growing demand for individuals with the skills (soft and transferable) needed for careers in military and veteran-serving industries, public and government service and community organizations. These skills are teamwork and leadership, critical thinking and problem solving, cross functional and transparent communication, endurance, strength and resiliency, strong work ethic, adaptability, and a holistic understanding of diversity and inclusion (Citröen, 2022).

This program will attract the following learners:

- Military service members seeking next steps within or post-military career. Learner may need additional training, credentials and degree pathway to thrive.
- Students seeking to work in military/veteran service organizations.
- Students seeking specialization in the emerging field of military/veteran studies.

Graduates from the program may benefit enormously from the demand for employees with federal agencies. For example, just the Department of Defense, employs over 950,000 civilians, many serving in critical positions worldwide. Similarly, the Department of Veterans Affairs employs almost 400,000 individuals around the U.S. In 2021 alone, there were close to 4,000,000 government job postings per month across the U.S. with 112,000 of these job postings per month located in the state of Arizona. The national average for this area is 75,053 postings per month, which puts the Arizona posting activity above average. Over the



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next five years, the Arizona government sector is projected to increase by 5.7%, and on average, these employees earn an average salary of \$84,092 (EMSI 2022).

Data from the Bureau of Labor Statistics suggests that jobs like operations manager that rely on leadership, teamwork, communication skills, and critical thinking skills are expected to grow 13% by 2027. These jobs earn a median salary of \$103,163 annually. It is estimated that there are over ten-thousand nonprofit organizations around the U.S. dedicated exclusively to support of military-connected individuals and veterans (Sloan, 2022). EMSI data projects a growth for these types of positions of 23.5% through 2027.

Retrieved from: <https://www.defense.gov/Help-Center/Article/Article/2742213/departments-of-defense-civilian-employment-opportunities/>

Retrieved from: <https://www.military.com/veteran-jobs/career-advice/military-transition/nonprofit-organization-for-veterans.html>

**Similar Programs Offered at Arizona Public Universities:**

NAU has a Minor in Military Leadership, but none of the state universities offer a degree in military or veteran studies. ASU offers the AA in Military Studies in partnership with the U.S. Naval Community College.

**Objection(s) Raised by Another Arizona Public University? YES NO**

Has another Arizona public university lodged a written objection to the proposed program with the proposing university and the Board of Regents within seven days of receiving notice of the proposed program?

**If Yes, Response to Objections:**

Please provide details of how the proposing university has addressed the objection. If the objection remains unresolved, please explain why it is in the best interests of the university system and the state that the Board override it.

**New Resources Required? (i.e. faculty and administrative positions; infrastructure, etc.):**

No additional state resources will be required, as resources from existing funding will be reallocated.

**Plan to Request Program Fee/Differentiated Tuition? YES NO**

**Estimated Amount:** N/A

**Program Fee Justification:** N/A

**Specialized Accreditation? YES NO**

**Accreditor:** None

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### Request to Establish New Academic Program in Arizona

University: Arizona State University

<b>Name of Proposed Academic Program:</b>  BS in Project Management
<b>Academic Department:</b>  College of Integrative Sciences and Arts
<b>Geographic Site:</b>  Polytechnic, Tempe, Downtown and West campus
<b>Instructional Modality:</b>  Immersion and online
<b>Total Credit Hours:</b>  120
<b>Proposed Inception Term:</b>  2023
<b>Brief Program Description:</b>  <p>The BS in Project Management is a degree grounded in the high-demand field of project management, which has applications across a wide range of industries, both locally and globally. This program features a curriculum based on the latest project management theories and practices and provides opportunities for students to apply these practices in real-world situations through simulations.</p> <p>The College of Integrative Sciences and Arts currently offers a BA in organizational leadership to more than 1,400 students. It also offers a BA in organizational leadership with a concentration in project management, a minor in project management, an MS in organizational leadership and a Master of Project Management. It has a strong faculty well positioned to establish a BS degree building on existing curriculum, with valuable project management leadership, theory and skills.</p> <p>As the field of project management continues to evolve and grow, the demand for specialized programming justifies a unique degree program that can keep pace with the changing needs of the workforce. A BS in Project Management will allow students to take more courses directly focused on project management rather than the limited number currently offered as part of an organizational leadership concentration. Students will learn how to plan, implement,</p>

and tailor complex projects through project management tools and techniques related to risk, quality, time, resource, scope, cost, procurement, communication, stakeholder engagement, integration and change management. The curriculum will be developed around the internationally recognized project management principles and performance domains, preparing students for multiple career pathways. Additionally, as a Bachelor of Science this degree will require a higher degree of math and research proficiency than a Bachelor of Arts degree, as it will fill a need in training students on utilizing qualitative and quantitative research methodologies and project evaluation and assessment practices.

**Learning Outcomes and Assessment Plan:**

**Learning Outcome 1:** Students will be able to identify solutions in managing projects by applying a comprehensive body of project management knowledge.

- **Concepts:** team building, systems thinking, value assessment and adaptive thinking, integration, scope management, communication, time management, quality management
- **Competencies:** Students will be able to identify project approaches used to accommodate differing projects along the Continuum of Project Lifecycles, create a collaborative deliverable and conduct peer discussion. Students will be able to demonstrate organizational literacy by analyzing case study examples, as well as adaptive thinking by engaging in multiple project management approaches. Students will analyze internal and external factors within an organization.
- **Assessment Method:** In Approaches to Project Management, students will design a tailored project approach within an assigned real-world project. Student artifacts will be scored using a faculty-designed rubric. Data will be compiled and shared with program faculty. The rubric evaluation for each student will be done by faculty based on their project reports. The second measure is that students will demonstrate that they can critically analyze internal and external factors for organizations within a variety of contexts by responding to weekly case studies.
- **Measures:** In Approaches to Project Management, students will complete a group project. Then, in Project Strategic Analysis, students will complete multiple case study analyses. Both assignments will be assessed via a faculty-designed rubric. For each measure, at least 80% of students will earn a rating of at least "mastery" based on a faculty committee developed rubric with the following five-point scale: 1=failing 2=unsatisfactory 3=adequate 4=mastery 5=superior. These data will be reviewed by faculty. Results and analysis will be used for the continuous improvement of the curriculum.

Students will also be surveyed via the Graduating Student Report Card, a survey sent to all recent ASU graduates, to determine their ability to apply project management principles, specifically the question relating to ASU's contribution to skills in understanding ethical standards in your field. At least 80% of students will respond with a rating of highly agree or agree on the scale: 1=not at all, 2= somewhat agree, 3 = neither agree nor disagree, 4 = agree, 5 = highly agree.

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**Learning Outcome 2:** Students will demonstrate the ability to apply leadership theory to effect appropriate ethical change in a variety of project settings.

- **Concepts:** conflict management, communication, ethics, resource management, organizational theory, dispute resolution, leadership, perspective dimensions, teamwork and diversity, trait theory, behavioral theory, transactional theory, transformational theory, situational theory, philosophical egoism, utilitarianism, deontology, ethics of virtue, ethics of responsibility
- **Competencies:** Students will be able to evaluate the leadership theories used in a project management approach and identify when leadership is the cause of a project issue. Students will apply leadership and ethical consideration to a plan for resolution.
- **Assessment Methods:** In Theory and Practice of Leadership, students will apply leadership theories analyzing real-world examples to develop recommendations with supporting evidence and reasoning. Student artifacts will be scored using a faculty-designed rubric. Data will be compiled and shared with program faculty. In a second measure, students will identify how the ethical theories from the course materials were or could have been applied to case studies.
- **Measures:** In Theory and Practice of Leadership, students will complete a series of case study discussions assessed by a faculty-developed rubric. In Organizational Ethics, students will complete a series of case study papers. For each measure, at least 80% of students will earn a rating of at least "mastery" based on a faculty committee developed rubric with the following five-point scale: 1=failing 2=unsatisfactory 3=adequate 4=mastery 5=superior. Data will be reviewed by faculty. Results and analysis will be used for continuous curricular improvement.

**Learning Outcome 3:** Students will create an organizational assessment to measure the organization's overall health and performance prior to project initiation.

- **Concepts:** Weisbord's model, open systems model, Burke & Litwin model, Seven-S model, organizational intelligence model, structural frame, human resource frame, political frame, symbolic frame, organizational evaluation, analyze organizational challenges
- **Competencies:** Students will be able to identify organizational structures, understand modes of communication, motivation of organization, importance of technology, and group dynamics in organization. Students will be able to identify strengths and weaknesses of an organization.
- **Assessment Methods:** In Behavioral Dynamics in Organizations, students will identify strengths and weaknesses associated with various leadership styles by completing an assessment of leadership styles. The student artifacts will be scored using a faculty-designed rubric. Data will be compiled and shared with program faculty. In Assessment in Organizations, students will propose effective leadership interventions by assessing system dynamics in organizations through a series of case studies.

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- **Measures:** For each measure, at least 80% of students will earn a rating of at least "mastery" based on a faculty committee developed rubric with the following five-point scale: 1=failing 2=unsatisfactory 3=adequate 4=mastery 5=superior. Results and analysis will be used for continuous curricular improvement.

**Projected Enrollment for the First Three Years:**

Year 1: 75  
Year 2: 100  
Year 3: 150

**Evidence of Market Demand:**

The role of a project manager is becoming increasingly critical as companies orient more of their work in a "projected" fashion. Project managers get companies and organizations to achieve results. In many organizations, the project manager is a vital role that helps lead a company and its projects to success.

According to Emsi Analyst data on job statistics from December 2020 to January 2021, there were roughly 52,598 project management hires in the U.S. The number of qualified candidates with degrees in the field was in the mere thousands compared to the need. In addition, there is a 31% projected increase in job openings during the 2017 to 2027 time period. From January 2018 through January 2019, employers posted 372,243 jobs under Project Managers (Management) and 129,890 jobs under project managers (computer and mathematical). According to Emsi Q1 2019 data, 15,202 postings required Project Management Professional Certification and 5,404 required Project Management Institute (PMI) Certification. The top degree-granting institutions in project management in 2017 were the University of Phoenix (416 project management degrees with 18.2% growth YOY), Capella University (160 project management degrees with 13.5% growth YOY), and Colorado State University-Global Campus (133 project management degrees with 24.3% growth YOY). There is a great opportunity for a public university to leverage the expertise of internationally recognized faculty who hold project management credentials.

According to the Bureau of Labor Statistics, the median income for a project manager was \$96,000 in 2006 (<https://www.google.com/url?client=internal-element-cse&cx=013738036195919377644:6ih0hfrgl50&q=https://www.bls.gov/careeroutlook/2006/summer/art03.pdf&sa=U&ved=2ahUKEwj13fT4hozpAhXgIDQIHZ8xASoQFjAEegQIAxAB&usg=AOvVaw2kZNN5WF44ksV0QLdOq63V>).

**Similar Programs Offered at Arizona Public Universities:**

The proposed program will be unique in Arizona. The Bachelor of Science in Business Administration in Management at Northern Arizona University combines project management specifically with business, whereas the ASU program will present project management in more varied contexts. The Bachelor of Arts in Project Management at the University of Arizona does not contact comparable experience with math and data analysis to the proposed bachelor of science program.

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<b>Objection(s) Raised by Another Arizona Public University?</b>	<b>YES</b>	<b>NO</b>
Has another Arizona public university lodged a written objection to the proposed program with the proposing university and the Board of Regents within seven days of receiving notice of the proposed program?		
<b>If Yes, Response to Objections:</b> Please provide details of how the proposing university has addressed the objection. If the objection remains unresolved, please explain why it is in the best interests of the university system and the state that the Board override it.		
<b>New Resources Required? (i.e. faculty and administrative positions; infrastructure, etc.):</b>  Internal resources already allocated to the College of Integrative Sciences and Arts will be reallocated to launch this program, and student enrollment will support growth.		
<b>Plan to Request Program Fee/Differentiated Tuition?</b>	<b>YES</b>	<b>NO</b>
<b>Estimated Amount:</b> None		
<b>Program Fee Justification:</b> N/A		
<b>Specialized Accreditation?</b>	<b>YES</b>	<b>NO</b>
<b>Accreditor:</b> Accreditation will be sought from the Global Accreditation Institute of the Project Management Association.		

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### Request to Establish New Academic Program in Arizona

University: Arizona State University

<b>Name of Proposed Academic Program:</b>  BS in Innovation in Global Development
<b>Academic Department:</b>  College of Global Futures  <i>School for the Future of Innovation in Society</i>
<b>Geographic Site:</b>  Tempe, West, Downtown, Polytechnic campus
<b>Instructional Modality:</b>  Immersion and online
<b>Total Credit Hours:</b>  120
<b>Proposed Inception Term:</b>  2023
<b>Brief Program Description:</b>  <p>Innovation in global development is a dynamic and fast-growing field that sits at the intersection between conventional approaches to global development and rapid advances in innovation understanding, theory and practice. Arizona lacks an undergraduate degree in the general field of global development, and there are no online programs in the country that focus on innovation in the field. The growth of development initiatives and activities across Arizona State University and within the College of Global Futures provides the expertise and engagement possibilities for a unique undergraduate degree in innovation in global development.</p> <p>With a focus on transdisciplinarity, this degree will prepare learners from around the world to lead positive innovative change in global development at scale. By offering outcomes-driven teaching and a dynamic research environment, ASU will prepare well-equipped and deeply motivated graduates who can critically understand and address modern development challenges. The core courses and curricula combine mastery of the discipline with a focus on the acquisition of skills and competencies that enable communication, creativity, independent thinking, and the ability to work in multicultural contexts.</p>

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The curriculum will introduce students to the complexity of development challenges in the context of innovation, and will prepare them to interface effectively with key stakeholders at local, national and global levels. Guided by a framework of inclusive development, the degree's thematic focus will include innovation and development contextualized by freedom, decolonization, inequalities, sociotechnical systems, grassroots innovation, and related issues like human rights, water, energy and development, food security, global health and refugees.

The curriculum will be designed to give students research and internship opportunities that connect them to the university's global development community, through existing and future projects and initiatives across ASU and Arizona.

**Learning Outcomes and Assessment Plan:**

**Learning Outcome 1:** Students will be able to articulate concepts and practices of current global development issues, including inequality and access to resources, through oral and written communication.

- **Concepts:** global and international development; inclusive development; human development; human well-being; global development institutions; sustainable development goals; political and economic processes; development policies; critical analysis; communication
- **Competencies:** Students will be able to understand and describe current global development issues, and analyze current concepts and practices of global development. Students will have the ability to communicate these ideas to diverse audiences in oral and written communication.
- **Assessment Methods:** Students are evaluated using the final project in Global Development in the 21st Century and the final project in Alternative Perspectives in Global Development. The rubric for the assignment in Global Development in the 21<sup>st</sup> Century will assess the student's description of the main theories and their impacts on global development, as well the student's identification and evaluation of key global development institutions and associated policies. Students will provide an analysis of a selected global development challenge. They will be assessed on their use of global development terminologies and their contexts, and the professionally organized, cited and presented project.

In the final project in Alternative Perspectives in Global Development, the assignment rubric will assess the areas of performance, which will include the analysis of main alternative approaches for inclusive development; identification of significant institutions and actors and their roles in these alternative approaches; selected analysis and presentation of a relevant, real or potential problem, and a professionally presented final project. Rubrics for these assessed assignments will include a 4-point scale: 1) Information Not Present, 2) Below Expectation, 3) Meets Expectation, 4) Exceptional.

Faculty teaching these courses will gather this data from all majors. The degree program chair and/or program committee will compare average rubric scores to historical data. Sustained dips in scores will prompt faculty to examine teaching



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methods and materials.

- **Measures:** The final projects will be assessed using the assignment evaluation rubric. Seventy percent of students will achieve an average rating of at least “meets expectation” on each project. The faculty teaching these courses will gather this data from all majors. The degree program chair and/or program committee will specifically look at average rubric scores on both assessments compared to historical data. Data will be shared with faculty to be used for continuous improvement.

**Learning Outcome 2:** Students will be able to synthesize diverse and innovative approaches to achieve global development goals.

- **Concepts:** global, regional, national and local development policies and strategies; history of development projects; unintended consequences; inclusive development; innovative development policies and practices; impact of technology and development, knowledge systems
- **Competencies:** Students will be able to identify innovative strategies to achieve development goals, as well as determine roadblocks and possible opportunities for positive change. Students will synthesize these strategies to apply in a specific community.
- **Assessment Methods:** The learning outcome will be assessed in Alternative Perspectives in Global Development, where students complete a case study analysis, in the capstone paper in the 400-level IGD course, and in an exit survey. In the case study analysis, students will identify an inclusive development case study and complete a critical analysis of the case. Students will then explore the application of the case to other settings. In the assignment, students will use and evaluate related concepts, and prepare a professionally cited written paper.

In the capstone paper, students will identify a significant global development challenge and apply appropriate historical, socioeconomic and cultural background to the challenge. Students will apply a relevant theory and/or concept that addresses the development challenge and produce a well-written final paper.

Both assessments will be evaluated using a rubric ranked on a four-point scale: 1) Information Not Present, 2) Below Expectation, 3) Meets Expectation, 4) Exceptional.

Faculty teaching these courses will gather this data from all majors. The degree program chair and/or program committee will compare average rubric scores compared to historical data. Sustained dips in scores will prompt faculty to examine teaching methods and materials. Data will be shared with faculty to be used for continuous improvement.

Finally, the outcome will be assessed by an exit survey – Graduating Senior Report Card – administered by the university upon graduation. The faculty will measure the response of students to how well they were prepared for “thinking critically and analytically.”

- **Measures:** Seventy percent of students will achieve the rating of on average at least “meets expectation” on the case study rubric. On the capstone paper, 80% of students will achieve the rating of on average at least “meets expectation.” On the Exit Survey, 80% of graduates will indicate ‘very much’ as the response to their preparation for thinking critically and analytically.

**Learning Outcome 3:** Students will demonstrate the ability to evaluate sociocultural factors in their own research and analysis in the realm of global development.

- **Concepts:** diversity of socio-cultural settings; intercultural communication; cultural values and dimensions; socio-cultural structures; class and race; social mobility and social barriers
- **Competencies:** Students will demonstrate an understanding of the complexities of diverse social and cultural settings, analyze the appropriate historical, social and cultural background on the challenge being addressed in their research study, apply a relevant theory and/or concept that addresses the challenge and define possible solutions. Solutions will factor in social and cultural elements in diverse settings to contribute to positive social change.
- **Assessment Methods:** Student outcomes will be assessed via a research paper in the 100-level course. Students will write a paper describing how social and cultural factors impact development in a selected country. Students should demonstrate knowledge of how a development practitioner might navigate these scenarios.

Students will also complete a capstone paper that will require the identification of a significant global development challenge. Students will analyze the appropriate historical, social and cultural background on the challenge, apply relevant theory and/or concept that addresses this challenge and its potential outcome, and produce a well-written final paper. Students will then prepare a professional presentation of the final paper. Assignment assessment rubrics will use a 4-point scale: 1) Information Not Present, 2) Below Expectation, 3) Meets Expectation, 4.) Exceptional.

Faculty teaching this course will gather this data from all majors. The degree program chair and/or program committee will compare average rubric scores compared to historical data. Data will be shared with faculty to be used for continuous improvement.

- **Measures:** At least 80% of students will achieve the rating of at least “meets expectation” on the rubric on paper 1 and on the capstone paper evaluation rubric.

**Projected Enrollment for the First Three Years:**

Year 1: 25

Year 2: 50

Year 3: 100

**Evidence of Market Demand:**

Jobs in the global development sector are increasing locally and worldwide. For instance, DEVEX, the largest job portal in the global development sector, has seen a steady increase in the number of jobs available, and, in April 2022, over 5,000 jobs were seeking applicants on its website. The sectors include international nongovernmental organizations (Red Cross, International Rescue Committee (IRC), CARE, Conservation International, Save the Children), think-tanks, and multilateral agencies (United Nations, World Bank). While some jobs in the field require a master's degree, thousands of jobs are open to those with a bachelor's degree.

In the job category of development economics and international development, Emsi Analyst estimates there are 170,567 jobs in the Southwest and almost 21,000 annual openings, with a predicted increase of 12.4% over the next four years. In Arizona alone, they estimate 17,434 jobs with over 2,000 annual openings and a predicted increase between now and 2025 of 14.8%. Median salary for these positions in the Southwest is \$52,000/year and \$42,000/year in Arizona.

Data from the U.S. Department of Labor O\*NET database is harder to interpret as there is no category dedicated to global development, international development, or even community development. It is clear, however, that there is room for considerable growth in employment for a number of categories that overlap significantly with global development careers. For instance, graduates could find first jobs that could be classified in any of the following categories, all of which have an average or greater predicted growth curve over the next decade:

- 15%+ for Social and Community Service Managers (11-9151.00)
- 10-15% for Fundraising Managers (11-2033.00)
- 15%+ for Social and Human Service Assistants (21-1093.00)
- 5-10% for Social Science Research Assistants (19-4061.00)
- 5-10% for Water Resource Specialists (11-9121.02)
- 15%+ for Community Health Workers (21-1094.00)

Because of the nature of the field, many more jobs will be available to our graduates outside the Southwest and the U.S. Potential employers and networks that already have relationships with ASU include: Chemonics, Welcome to America Project, Arizona Development Network, Society for International Development and the Phoenix Council on Foreign Relations.

**Similar Programs Offered at Arizona Public Universities:**

While undergraduate degrees in international development/development studies exist across the country and even more so around the world, they do not exist in Arizona and there are none that specialize specifically in innovation. There are a few that are related, including the University of Arizona BA in Global Studies, with emphasis in global cultures; health and development; human rights, migrations and social movements; and political economy. This program would touch on some of the areas explored in this degree, but innovative practices in global development is not the focus.

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Northern Arizona University has a Minor in Sustainable and Resilient Communities. As a minor, it is not a direct competitor, and the topics it covers would overlap only slightly with the broader training to be developed in this proposed degree.

To provide students training in complementary areas in which ASU excels, many ASU colleges will collaborate to create tracks of 3-5 courses for the proposed program. These tracks will include curriculum from the Watts College of Public Service and Community Solutions, the School of Politics and Global Studies, the School of Social Transformation, the School of Complex and Adaptive Systems, Mary Lou Fulton Teachers College, and the School of Sustainability. Possible tracks include: "sustainable development," "development through education," "development and local politics," and "development and decolonization."

**Objection(s) Raised by Another Arizona Public University?      YES      NO**

Has another Arizona public university lodged a written objection to the proposed program with the proposing university and the Board of Regents within seven days of receiving notice of the proposed program?

**If Yes, Response to Objections:**

Please provide details of how the proposing university has addressed the objection. If the objection remains unresolved, please explain why it is in the best interests of the university system and the state that the Board override it.

**New Resources Required? (i.e. faculty and administrative positions; infrastructure, etc.):**

No additional state resources will be required, as existing funding will be reallocated.

**Plan to Request Program Fee/Differentiated Tuition?      YES      NO**

**Estimated Amount:** \$110 Per semester

**Program Fee Justification:** This program will be assessed the tier-two college fee.

**Specialized Accreditation?      YES      NO**

**Accreditor:** None required.

## EXECUTIVE SUMMARY

### Request to Establish New Academic Program in Arizona

University: Arizona State University

<b>Name of Proposed Academic Program:</b>  BAE in Middle Grades Education
<b>Academic Department:</b>  Mary Lou Fulton Teachers College  <i>Division of Teacher Preparation</i>
<b>Geographic Site:</b>  Tempe, Polytechnic, West, Downtown Phoenix campuses; ASU@TheGilaValley, ASU@LakeHavasu
<b>Instructional Modality:</b>  Immersion and online
<b>Total Credit Hours:</b>  120
<b>Proposed Inception Term:</b>  2023
<b>Brief Program Description:</b>  The BAE in Middle Grades Education prepares students for teacher certification in grades 5-9 in the state of Arizona.  This program teaches the essential knowledge and skills students need to become highly impactful middle-grade teachers. Students learn to plan and implement evidence-based practices that support the unique needs of adolescents. The middle grades education coursework emphasizes developmentally responsive curriculum, instruction and assessment practices that are grounded in research, empower teachers and students and prioritize equity. In addition to general education and foundational courses, students will select one middle grade content area of focus: English language arts, general science, mathematics, or social studies.  Extensive professional experiences are built into this program to prepare students to enter the teaching profession after graduation. Students will complete internships prior to a full-time teaching residency. Mary Lou Fulton Teachers College has developed a distinctive approach to teacher preparation, which includes student participation in internships and residencies

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while receiving guidance and support from faculty members and highly qualified certified teachers. Professional experiences are designed to prepare graduates to work with mutually supportive colleagues to address the academic and social-emotional needs of learners.

Graduates earn an institutional recommendation from ASU for Arizona Teacher Certification in Middle Grades Education, and an endorsement in Structured English Immersion, preK-12, from the Arizona Department of Education. To teach in an Arizona public school, graduates must pass the appropriate Arizona educator exams: National Evaluation Series or Arizona Educator Proficiency Assessments.

### **Learning Outcomes and Assessment Plan:**

**Learning Outcome 1:** Educational Design and Decision-making: Students in the middle grades program will construct effective learning environments for all learners.

- **Concepts:** instructional cycle, research-based pedagogical practices, high-leverage practices, outcomes, learner abilities, inquiry learner engagement, critical thinking, analysis of learning environments, inclusive practices, equitable learning
- **Competencies:** Students will be able to execute an instructional cycle using methods, strategies, high-leverage practices, technologies, and interventions appropriate for a range of learner abilities, differences, cultural and linguistic assets, and needs supported by research-based pedagogical practices and theories. Create learning experiences that address the central concepts, tools of inquiry, and structure of content disciplines to engage learners in accessible, relevant, and meaningful content to ensure critical thinking and mastery of the content. Create and maintain inclusive, equitable learning environments that support individual and collaborative learning experiences, utilize high-leverage practices and foster critical thinking, active engagement, and well-being for all learners.
- **Assessment Methods:** Students' educational design and decision-making while constructing effective inclusive learning environments will be assessed using the Middle-School Curriculum and Organization rubric. Students will be evaluated as to whether they meet or did not meet the required expectations, and additional guidance will be provided to ensure student success is attainable. Specific portions of assignments will be measured with a rubric and aggregated into one score. Students will be assessed in course assignments that include: TEL 332 - Interdisciplinary Online Module; SED 464 - Interdisciplinary Lesson Plan; TEL 477 - Evaluation of Practice Performance Assessment of Classroom Lesson; SED - 464 Integrating Blended Learning via Station Rotation; TEL 471 - Professionalism; TEL 317 - Classroom-Wide Positive Behavior System.

The program assessment process is a collaborative effort of the faculty and is led by the program strategist and continuous improvement representative with cooperation from the college Office of Data Strategy and Compliance. Data are compiled by the office and provided to the program strategist and continuous improvement representative after the academic year closes. Together they review the annual results and work closely with associated faculty to identify areas for continuous improvement.

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- **Measures:** Students completing the program will be assessed using the common assessment appropriate for the lessons that have been collaboratively developed by teams of faculty targeting the competencies noted above. Common assessments are designed to specifically measure students' mastery of various program-level outcomes (i.e., competencies). Across all assessments, 85% or more students are evaluated as "meet expectations" on the rubric.

**Learning Outcome 2:** Professional Growth, Leadership, Advocacy, & Ethics: Students will demonstrate professional growth, leadership, advocacy and ethics. Students in the middle grades program demonstrate ethical behaviors of professional educators in the classroom and professional experiences.

- **Concepts:** self-reflection, school and organization culture, support for stakeholders, school mission support, positive environment, an environment of trust, professionalism, knowledge of laws and policies, historical and contemporary ethical issues in education, ethical perspectives related to social and cultural problems
- **Competencies:** Students will be able to self-reflect and assess personal contributions to shaping and supporting the mission of their school or organization's goals, positive school climate, and environment of trust. They will apply expectations of the profession including applicable codes of ethics, professional standards of practice, and relevant law and policy — a key ethical issue present in a prominent social or cultural problem in education, including the ways different ethical perspectives influence decision-making related to the issue.
- **Assessment Methods:** Students' effectiveness with professional growth, leadership, advocacy and ethics will be assessed using The Principled Educator rubric during the Self-Selected Professional Learning Project assignment. Students will be evaluated as to whether they meet or did not meet the required expectations, and additional guidance will be provided to ensure student success is attainable. Specific portions of assignments will be measured with a rubric and aggregated into one score. Students will be assessed in course assignments that include: TEL 477 Internship: Advanced – Assignment: Evaluation of Practice Performance Assessment of Classroom Lesson; TEL 470 - Professional Educator Series: Career Growth and Planning – Assignment: Professionalism; TEL 471 - Professional Educator Series: The Principled Educator – Assignment: Self-Selected Professional Learning Project on Professional Advocacy Organizations; TEL 471 - Professional Educator Series: The Principled Educator – Assignment: Professional Advocacy Journal.
- **Measures:** Students completing the program will be assessed using the common assessment appropriate for the lessons that have been collaboratively developed by teams of faculty targeting the competencies noted above. Common assessments are designed to measure students' mastery of various program-level outcomes specifically. Across all assessments, 85% or more students are evaluated as "meet expectations" on the rubric.

**Learning Outcome 3:** Educator Scholar/Educator Scholar and Integrative Knowledge: Students will analyze educational systems with their practical challenges, applying

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contextually relevant “possibility thinking practices” to develop solutions to challenges found in educational settings.

- **Concepts:** inquiry cycle, continuous improvement, collaborative educational systems, positive change guided by research and principles, personalized local and cultural contexts (for the problem of practice), stakeholder voices, assumptions and impacts of local and cultural contexts, synthesis of local, cultural, social, global contexts
- **Competencies:** Students will engage in cycles of inquiry in collaborative educational systems to imagine new concepts, catalyze ideas, and form new solutions, guided by principles and research that create positive change for learners. They will be able to analyze and acknowledge the local/cultural context, personal histories, and experiences relevant to the problem(s) of practice and implement an applied project, synthesizing the findings and defending the significance relevant to the local, social and global context.
- **Assessment Methods:** Students’ effectiveness will be assessed using the Cultivating Networks of Culturally Responsive Relationships rubric during the Cultivating Relationships Showcase assignment. Students will be evaluated as to whether they meet or did not meet the required expectations, and additional guidance will be provided to ensure student success is attainable. Specific portions of assignments will be measured with a rubric and aggregated into one score. Students will be assessed in course assignments that include: SED 464 - Middle-School Curriculum and Organization – Assignment: Interdisciplinary Lesson Plan; TEL 471 - Professional Educator Series: The Principled Educator – Assignment: Self-Selected Professional Learning Project on Professional Advocacy Organizations; TEL 340 - Families, Communities and Cultures: Cultivating Networks of Culturally Responsive Relationships – Assignment: Community Exploration, Examination and Analysis; TEL 340 - Families, Communities and Cultures: Cultivating Networks of Culturally Responsive Relationships – Assignment: Cultivating Relationships Showcase.
- **Measures:** Students completing the program will be assessed using multiple measures (i.e., common assessments) that have been collaboratively developed by teams of faculty targeting the competencies noted above. Common assessments are designed to measure students’ mastery of various program-level outcomes specifically. Across all assessments, 85% or more students are evaluated as “meet expectations” on the rubric.

### Projected Enrollment for the First Three Years:

Year 1: 30  
Year 2: 70  
Year 3: 110

### Evidence of Market Demand:

According to the Bureau of Labor Statistics, "Employment of middle school teachers is projected to grow 7% from 2020 to 2030, about as fast as the average for all occupations.



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About 48,400 openings for middle school teachers are projected each year, on average, over the decade. Many of those openings are expected to result from the need to replace workers who transfer to different occupations or exit the labor force, such as to retire.

Rising student enrollment should increase demand for middle school teachers, but employment growth will vary by region.

The number of students in public middle schools is expected to increase over the coming decade, and the number of classes needed to accommodate these students is projected to rise. Despite expected increases in enrollment in public schools, employment growth for middle school teachers often depends on state and local government budgets. If state and local governments experience budget deficits, they may increase class size while maintaining or reducing teaching staff levels. Conversely, budget surpluses at the state and local level could lead to additional employment growth for middle school teachers."

In Arizona, according to the Arizona Commerce Authority, annual total openings for Middle School teachers include 259 growth openings, 433 people entering a different field, and 332 people exiting the labor force.

Emsi Analyst data shows there were 577,000+ total job postings from Jan. 2020 to Feb. 2022 in the US. The average income for Middle Grade teachers is \$52.1K. Arizona had 11,084 unique postings from Jan. 2020 - Feb. 2022.

**Similar Programs Offered at Arizona Public Universities:**

Arizona began offering teachers the option to be certified in Middle Grades Education in 2018 and no university in Arizona has created a program that leads to this certification. While both NAU and UA offer a variety of education programs, ASU would be the only university in Arizona to offer a program in middle grades education.

**Objection(s) Raised by Another Arizona Public University? YES NO**

Has another Arizona public university lodged a written objection to the proposed program with the proposing university and the Board of Regents within seven days of receiving notice of the proposed program?

**If Yes, Response to Objections:**

Please provide details of how the proposing university has addressed the objection. If the objection remains unresolved, please explain why it is in the best interests of the university system and the state that the Board override it.

**New Resources Required? (i.e. faculty and administrative positions; infrastructure, etc.):**

Internal resources already allocated to the Mary Lou Fulton Teachers College will be reallocated to launch this program and student enrollment will support growth.

**Plan to Request Program Fee/Differentiated Tuition? YES NO**

**Estimated Amount:** N/A

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Program Fee Justification: N/A		
Specialized Accreditation?	YES	NO
<b>Accreditor:</b> The Arizona Department of Education approves programs leading to state certification. The approval allows the university to provide Institutional Recommendations to students upon successful program completion. This eliminates the need for the Arizona Department of Education to conduct a transcript analysis to examine if certification requirements for education and clinical experience are met.		

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### Request to Establish New Academic Program in Arizona

University: Arizona State University

<b>Name of Proposed Academic Program:</b>  BS in International Relations
<b>Academic Department:</b>  The College of Liberal Arts and Sciences <i>School of Politics and Global Studies</i>
<b>Geographic Site:</b>  Tempe, Polytechnic, West and Downtown Phoenix campus
<b>Instructional Modality:</b>  Immersion and online
<b>Total Credit Hours:</b>  120
<b>Proposed Inception Term:</b>  2023
<b>Brief Program Description:</b>  <p>In a globalized world with increasing major power competition that threatens global stability, study in international relations will be all the more prized by both the public and the private sector. International relations majors will gain knowledge in national and international security issues, conflict processes, foreign policy, international trade, international organizations, and will develop an understanding of countries from across the globe. With faculty expertise in this area, combined with an emphasis on critical thinking and communication skills and cross-cultural competencies, students will be prepared for careers as foreign service officers, security analysts, public policy analysts, and more. The degree will also prepare students for graduate education in such fields as International Affairs and Leadership, Global Security, and Political Science.</p> <p>The field of international relations is extraordinarily diverse, with scholars taking both qualitative and quantitative approaches to its study. Students in this BS degree program will obtain rigorous statistical training including both empirical political inquiry and political statistics. Additionally, students will need to fulfill The College of Liberal Arts and Sciences 'Science and Society' requirement for BS students.</p>

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The School of Politics and Global Studies has long had exceptional strengths in the field of international relations. The school also offers an undergraduate degree in Global Studies that is a natural partner to the new degree. Other universities that offer undergraduate degrees (both BA and BS degrees) in international relations include the University of Iowa, Boston University, University of Missouri, Johns Hopkins, and many more.

### Learning Outcomes and Assessment Plan:

**Learning Outcome 1:** Students will demonstrate knowledge of the main theories of international relations (i.e. realism, liberalism, and constructivism) and primary concepts necessary to the study of international relations.

- **Concepts:** realism, liberalism, and constructivism, international relations theory, (state, anarchy, cooperation, conflict, political economy, national security)
- **Competencies:** Students will be able to identify key elements of realism, liberalism, and constructivism, and demonstrate their ability to determine whether an individual is applying a realism, liberalism, or constructivism lens to the analysis of a real-world event. Students will be able to analyze a real-world event using each of these three theories, and to define each of the primary concepts in international relations, provide examples, and explain phenomena using these concepts and terms.
- **Assessment Methods:** Faculty who specialize in the field of international relations will set and review broad expectations and primary learning objectives for the foundational courses in Global Politics and Theories of International Relations. Instructors for those courses will craft shared assessments that will be used in all course sections to determine student mastery of foundational concepts and major international relations theories. Results will be used to examine patterns of competence and guide continuous program improvement.
- **Measures:** Instructors will be required to provide information on the percentage of common assessment questions that each student answered correctly. The annual assessment data will be shared with international relations faculty for their feedback and potential instructional changes to continue to make improvements to the program.

**Learning Outcome 2:** Students will demonstrate proficiency in communicating on topics of international relations in oral/written form using clear and concise language.

- **Concepts:** effective written and oral communication skills; foundational concepts such as the state, anarchy, cooperation, conflict, political economy, and national security; comparison/contrast of theories of international relations
- **Competencies:** Students will be able to demonstrate competence in clearly and effectively describing the three main theories of international relations and communicating the key concepts in writing and/or speech, showing the ability to structure an argument with effective use of evidence and reasoning.
- **Assessment Methods:** Success will be assessed via two measures. First, a faculty-designed rubric will be used to score the effectiveness of written communication in a paper in which students identify the major theories of international relations and

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analyze contemporary events through the lens of these theories. Second, an indirect, survey-based measure of graduating seniors' ratings of their ASU preparation in writing will be used.

- **Measures:** Annual assessment data will be shared with international relations faculty for their feedback and towards continuous program improvement.

**Learning Outcome 3:** Students will demonstrate general competency in research design and methods used in social science research.

- **Concepts:** scientific method use in analyzing global and political events; making observations, creating hypotheses, hypothesis-testing, techniques for data analysis, measurement, sampling methods, correlation vs. causation, qualitative and quantitative methods
- **Competencies:** Students will be able to formulate a research question, craft their own hypotheses and create an appropriate research design about an international relations phenomenon.
- **Assessment Methods:** Students' development of, and ability to apply, research skills and tools will be assessed both via their skill in designing or assessing an original research and via graduating seniors' ratings of how well they acquired skills that will be relevant in the workplace. A comprehensive research-design assignment (which can be done in writing, in person, via a video presentation, or as a group project) will be included in the program. The assignment will assess students' ability to: (1) formulate a research question related to international relations and discuss its significance, (2) propose theoretical explanations and derive testable hypotheses from those explanations, and (3) explain and justify a research method or methods that would be appropriate to test those hypotheses. These will be graded using a faculty-designed rubric, which will assess mastery of creating hypotheses, determining relevant evidence, hypothesis-testing, and the ways in which data can be analyzed.
- **Measures:** Annual assessment data will be shared with International Relations faculty for their feedback and potential instructional changes.

**Learning Outcome 4:** Students will demonstrate general competency in statistical research methods used in social science research.

- **Concepts:** descriptive statistics, frequency distributions, central tendencies, variability, and probability and samples, correlation and regression
- **Competencies:** Students will be able to compute descriptive and some inferential statistical calculations, interpret statistical results, and know what statistical procedures should be used given the data collected.
- **Assessment Methods:** Students' development of, and ability to apply, statistical skills and tools will be assessed both via their abilities as measured in a series of common test bank questions, and via graduating seniors' ratings of how well they acquired skills necessary for quantitative analysis. Faculty will create a question bank that will be used to determine student mastery of foundational statistical concepts and

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competencies. These questions will be used in all sections of required statistical methods courses.

- **Measures:** Annual assessment data will be shared with international relations faculty for their feedback and potential instructional changes.

### Projected Enrollment for the First Three Years:

Year 1: 30  
Year 2: 120  
Year 3: 200

### Evidence of Market Demand:

U.S. Bureau of Labor and Statistics group the international relations degree within the Social Sciences [1]. Employment distribution of workers within this category are mainly in occupations such as management, business and financial operations, educational instruction and library, legal and sales. The median annual wage is \$64,000, which is above the median wage for all fields. The percentage of those employed in an occupation that requires at least a bachelor's degree is 59%, which is comparable to all fields.

A search of O\*NET using "international relations" produced a wide array of careers, many of which are projected to have a bright outlook such as marketing managers; public relations managers; educational, guidance, and career counselors and advisors. Other careers include labor relations specialists, sales managers, and political science teachers for postsecondary [2].

Management occupations will continue to grow as fast as the average for all occupations from 2020-2030. The 2020 median pay for 24 identified areas in management ranges from \$49,160 - \$151,150. [3] In addition, public relations specialists have a job outlook for 2020-30 as growing faster than average. [4]

[1] <https://www.bls.gov/ooh/field-of-degree/social-science/social-science-field-of-degree.htm#emp>

[2] <https://www.onetonline.org/find/result?s=international+relations>

[3] <https://www.bls.gov/ooh/management/home.htm>

[4] <https://www.bls.gov/ooh/media-and-communication/public-relations-specialists.htm>

### Similar Programs Offered at Arizona Public Universities:

University of Arizona does not offer undergraduate degrees in international relations; the BA in Political Science offers a concentration in international relations.

Northern Arizona University offers a BA in International Affairs, which has some similarities to the proposed International Relations degree. The focus of that degree is on understanding the political systems of the world, but takes a broader approach than the ASU degree by combining the political science subfields of comparative politics and international relations together. The NAU degree also includes elements of history, religion, culture, and language.

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<b>Objection(s) Raised by Another Arizona Public University?</b>	<b>YES</b>	<b>NO</b>
Has another Arizona public university lodged a written objection to the proposed program with the proposing university and the Board of Regents within seven days of receiving notice of the proposed program?		
<b>If Yes, Response to Objections:</b> Please provide details of how the proposing university has addressed the objection. If the objection remains unresolved, please explain why it is in the best interests of the university system and the state that the Board override it.		
<b>New Resources Required? (i.e. faculty and administrative positions; infrastructure, etc.):</b> Internal resources already allocated to the school will be reallocated to launch this program and student enrollment will support growth.		
<b>Plan to Request Program Fee/Differentiated Tuition?</b>	<b>YES</b>	<b>NO</b>
<b>Estimated Amount:</b> \$105		
<b>Program Fee Justification:</b> The program will be assessed the tier-two college fee.		
<b>Specialized Accreditation?</b>	<b>YES</b>	<b>NO</b>
<b>Accreditor:</b> None required.		

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### Request to Establish New Academic Program in Arizona

University: Arizona State University

<b>Name of Proposed Academic Program:</b>  BA in International Relations
<b>Academic Department:</b>  The College of Liberal Arts and Sciences <i>School of Politics and Global Studies</i>
<b>Geographic Site:</b>  Tempe, Polytechnic, West and Downtown Phoenix campus
<b>Instructional Modality:</b>  Immersion and online
<b>Total Credit Hours:</b>  120
<b>Proposed Inception Term:</b>  2023
<b>Brief Program Description:</b>  International relations majors will gain knowledge in national and international security issues, conflict processes, foreign policy, international trade, international organizations, and will develop an understanding of countries from across the globe. The School of Politics and Global Studies faculty expertise in this area, combined with an emphasis on critical thinking, communication skills and cross-cultural competency, will prepare students for careers as foreign service officers, security analysts, public policy analysts, and more. The degree will also prepare students for graduate education in fields including international affairs and leadership, global security, and political science.  The school currently offers an undergraduate degree in Global Studies that is a natural partner to the new degree. Other universities that offer undergraduate degrees (both BA and BS degrees) in International Relations include the University of Iowa, Boston University, University of Missouri, Johns Hopkins, and many more.  Similar to our BA degree in Political Science, the BA in International Relations will draw upon The College's second language proficiency requirement for BA degrees. Additionally, the related electives list for the BA degree will focus on humanities and social science courses.



**Learning Outcomes and Assessment Plan:**

**Learning Outcome 1:** Students will demonstrate knowledge of the main theories of international relations (i.e. realism, liberalism, and constructivism) and primary concepts necessary to the study of international relations.

- **Concepts:** realism, liberalism, and constructivism; key concepts in international relations theory, (state, anarchy, cooperation, conflict, political economy, national security)
- **Competencies:** Students will be able to identify key elements of realism, liberalism, and constructivism, and demonstrate their ability to determine whether an individual is applying a realism, liberalism, or constructivism lens to the analysis of a real-world event. Students will be able to analyze a real-world event using each of these three theories, and to define each of the primary concepts in international relations, provide examples of these, and explain phenomena using these concepts and terms.
- **Assessment Methods:** Faculty who specialize in the field of international relations will set and review broad expectations and primary learning objectives for the foundational courses in Global Politics and Theories of International Relations. Instructors for those courses will craft shared assessments that will be used in all course sections to determine student mastery of foundational concepts and major international relations theories. Results will be used to examine patterns of competence and guide continuous program improvement.
- **Measures:** At the conclusion of each academic year, the associate director for undergraduate studies in the school will request data from the faculty members who have taught these courses during the fall and spring semesters; instructors will be required to provide information on the percentage of common test bank questions that each student answered correctly. The annual assessment data will be shared with international relations faculty for their feedback and potential instructional changes, in order to continue to make improvements to the program.

**Learning Outcome 2:** Students will demonstrate proficiency in communicating on topics of international relations in oral/written form using clear and concise language.

- **Concepts:** effective written and oral communication skills; foundational concepts (state, anarchy, cooperation, conflict, political economy, and national security); comparison/contrast of theories of international relations
- **Competencies:** Students will demonstrate competence in clearly and effectively describing the three main theories of international relations and communicating key concepts in writing and/or speech, showing the ability to structure an argument with effective use of evidence and reasoning.
- **Assessment Methods:** Faculty teaching Theories of International Relations will meet to develop a rubric for scoring papers, with special attention to elements of the rubric aimed at clear and effective writing. Students in Theories of International Relations will engage in reading and discussions about key theories of international relations and complete assessments and assignments in which they correctly identify major

theories of international relations and analyze events through the lens of these theories. The measurement tool will be a faculty-developed rubric for assessing writing assignments. At the conclusion of each academic year, the associate director of the school will request the scores on the writing-related portions of this rubric for the International Relations BA majors enrolled in the class. The writing assessment to be assessed will require that they analyze a real-world event through the lens of these major theories. Faculty will be asked to report scores solely on this element of the assignment. Additionally, reporting of the relevant responses on the Graduating Senior Report Card will also be used to measure the program, as an indirect, survey-based measure based on graduating seniors' ratings of their ASU preparation in writing.

- **Measures:** To guide continuous improvement in developing students' communication skills, success will be assessed annually via two measures: first, a rubric that scores the effectiveness of written communication in a paper assignment, and second, survey data. The annual assessment data will be shared with international relations faculty for their feedback and towards our efforts at continuous program improvement. Specific issues or problems identified in annual assessment reports would be taken up for discussion by the School of Politics and Global Studies Undergraduate Studies Committee and/or unit leadership and relevant faculty.

**Learning Outcome 3:** Students will demonstrate general competency in research design and methods used in social science research.

- **Concepts:** scientific method use in and how it can be used to analyze global, political events, making observations, creating hypotheses, hypothesis-testing, techniques for data analyzation and the ways in which data can be analyzed; measurement, sampling methods, correlation vs. causation; qualitative and quantitative methods for analyzing data
- **Competencies:** Students will be able to formulate a research question, craft their own hypotheses, and create an appropriate research design about an international relations phenomenon.
- **Assessment Methods:** Faculty teaching a 300-level INR course will include as a major component of their course a comprehensive research-design assignment (which can be done in writing, in person, via a video presentation, or as a group project). The assignment will assess students' ability to: (1) formulate a research question related to international relations and discuss its significance, (2) propose theoretical explanations and derive testable hypotheses from those explanations, and (3) explain and justify a research method or methods that would be appropriate to test those hypotheses. These will be graded using a rubric, which will assess mastery of creating hypotheses, determining relevant evidence, hypothesis-testing, and the ways in which data can be analyzed. At the conclusion of each academic year, the school associate director will request data from instructors on the scores of all BS International Relations majors on this assignment. Reporting of the relevant responses on the Graduating Senior Report Card will also be used to measure the program.

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- **Measures:** Students' development of, and ability to apply, research skills and tools will be assessed both via their skill in designing or assessing an original research project and via graduating seniors' ratings of how well they acquired skills that will be relevant in the workplace. The annual assessment data will be shared with international relations faculty for their feedback and potential instructional changes. Specific issues or problems identified in annual assessment reports would be taken up for discussion by the School of Politics and Global Studies Undergraduate Studies Committee and/or unit leadership and relevant faculty in an effort to generate continuous program improvement

**Projected Enrollment for the First Three Years:**

Year 1: 30

Year 2: 120

Year 3: 200

**Evidence of Market Demand:**

U.S. Bureau of Labor and Statistics group the international relations degree within the Social Sciences [1]. Employment distribution of workers within this category are mainly in occupations such as management, business and financial operations, educational instruction and library, legal and sales. The median annual wage is \$64,000, which is above the median wage for all fields. The percentage of those employed in an occupation that requires at least a bachelor's degree is 59%, which is comparable to all fields.

A search of O\*NET using "international relations" produced a wide array of careers, many of which are projected to have a bright outlook such as marketing managers; public relations managers; educational, guidance, and career counselors and advisors. Other careers include labor relations specialists, sales managers, and political science teachers for postsecondary [2].

Management occupations will continue to grow as fast as the average for all occupations from 2020-2030. The 2020 median pay for 24 identified areas in management ranges from \$49,160 - \$151,150. [3] In addition, public relations specialists have a job outlook for 2020-30 as growing faster than average. [4]

[1] <https://www.bls.gov/ooh/field-of-degree/social-science/social-science-field-of-degree.htm#emp>

[2] <https://www.onetonline.org/find/result?s=international+relations>

[3] <https://www.bls.gov/ooh/management/home.htm>

[4] <https://www.bls.gov/ooh/media-and-communication/public-relations-specialists.htm>

**Similar Programs Offered at Arizona Public Universities:**

University of Arizona does not offer undergraduate degrees in international relations; the BA in Political Science offers a concentration in international relations.

Northern Arizona University offers a BA in International Affairs, which has some similarities to the proposed International Relations degree. The focus of that degree is on understanding the political systems of the world, but takes a broader approach than the ASU degree by

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combining the political science subfields of comparative politics and international relations together. The NAU degree also includes elements of history, religion, culture, and language.

**Objection(s) Raised by Another Arizona Public University?      YES      NO**

Has another Arizona public university lodged a written objection to the proposed program with the proposing university and the Board of Regents within seven days of receiving notice of the proposed program?

**If Yes, Response to Objections:**

Please provide details of how the proposing university has addressed the objection. If the objection remains unresolved, please explain why it is in the best interests of the university system and the state that the Board override it.

**New Resources Required? (i.e. faculty and administrative positions; infrastructure, etc.):**

Internal resources already allocated to the school will be reallocated to launch this program and student enrollment will support growth.

**Plan to Request Program Fee/Differentiated Tuition?      YES      NO**

**Estimated Amount:** \$105

**Program Fee Justification:** The program will be assessed the tier-two college fee.

**Specialized Accreditation?      YES      NO**

**Accreditor:** None required.

## EXECUTIVE SUMMARY

### Request to Establish New Academic Program in Arizona

University: Arizona State University

<b>Name of Proposed Academic Program:</b>  BS in Earth and Environmental Sciences
<b>Academic Department:</b>  The College of Liberal Arts and Sciences <i>School of Earth and Space Exploration</i>
<b>Geographic Site:</b>  Tempe, Polytechnic, Downtown Phoenix, West campus
<b>Instructional Modality:</b>  Immersion and online
<b>Total Credit Hours:</b>  120
<b>Proposed Inception Term:</b>  2023
<b>Brief Program Description:</b>  <p>The BS in Earth and Environmental Sciences will provide a foundational understanding of the evolution of the Earth system with an emphasis on Earth's surface, oceans and climate and implications for sustainable human societies. The degree includes broad training in the physical sciences, especially process-oriented geosciences that focus on Earth's life-sustaining surface environment.</p> <p>The degree builds on the existing BA in Earth and Environmental Studies with a stronger quantitative foundation and advanced quantitative electives that build on this foundation. The degree includes innovative courses in the Earth system science core. This interdisciplinary degree will prepare students for technical career paths, helping Arizona and the global community address some of the most pressing challenges of the day in environmental health, climate change and natural resources. The degree will prepare students for graduate study in the natural and environmental sciences or education, environmental public policy and environmental management. Students will be prepared well for "green" professional careers in fields such as education, environmental reporting, public planning, environmental consulting, natural resource management, and more technical positions as environmental scientists in a variety of sub-disciplines.</p>

**EXECUTIVE SUMMARY****Learning Outcomes and Assessment Plan:**

**Learning Outcome 1:** Students will be able to apply both qualitative and quantitative methods of science to analyze Earth-system and environmental data.

- **Concepts:** biological, chemical, geological, and physical processes in natural systems; Earth-system materials and components, including the origins and distribution of natural resources; tectonic activity; natural hazards; the function of surface environments and ecosystems; physical, chemical, and biologic processes in world oceans; Earth-system history
- **Competencies:** Students will be able to apply skills in scientific problem-solving; data collection, analysis and interpretation; spatial reasoning; evaluation of uncertainties; making scientific predictions and recommendations; and communicating observations, interpretations, predictions, and recommendations, including clear statements of uncertainty.
- **Assessment Methods:** In Dynamic Earth, students will analyze the structure and composition of resource minerals, and relative motions and rates of tectonic activity. Similarly, in Oceanography, students will analyze environmental data in evaluation of fundamental aspects of the evolution of physical, chemical and biological properties of the world oceans. A faculty-designed rubric to assess mastery will be applied to three problem sets in each course. Program assessment data will be reviewed annually by the School of Earth and Space Exploration Associate Director for Undergraduate Programs, and the results will be reviewed by school leadership and faculty.
- **Measures:** Seventy percent or more of Earth and Environmental Sciences BS majors will score "satisfactory" or above on the rubrics. If problems are revealed, a faculty working group led by the Associate Director for Undergraduate Programs will be established to determine optimal corrective actions, such as updating program curricula or revising specific courses to better satisfy program learning outcomes. Working group recommendations will be considered and discussed by the full faculty.

**Learning Outcome 2:** Students will be able to synthesize core concepts of Earth system science and societal factors to analyze linkages among Earth-system processes, environmental conditions and human societies.

- **Concepts:** atmosphere, hydrosphere, biosphere, and geosphere; biogeochemical cycles; the influence of human activity on the function of landscapes and ecosystems, the health of terrestrial and ocean environments, and on global climate; distribution of resources, pollutants, and hazards in relation to socio-economic factors
- **Competencies:** Students will be able to apply skills in the development and testing of hypotheses; synthesis of scientific data and interpretations with relevant socio-economic context; evaluation of societal implications of scientific data and management decisions; development of scientific recommendations for policy makers; and communication of implications to stakeholders.
- **Assessment Methods:** Demonstration of student mastery of these concepts and competencies will be evaluated in the core courses Dynamic Earth, Oceanography,

## EXECUTIVE SUMMARY

and Earth's Critical Zone. In Dynamic Earth, students will integrate observations and the theory of tectonics as it relates to the global distribution of natural hazards, the origin and concentration of Earth resources, and associated environmental impacts. In Critical Zone, students will develop testable hypotheses related to aspects of the evolution of earth surface environments and the impact of human activities. In Oceanography, students will apply analysis of environmental data in evaluation of fundamental aspects of the co-evolution of oceans, climate, and human activities. A faculty-developed rubric will be applied to appropriate portions of the final exam in each course. Program assessment data will be reviewed by school leadership and faculty.

- **Measures:** Seventy percent or more of Earth and Environmental Sciences BS majors will score "satisfactory" or above on the rubrics. If problems are revealed, a faculty working group led by the Associate Director for Undergraduate Programs will be established to determine optimal corrective actions, such as updating program curricula or revising specific courses to better satisfy program learning outcomes. Working group recommendations will be considered and discussed by the full faculty.

**Learning Outcome 3:** Students will be able to collaborate effectively in interdisciplinary groups to evaluate societally significant environmental problems and propose viable solutions.

- **Concepts:** scientific investigation to address authentic, complex environmental problems scientific, engineering, environmental, social, and economic; cooperation within interdisciplinary teams' practical solutions to real problems
- **Competencies:** Students will be able to integrate core and advanced scientific knowledge and methods; develop communication skills and civil discourse to effectively collaborate within an interdisciplinary team; coordinate effort management within teams; demonstrate independent research; critical thinking; problem solving; presenting and defending proposed solutions to complex environmental problems, and then communicate the implications to stakeholders.
- **Assessment Methods:** Demonstration of student mastery of these concepts and competencies will be evaluated in the capstone project in Solving Environmental Problems, in which students work collaboratively in teams applying core knowledge and skills gained in their coursework to develop plausible solutions for complex, real-world environmental problems. A faculty-designed rubric is used to assess (1) student's mastery of principles of Earth and environmental sciences to design effective solutions to environmental problems and (2) student's skill in communication and collaboration as part of an interdisciplinary team. In measure one, the rubric assesses students both on their contributions to development of the proposed solution, the viability of the solution, and the quality of the integrative scientific analysis underlying the proposed solution. In measure two, the rubric assesses students both on their ability to collaborate effectively with their peers in diverse groups, and on their ability to clearly communicate the group's proposed solution. In measure three, the Graduating Student Report Card exit survey asks for students' perceptions of their analytical skills, communication skills and ability to collaborate in the workforce. Program assessment data will be reviewed by school leadership and

**EXECUTIVE SUMMARY**

the faculty for continuous improvement.

- Measures:** Seventy percent or more of Earth and Environmental Science BS majors will score "satisfactory" or above on the rubrics. The program will also be assessed based on the Graduating Student Report Card exit survey item "skills in – thinking critically and analytically" and "acquiring job or work-related knowledge and skills." Satisfactory program performance is indicated when 70% of students rate that ASU contributed "very much", "quite a bit", or "some" to knowledge and skills. If problems are revealed, a faculty working group will be established to determine optimal corrective actions, such as updating program curricula or revising specific courses to better satisfy program learning outcomes. Working group recommendations will be considered and discussed by the full faculty.

**Projected Enrollment for the First Three Years:**

Year 1: 10

Year 2: 30

Year 3: 70

**Evidence of Market Demand:**

Polling of current students indicates a strong demand for the Earth and Environmental Sciences BS, with 70% of respondents indicating they would prefer to switch to the BS degree. This aligns with a nationwide trend toward a preference for BS degrees in the natural sciences, driven by employers. The school also expects students less interested in math, statistics, and chemistry will prefer to remain in the BA.

According to the U.S. Bureau of Labor Statistics, there are many career opportunities available to students who complete a BS in Earth and Environmental Science, including but not limited to: environmental scientist (87k jobs in 2020, 8% growth, median salary \$73k), geoscientist (29k jobs in 2020, 7% growth, median salary \$93k), conservation scientist/natural resource manager (39k jobs in 2020, 7% growth, median salary \$64k), hydrologist (6.5k jobs in 2020, 6% growth, median salary \$84k), geological and hydrologic technicians (17k jobs in 2020, 8% growth, median salary \$73k), natural science manager (79k jobs in 2020, 9% growth, median salary \$51k), environmental science technician (34k jobs in 2020, 11% growth, median salary \$47k), and environmental science educator (secondary education 999k jobs in 2020, 8% growth, median salary \$63k). These data are corroborated in data reported by the Occupational Information Network.

In a brief on geoscience employment growth in January 2022, the American Geosciences Institute reported strong employment growth since March 2021 in areas of environmental geoscience, stating that "Between March and November 2021, the largest percentage change in employment occurred in atmospheric and space scientist occupations (205%) followed by environmental engineering (167%), and then environmental and geoscience technician (94%) occupations. However, the strongest absolute increase in geoscience employment over the same period was in geoscientist and environmental scientist occupations (+41,100 jobs) and environmental engineering occupations (+37,900 jobs)." (Geoscience Employment Growth Continues Through 2021 | American Geosciences Institute; <https://www.americangeosciences.org/geoscience-currents/geoscience-employment-growth-continues-through-2021>).



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**Similar Programs Offered at Arizona Public Universities:**

Environmental science programs are currently viewed as core programs at most universities. This reflects increasing emphasis on interdisciplinary research, overwhelming societal need for environmental problem solving, and a desire of the current generation of students to address societally relevant issues. The existence of complementary environmental science programs at all the Arizona public universities supports a broadly acknowledged need for more environmental scientists in the American workforce.

**University of Arizona**

Environmental Studies BA, College of Social and Behavioral Sciences – A degree focused on the environment from a social science and policy perspective

Environmental Science BS, College of Agriculture and Life Sciences – A broad environmental science degree with concentrations (emphases) in (a) Leadership, Sustainability, and Communication, (b) Physical and Chemical Dynamics, (c) Soil, Air, and Water, and (d) The Biosphere.

**Northern Arizona University**

Environmental and Sustainability Studies BA and BS, School of Earth and Sustainability – These degrees focus on ecosystems and have a larger social science component than our degree, as is common to degrees in "environmental studies"

Environmental Sciences BS, School of Earth and Sustainability – The degree includes concentrations or emphases in: Environmental Geology, Applied Statistics, Environmental Administration and Policy, Biology, Chemistry, Climate, Environmental Communication, and Environmental Management. The proposed degree can be best described as a blending of aspects of the Environmental Geology, Chemistry, Climate emphases

**Objection(s) Raised by Another Arizona Public University? YES NO**

Has another Arizona public university lodged a written objection to the proposed program with the proposing university and the Board of Regents within seven days of receiving notice of the proposed program?

**If Yes, Response to Objections:**

Please provide details of how the proposing university has addressed the objection. If the objection remains unresolved, please explain why it is in the best interests of the university system and the state that the Board override it.

**New Resources Required? (i.e. faculty and administrative positions; infrastructure, etc.):**

No additional state resources are required as existing funds will be reallocated.

**Plan to Request Program Fee/Differentiated Tuition? YES NO**

**Estimated Amount:** \$525 per semester

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<b>Program Fee Justification:</b> Science programs in The College of Liberal Arts and Sciences are assessed the tier-four college fee.		
<b>Specialized Accreditation?</b>	YES	<b>NO</b>
<b>Accreditor:</b> None		

## EXECUTIVE SUMMARY

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### Request to Establish New Academic Program in Arizona

University: Arizona State University

<b>Name of Proposed Academic Program:</b>
BA in Entrepreneurial Leadership
<b>Academic Department:</b>
W. P. Carey School of Business
<b>Geographic Site:</b>
West, Tempe, Polytechnic, Downtown Phoenix campuses
<b>Instructional Modality:</b>
Immersion and online
<b>Total Credit Hours:</b>
120
<b>Proposed Inception Term:</b>
2023
<b>Brief Program Description:</b>
<p>The BA in Entrepreneurial Leadership prepares students to lead and manage entrepreneurial organizations for long-term success.</p> <p>This program will develop entrepreneurial-minded leaders who can effectively manage the value-creation process of existing small and medium-sized businesses, as well as new ventures. Students will become leaders by developing a broad entrepreneurial mindset and leadership style that enables them to seize opportunities and to develop and nurture those opportunities within their organizations through effective communication, team building, critical thinking and problem-solving skills.</p> <p>To achieve the goals outlined above, this degree provides broad foundations in entrepreneurship, leadership, and business foundations (e.g., finance, marketing, accounting, supply chain, and management) and combines those with sought after data analytics skills to create entrepreneurial leaders that can excel in starting their own ventures as well as in creating value in existing small and medium-sized organizations. Combining leadership and entrepreneurship with data analytics is what sets this degree apart from other entrepreneurship, leadership, and business programs.</p>

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This program is designed to serve the West Valley of the Phoenix metropolitan area by creating nascent entrepreneurs and increasing entrepreneurial activity and knowledge in this growing area.

### Learning Outcomes and Assessment Plan:

**Learning Outcome 1:** Students will demonstrate proficiency in critical thinking.

- **Concepts:** identifying and building information and arguments; exploration of issues and problems in a business setting, formulating opinions and drawing conclusions about situations; clarity, accuracy, precision, consistency, relevance, sound evidence, good reasons, depth, breadth and fairness
- **Competencies:** Students will be able to collect relevant information in regards to a case study or problem. They will be able to assess an external situation by interpreting and explaining challenges and identifying key issues in a business problem/situation by correctly identifying author opinion, and by assessing existing evidence-based conclusions. Students will be able to take a position and build arguments to extend those conclusions.
- **Assessment Methods:** In the capstone course, students will analyze a case or an article. The project will be assessed using a rubric for critical thinking skills. Information will be shared with departmental and school leadership and faculty curriculum committees to be used as part of a discussion around curricular changes and continuous program improvement. The program will also be assessed based on the Graduating Student Report Card question regarding how well students indicate they were prepared to think critically.
- **Measures** At least 75% of the sampled students will achieve a score of 70% or greater thus demonstrating critical thinking on the rubric-based assessment. Additionally, 75% or more of students surveyed at graduation will evaluate the quality of their university preparation to "think critically and analytically as "quite a bit" or "very much". Similarly, 75% or more of alumni surveyed three years after graduation will rate their preparation to think critically and analytically at a level of "quite a bit" or "very much."

**Learning Outcome 2:** Students will demonstrate proficiency in communication.

- **Concepts:** readability, mechanics, organized writing, content development, evidence, genre and disciplinary conventions, sources and citations
- **Competencies:** As outlined in the written communication VALUE rubric, students will demonstrate ability to use appropriate and relevant content and evidence to demonstrate their understanding of article, assignment, and audience; demonstrate proper use of conventions for business writing, such as organization, format, and style; use language that is clear and concise; demonstrate command of syntax and mechanics to ensure meaning is clear for readers.

- **Assessment Methods:** Proficiency in written communication will be assessed based on a rubric in the capstone class where students demonstrate their communication skills by analyzing a case or an article. Information will be shared with departmental and school leadership and faculty curriculum committees to be used as part of discussion around curricular changes and continuous program improvement.
- **Measures:** At least 75% of the sampled students will achieve a score of 70% or greater thus demonstrating proficiency in communication on the rubric-based assessment. Additionally, students surveyed at graduation (Graduating Student Report Card) will evaluate the quality of their university preparation to "write clearly and effectively" with 75% or more of surveyed students rating their preparation at a level of "quite a bit" or "very much." Alumni surveyed three years after graduation (University Alumni Survey) will evaluate the quality of their university preparation to "write clearly and effectively" with 75% or more of alumni respondents rating their preparation at a level of "quite a bit" or "very much."

**Learning Outcome 3:** Students will evaluate the components of a sustainable entrepreneurial organization, demonstrating discipline-specific knowledge.

- **Concepts:** entrepreneurial philosophy and founder self-awareness, strategy formation, authentic persuasion, management of talent, operational leadership, growth management, founder psychology, entrepreneurial ethics, economic/industry landscapes and forces at play
- **Competencies:** Students will be able to explain the history of entrepreneurial organizations and their leadership, and identify what motivates sustainable organizations and people in them to achieve. Students will be able to evaluate a framework of accountability.
- **Assessment Methods:** Students will examine and respond to a case study or business article to demonstrate in-depth knowledge of leading entrepreneurial teams or organizations, and will be assessed using a rubric created and agreed upon by the instructors teaching the course. Results will be shared with departmental and school leadership, as well as faculty curriculum committees to be used as part of discussion around curricular changes and continuous program improvement.
- **Measures:** As a direct measure, at least 75% of students assessed will achieve 70% or higher on the assignment, demonstrating discipline-specific knowledge. Additionally, students surveyed at graduation (Graduating Student Report Card) will evaluate the quality of preparation in "acquiring job or work-related knowledge and skills." 75% or more of surveyed students will rate their preparation at a level of "quite a bit" or "very much."

**Projected Enrollment for the First Three Years:**

Year 1: 30

Year 2: 60

Year 3: 90

**Evidence of Market Demand:**

This degree program provides a broad foundation in business while focusing on leading and managing entrepreneurial organizations. During the pandemic, many startups emerged. Per the Census Bureau, more than 4.4 million new businesses were created in the U.S. during 2020 - the highest total on record. It was then shattered again in 2021, when 5.4 million new businesses were started. In addition to learning how to manage entrepreneurial organizations, skills acquired in this degree program will prepare students for positions such as financial managers, marketing managers, general and operations managers, or project managers. In 2021, Emsi Analyst reports 4.12 million jobs in these occupations in the U.S., and it is expected to grow at an average of 6.5% between 2021-2026.

The U.S. Bureau of Labor Statistics does not provide a specific job outlook for entrepreneurs but states that entrepreneurs are the driving force of a market economy. There are 9.6 million self-employed entrepreneurs in America and BLS predicts the growth of entrepreneurs to outpace the growth rate for all workers. BLS also reports that in 2020, there are 681,700 finance managers jobs, 316,800 marketing managers jobs, 2,704,400 general and operations manager jobs, and 1,777,000 project management jobs. Finance, marketing, general and operations managers, and project management jobs are expected to grow 17%, 10%, 8%, and 6%, respectively, between 2020-2030.

**Similar Programs Offered at Arizona Public Universities:**

In addition to the other business programs offered by Eller College of Management, the University of Arizona has a BS in Business Administration in Entrepreneurship. That particular program has a strong focus on new venture development, which differs from the focus on existing opportunities of the ASU degree. The University of Northern Arizona offers a BS and a BA degree in Management with an emphasis area in Entrepreneurship and Business Development, as well as a Bachelor of Business Administration with an emphasis in Entrepreneurship and Small Business.

There are three aspects that broadly distinguish our entrepreneurial leadership program from the above programs. First, we combine leadership and entrepreneurship to focus on the skills, knowledge, and insight entrepreneurial managers need to start, build, and lead their own ventures as well as to create value in existing organizations. A second distinguishing factor is that we incorporate classes in data analytics to help our future entrepreneurs become more skilled in underlying business processes and business intelligence as those data-related aspects become ever more important parts of any business. Finally, the entrepreneurial leadership program will primarily serve ASU students at the West campus.

At ASU, W. P. Carey offers a BS in Business Entrepreneurship at the Tempe campus. The proposed degree program differs from that program in several ways

- Dual focus on leadership and entrepreneurship where our BS degree focuses more squarely on entrepreneurship
- Incorporation of data analytics
- More focus on providing required skills starting, leading, and creating value in small and medium-sized businesses, including those based on franchising and licensing.

## EXECUTIVE SUMMARY

Additionally, ASU offers several entrepreneurship degrees with specific industry focuses (such as food, nutrition, health, and technology).

**Objection(s) Raised by Another Arizona Public University? YES NO**

Has another Arizona public university lodged a written objection to the proposed program with the proposing university and the Board of Regents within seven days of receiving notice of the proposed program?

**If Yes, Response to Objections:**

Please provide details of how the proposing university has addressed the objection. If the objection remains unresolved, please explain why it is in the best interests of the university system and the state that the Board override it.

**New Resources Required? (i.e. faculty and administrative positions; infrastructure, etc.):**

No additional state resources will be required as existing resources will be reallocated to support this program.

**Plan to Request Program Fee/Differentiated Tuition? YES NO**

**Estimated Amount:** \$525 per semester

**Program Fee Justification:** W. P. Carey School of Business programs are assessed the tier-four college fee.

**Specialized Accreditation? YES NO**

**Accreditor:** This program will be accredited by AACSB, the Association to Advance Collegiate Schools of Business.

## EXECUTIVE SUMMARY

### Request to Establish New Academic Program in Arizona

University: Arizona State University

<b>Name of Proposed Academic Program:</b>  PhD in Biostatistics
<b>Academic Department:</b>  College of Health Solutions
<b>Geographic Site:</b>  Tempe, West, Downtown, Polytechnic campus
<b>Instructional Modality:</b>  Immersion
<b>Total Credit Hours:</b>  84
<b>Proposed Inception Term:</b>  2025
<b>Brief Program Description:</b>  <p>In collaboration with health researchers, the PhD in biostatistics is designed to train students in advanced biostatistical methods, analytical skills in theory, and health methods to provide better health solutions. Students will be trained to design valid biostatistical study design and advanced data analyses so that they are prepared to become leaders in health research.</p> <p>This program is a natural progression of the health-related programs within the College of Health Solutions in which health-related data are leveraged for better health solutions. Better health solutions require better health methods in biostatistics.</p> <p>This degree will increase the number, quality and diversity of translational researchers, promote research and intellectual exchange among diverse professionals, and advance health care research priorities. This degree program supports ASU's mission of advancing research and assuming fundamental responsibility for the overall health of the communities it serves through graduate-level education to design, implement, evaluate, and disseminate research to improve health outcomes of individuals, systems and populations.</p>



**Learning Outcomes and Assessment Plan:**

**Learning Outcome 1:** Students will apply fundamental biostatistical theory and methods to solve health-related problems.

- **Concepts:** advanced theory in probability and biostatistics, biostatistical modeling, maximum likelihood methods, hypothesis testing, parametric and non-parametric biostatistics
- **Competencies:** Students will be able to apply their critical thinking based on learned theory, modeling, and methods. They will be able to extend and develop the biostatistical theory to solve health-related problems.
- **Assessment Methods:** The theory component of the final project of a Biostatistical Theory and Inference course will be used to measure student understanding of fundamental biostatistical theory. The biostatistics methods project from a Survival Analysis course will be used to measure students' ability to apply critical thinking and biostatistical methods to provide a solution to a health-related problem. For indirect measures, a PhD in Biostatistics exit survey will be administered to graduating students each term with questions that measure students' preparedness in learned theory, modeling and methods. In consultation with the PhD Biostatistics Curriculum Committee, the program director will monitor average rubric scores, survey results, and progress data compared to historical data in an annual assessment review to guide continuous course and program improvement.
- **Measures:** Faculty-developed rubrics will be used to assess students' understanding and ability to apply critical thinking, theory and biostatistical methods in research. Data compiled from the final projects, the PhD Biostatistics Exit Survey, and student progress data from the curriculum and academic planning team will be used to measure student-reported preparedness for the outcome. The curriculum will be refined based on the combined data analysis that measures the student's ability to develop and apply fundamental biostatistical theory and methods to solve health-related applications.

**Learning Outcome 2:** Students will conduct advanced data analysis using biostatistical methods in biomedical clinical trials or public health intervention studies.

- **Concepts:** linear and generalized linear models, longitudinal and multilevel modeling, survival data analysis, clinical trial design, and Bayesian analysis
- **Competencies:** Students will be able to identify an appropriate biostatistical method for their research question in the area of clinical trials and public health intervention studies, conduct a research project, compile data, select an appropriate statistical software to analyze the data, and successfully present their findings in a report with graphic visualization.
- **Assessment Methods:** Final projects in Applied Multi-level and Longitudinal Data Analysis and Applied Clinical Trial Design and Analysis courses will be evaluated using a faculty-designed rubric to assess students' ability to conduct advanced data analysis using biostatistical methods in clinical trials and public health intervention

## EXECUTIVE SUMMARY

studies. Additionally, a PhD in Biostatistics exit survey will be administered to graduating students with questions that measure students' preparedness in advanced data analysis using biostatistical methods in clinical trials and public health intervention studies. In consultation with the PhD Biostatistics Curriculum Committee, the program director will monitor average rubric scores, survey results, and progress data compared to historical data in an annual assessment review. The review of outcomes will allow opportunities for continuous course and program improvement.

- **Measures:** Faculty-developed rubrics will be used to assess students understanding of advanced data analysis using biostatistical methods in the final projects of Applied Multi-level and Longitudinal Data Analysis and Applied Clinical Trial Design and Analysis, and to evaluate the students' ability to conduct advanced data analysis in clinical trials and public health intervention studies. Data compiled from the final project rubrics, the PhD Biostatistics exit survey and student progress data from the curriculum and academic planning team will be used to measure student-reported preparedness for the outcome. The curriculum will be refined based on the combined data analysis that measures the student's ability to conduct advanced data analysis using biostatistical methods in clinical trials and public health intervention studies.

**Learning Outcome 3:** Students will conduct independent, original research to solve a health-related challenge and present their findings in a written dissertation and oral defense.

- **Concepts:** independent research process, research study design, consultation, data-driven solutions, effective oral and written communication
- **Competencies:** Students will identify a research question, conduct a systematic literature review, analyze data with the existing methods as well as develop novel biostatistical methods, successfully present findings in a dissertation and oral defense, and effectively find a solution to a health-related challenge.
- **Assessment Methods:** The final dissertation produced by each student will be assessed by measuring success in leading independent research in the health-related challenge, and the student's ability to present and successfully defend their findings. Additionally, a PhD in Biostatistics exit survey will be administered to graduating students with questions that measure students' preparedness for independent research, study design, the ability to design data-driven solutions and effectively communicate findings. In consultation with the PhD Biostatistics Curriculum Committee, the program director will monitor average rubric scores, survey results, and progress data compared to historical data in an annual assessment review. The review of outcomes will inform continuous program improvement.
- **Measures:** Faculty-developed rubrics will be used to assess students' ability to identify a research question, conduct a systematic literature review, develop novel biostatistical methods, and analyze data in the course of completion of the dissertation. In addition, rubrics will be used to measure the student's ability to successfully present findings in a dissertation and oral defense, effectively finding a solution to a health-related challenge. Data compiled from the dissertation, defense results, and the PhD Biostatistics exit survey will be used to measure preparedness for the outcome. The curriculum will be refined based on the combined data analysis

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that measures the student's ability to conduct independent original research to solve a health-related challenge.

### **Projected Enrollment for the First Three Years:**

Year 1: 2  
Year 2: 5  
Year 3: 10

### **Evidence of Market Demand:**

Biostatisticians, statisticians, and data scientists are all classified as "Bright Outlook Occupations" from the U.S. Bureau of Labor Statistics, which are officially defined as occupations that are expected to grow rapidly in the next several years with large numbers of job openings. They are new and emerging occupations. Emsi Analytics provides additional market analyses indicating high demand for medical scientists. The market results from Emsi and the Bureau of Labor Statistics provided below indicate very positive growth opportunities in biostatistics.

According to Emsi Analyst, there were a total of 1,190 educational program completions at 77 institutions in 2020, of which 19% were at the doctoral level. There were 22,445 unique job postings between September 2016 to November 2021 for "biostatisticians", 69% of which require a master's degree and 62% of which require a master's or PhD. For every four job postings there is one unique job posting, which indicates there is a slightly higher than average effort toward hiring for these positions (the national average is three to one). (Biostatisticians "Develop and apply biostatistical theory and methods to the study of life sciences") (O\*NET: <https://www.onetonline.org/link/summary/15-2041.01>).

The U.S. Bureau of Labor and Statistics reports (accessed on 10/13/2021: <https://www.bls.gov/ooh/math/mathematicians-and-statisticians.htm>) that the overall employment of statisticians and mathematicians is projected to grow 33% from 2020 to 2030, much faster than the average for all occupations. About 5,200 openings for mathematicians and statisticians are projected each year, on average, over the decade. Many of those openings are expected to result from the need to replace workers who transfer to different occupations or exit the labor force, such as to retire. The median annual wage for statisticians was \$92,270 in May 2020.

### **Similar Programs Offered at Arizona Public Universities:**

The University of Arizona PhD in biostatistics prepares students who have demonstrated excellence in mathematics and the sciences to become research biostatisticians. The proposed PhD in biostatistics at ASU has some similarities with the University of Arizona program as both are research-oriented with a focus on developing biostatistical methods for public health application. However, our proposed PhD in biostatistics is designed to fill the gap in collaborative research in the areas of behavioral science, biomedical informatics and diagnostics, kinesiology and exercise science, health care delivery, nutrition, population health, and speech and hearing within the College of Health Solutions, as well as other academic areas at ASU.

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<b>Objection(s) Raised by Another Arizona Public University?</b>	<b>YES</b>	<b>NO</b>
Has another Arizona public university lodged a written objection to the proposed program with the proposing university and the Board of Regents within seven days of receiving notice of the proposed program?		
<b>If Yes, Response to Objections:</b> Please provide details of how the proposing university has addressed the objection. If the objection remains unresolved, please explain why it is in the best interests of the university system and the state that the Board override it.		
<b>New Resources Required? (i.e. faculty and administrative positions; infrastructure, etc.):</b>  Internal resources already allocated to the College of Health Solutions will be reallocated to launch this program and student enrollment will support growth.		
<b>Plan to Request Program Fee/Differentiated Tuition?</b>	<b>YES</b>	<b>NO</b>
<b>Estimated Amount:</b> N/A		
<b>Program Fee Justification:</b> N/A		
<b>Specialized Accreditation?</b>	<b>YES</b>	<b>NO</b>
<b>Accreditor:</b> N/A		

## EXECUTIVE SUMMARY

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### Request to Establish New Academic Program in Arizona

University: Arizona State University

<b>Name of Proposed Academic Program:</b>  PhD in Robotics and Autonomous Systems
<b>Academic Department:</b>  Ira A. Fulton Schools of Engineering  <i>School of Manufacturing Systems and Networks</i>
<b>Geographic Site:</b>  Tempe, West, Downtown, Polytechnic campus
<b>Instructional Modality:</b>  Immersion
<b>Total Credit Hours:</b>  84
<b>Proposed Inception Term:</b>  2023
<b>Brief Program Description:</b>  <p>The PhD in Robotics and Autonomous Systems will provide students with the skills to pursue research in the area of robotics and autonomous systems. Specifically, the students will study advanced topics in wearable robots, human-robot interactions, drones, autonomous ground and aerial vehicles, robot teams, swarm robotics, artificial intelligence, and machine learning applications in robotics, robotics in manufacturing, Industry 4.0, probabilistic robotics, and edge computing. The focus will be on fusing intellectual disciplines, industrial applications, and robots to improve quality of life and quality of work. Some of the relevant course subjects may include multi-robot systems; applied machine learning; robotics, modeling and control of robots; deep learning; artificial intelligence; and fundamentals of statistical learning. This program will fuse knowledge from various engineering disciplines and train students to conduct use-inspired research that is socially embedded and impactful.</p> <p>This program is aligned with Arizona State University's access excellence impact mission. Students will be from diverse backgrounds and nurtured to succeed academically and professionally. The program will focus on rigorous advanced training that will enable the graduates to pursue industry or academic positions, and focus on use-inspired robotics research, promote independence and help students achieve success. The program will</p>

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establish close ties with local industry to support Industry 4.0 revolution and will be deeply engaged with New Economy Initiatives and use-inspired research that is impactful.

**Learning Outcomes and Assessment Plan:**

**Learning Outcome 1:** Students will be able to determine essential research topics and apply concepts related to system robotics to formulate and address an original research question.

- **Concepts:** critical thinking skills, robotics and autonomous systems, verbal and written scientific communication, real-world applicability of knowledge, research development and design, theories and methods
- **Competencies:** Students will be able to utilize learned knowledge from the program to formulate a research problem, develop a hypothesis and propose a methodology to validate and test the theory.
- **Assessment Methods:** Students will complete their prospectus document while enrolled in their research coursework. The prospectus will include a meaningful evaluation of the project they plan to achieve based on knowledge developed from their coursework and mentorship. Students will defend their prospectus, which will involve analyzing and applying critical concepts in robotics relevant to their research before an appointed committee of program faculty. The written prospectus document must include a summary of their project, a connection to the core and required classes, and demonstrate that the student can synthesize knowledge across all their courses and experiences to understand the real-world applicability. In addition, throughout the program, students will learn necessary thinking skills, ethical standards of the field, and how to work in a team setting effectively, which are crucial to being an engineer in the area of robotics and autonomous systems. The student should incorporate these skills into their presentation. The prospectus and presentation are completed by all students, generally in their second year, and will determine how well graduates analyzed the research problem, developed a hypothesis, and proposed and presented a plan to extract new knowledge. In addition, students will be evaluated on their writing skills, how well they synthesize knowledge and demonstrate critical thinking; knowledge of electrical engineering, completeness, and their ability to propose essential research that addresses their original question. Students will also complete a mid-program survey at the completion of their prospectus, providing direct information on perceptions and experiences leading up to the completion of the prospectus. In consultation with the Graduate Dissertation Committee, the Graduate Program Chair will look at average rubric scores and survey results compared to historical data as part of the program review to sustain the quality of the program.
- **Measures:** Faculty rubrics will be used to measure the student's ability to construct their prospectus based on theories, methodologies, and concepts related to system robotics learned through coursework and mentorship. A rubric will also be used to assess students' ability to successfully defend their prospectus presentation. Both the prospectus and presentation evaluation will measure the student's ability to analyze and apply critical concepts in robotics relevant to their research before an appointed faculty committee. Data from the compiled rubrics, and indirect data gathered from student mid-program surveys will be assessed for evaluation and program improvement.

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**Learning Outcome 2:** Students will be able to contextualize complex problems using mathematical and theoretical knowledge and propose solutions based on their findings.

- **Concepts:** critical topics in robotics, dynamics, control, machine learning, human-machine interaction, mathematical and theoretical knowledge
- **Competencies:** Students will be able to research and provide a solution to a complex problem using theoretical and mathematical knowledge in robotics-control systems, linear algebra, control theory, feedback systems, and artificial neural intelligence while demonstrating a broad understanding of how robotics and autonomous systems concepts are applied to solve problems.
- **Assessment Methods:** The final project in required course Robotic Systems-I and the literature review in Principles of Independent Research will be assessed to demonstrate students' ability to analyze and apply critical topics in dynamics, control, machine learning, and human-machine interaction in their research. Students will take these courses to develop the skills needed to contextualize complex problems using mathematical and theoretical knowledge. Program staff will compile the results from the project and literature review and provide it to the Graduate Program Chair for evaluation. This data will inform the Graduate Program Chair of how students are progressing in the program. In addition, for indirect assessment, the program will ask students to take the Graduate and Law Student Report Card survey to assess strength in program training, research skills and methods. The Graduate Program Chair will interpret the compiled data from the courses and the survey along with the program's faculty to determine new courses, curriculum changes, issues with the student population and how to improve the program.
- **Measures:** Faculty rubrics will be used to assess the final project in Robotic Systems-I and the literature review in Principles of Independent Research to measure student's competency in contextualizing complex problems using mathematical and theoretical knowledge, and propose solutions based on their findings. The Graduate and Law Student Report Card survey will assess the program indirectly based on students' perceptions of their preparation in research skills and methods measured on a 5-point scale, with successful performance determined if the majority respond either "strong" or "very strong" to the research skills and methods prompt. Overall, satisfactory assessment is indicated when students meet or exceed the standards based on the data from the course rubrics and the results of the survey, showing student success in the ability to contextualize complex problems using mathematical and theoretical knowledge. The program chair and faculty will review the compiled data for continuous improvement.

**Learning Outcome 3:** Students will conduct research resulting in an original contribution to knowledge in robotics and autonomous systems, and successfully communicate findings in their dissertation and defense.

- **Concepts:** methodological literacy, independent research, analysis, critical thinking, communication and presentation skills
- **Competencies:** Students will be able to utilize knowledge from coursework, research and mentorship to address their research question, validate the hypothesis, and

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execute a plan to extract new knowledge in robotics and autonomous systems resulting in the successful completion of a dissertation and defense.

- **Assessment Methods:** The comprehensive written dissertation and defense will be evaluated by a faculty committee who will assess students' ability to successfully conduct original independent research in robotics and autonomous systems, finalize their research findings, and effectively defend their dissertation. Additionally, the program will collect indirect data through evaluating student perceptions of their preparedness to conduct research and address their research question through learned knowledge based on the program's curriculum through data collection from ASU's Graduate and Law Student Report Card survey. Data from the written dissertation, defense and survey will be compiled and analyzed by the Graduate Program Chair. In consultation with the Graduate Dissertation Committee, the Graduate Program Chair will look at average rubric scores and survey results compared to historical data as part of the program review to sustain program quality.
- **Measures:** The dissertation and presentation will be assessed by faculty-designed rubrics that measure how well graduates solved the research problem, validated the hypothesis, and executed a plan to extract new knowledge in robotics, and autonomous systems. The Graduate and Law Student Report Card survey conducted by the university will assess students' research preparation in the program on a 5-point scale with successful performance determined if the majority respond either "strong" or "very strong" to the research preparation prompts. Overall, satisfactory assessment is indicated when students meet or exceed the standards based on the data from the dissertation and defense rubrics and the results of the survey showing student success in research preparation. The program chair and faculty will review the compiled data for continuous improvement.

**Projected Enrollment for the First Three Years:**

Year 1: 5

Year 2: 15

Year 3: 25

**Evidence of Market Demand:**

Robotics jobs are in high demand. The U.S. Bureau of Labor Statistics has estimated that the robotics engineer job market will grow by 30% in the next decade. The median income for the area is \$104,000. The lowest-earning 10% of the roboticists earned less than \$62,000, and the highest-earning 10% earned more than \$198,000. The Phoenix area is one of the top five areas for employment in robotics, with a mean salary of \$115,000. With major robotics and automation industries expanding their presence in Arizona, graduates should be able to find positions in the valley and contribute to the Industry 4.0 revolution. The graduates can work in autonomous ground vehicles, aerial vehicles, military drones, space robotics, semiconductor manufacturing, and automation. They can work as automation engineers, autonomous vehicle design engineers, design engineers, and factory automation engineers.  
(<https://www.onetonline.org/link/summary/17-2199.08>)



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There is an unprecedented demand for a workforce trained in advanced concepts in robotics and automation. The local industries like Intel, Nikola and Taiwan Semiconductor Manufacturing Company need researchers and scientists that can support Industry 4.0, work on the forefront of current challenges and pursue research fusing the disciplinary boundaries. This workforce needs to be highly trained with rigorous training in robotics and automation and should be able to work on problems that cannot be solved with existing knowledge. The market demand is evidenced by the local job market data obtained from the number of jobs that are currently available (from job websites like indeed.com) and salary data reported by salary.com. The U.S. Bureau of Labor Statistics puts robotics engineers in its category for mechanical engineers. The organization's projections show 9% job market growth from 2016 through 2026, The BLS expects the addition of 25,300 jobs over the forecast period.

**Similar Programs Offered at Arizona Public Universities:**

The PhD in Robotics and Autonomous Systems is not offered by any other university in Arizona.

MS Robotics and Autonomous Systems at Arizona State University – This proposed doctoral program will provide students completing the master's degree an opportunity to apply to the PhD and continue their academic pursuits.

**Objection(s) Raised by Another Arizona Public University? YES NO**

Has another Arizona public university lodged a written objection to the proposed program with the proposing university and the Board of Regents within seven days of receiving notice of the proposed program?

**If Yes, Response to Objections:**

Please provide details of how the proposing university has addressed the objection. If the objection remains unresolved, please explain why it is in the best interests of the university system and the state that the Board override it.

**New Resources Required? (i.e. faculty and administrative positions; infrastructure, etc.):**

Internal resources already allocated to Ira A. Fulton Schools of Engineering will be reallocated to launch this program and student enrollment will support growth.

**Plan to Request Program Fee/Differentiated Tuition? YES NO**

**Estimated Amount:** None

**Program Fee Justification:** N/A

**Specialized Accreditation? YES NO**

**Accreditor:** None

## EXECUTIVE SUMMARY

### Request to Establish New Academic Program in Arizona

University: Arizona State University

<b>Name of Proposed Academic Program:</b>  DEng in Engineering
<b>Academic Department:</b>  Ira A. Fulton Schools of Engineering  <i>School of Computing and Augmented Intelligence</i>
<b>Geographic Site:</b>  Tempe, West, Downtown, Polytechnic campus
<b>Instructional Modality:</b>  Immersion and online
<b>Total Credit Hours:</b>  60
<b>Proposed Inception Term:</b>  2023
<b>Brief Program Description:</b>  <p>The Doctor of Engineering (DEng) program is tailored for working professionals already possessing a science, technology, engineering and math master's degree, and who desire to advance their knowledge and leadership in engineering organizations and industries including advanced manufacturing, computing, health care, financial, information technology, data analytics, and others. Graduates of the DEng will become technology leaders in areas of disruptive new technologies such as augmented intelligence, blockchain, big data, additive manufacturing, and more. Graduates will be able to effectively apply statistical analysis and advanced disciplinary technical skills to the solution of applied problems in industry, government, research, the nonprofit sector or other domains. Furthermore, graduates will be able to lead interdisciplinary teams in the solution of pressing societal problems and to communicate those solutions to the broader community. The DEng program is ideally suited for those wishing to advance their careers through practical research-based approaches. The culminating experience will be an applied research project that will focus on technological advancement within the student's chosen area of study.</p> <p>The proposed DEng program meets the goals of Arizona State University's Charter: Our mission statement regarding "whom we include and how they succeed" is addressed by</p>

including working professionals as students who could not otherwise stop their careers to pursue a PhD degree; "advancing research and discovery of public value" is addressed by closely linking the applied research projects for the DEng students to their workplace, thus ensuring the relevance and impact of the applied research. ASU's Mission and Goals are also met through the proposed DEng program: "Demonstrate leadership in enabling academic excellence and accessibility at scale" is addressed by enabling more students to pursue doctoral-level engineering degrees; "Enhance our local impact and social embeddedness" is addressed by meeting the needs of working professionals to enhance their engineering skills through advanced graduate education.

The DEng degree is currently offered at universities such as Johns Hopkins University, the University of California at Berkeley, Texas A&M University, George Washington University, and Colorado State University.

#### **Learning Outcomes and Assessment Plan:**

**Learning Outcome 1:** Students will effectively apply statistical analysis and advanced disciplinary technical skills in formulating a solution to applied problems in industry, government, the nonprofit sector, or other domains.

- **Concepts:** probability, variability, probability distribution, hypothesis testing, regression
- **Competencies:** Students will be able to solve applied problems by analyzing probability distributions, formulating a hypothesis, testing the hypothesis and developing regression models to forecast future results.
- **Assessment Methods:** The competency of the outcome will be directly assessed based on the final projects in each of the core courses of the program which will show students' competency in effectively applying statistical analysis and advanced disciplinary technical skills in their applied research. The DEng program requires students to take core coursework in statistical analysis and advanced disciplinary technical skills so that they may build upon acquired knowledge from their professional careers and apply both to developing probable solutions to applied problems that emerge in areas such as industry, government, research, the nonprofit sector, or other domains. The faculty teaching the courses will provide the scoring data to the unit's Curriculum Committee Chair and Program Chair for review. For indirect data, the program director will collect results from ASU's Graduate and Law Student Report Card survey from questions regarding student perceptions of their skill preparedness in their ability to effectively use statistical analysis and technical skills in their applied research. The data from the core coursework results and the survey will be compiled and reviewed annually by the program director and the faculty for refinement.
- **Measures:** Faculty-designed rubrics will be used to measure how well graduates applied statistical tools (scored from 1 to 5) and how well they applied disciplinary engineering skills (also scored from 1 to 5) in formulating a solution to an applied problem in each of their core course projects. The Graduate and Law Student Report Card survey will assess the quality of the program and student readiness from the

student's perspective based on a 5-point scale. Students will be asked to evaluate whether or not they received the skills and knowledge necessary to successfully complete their program. Success will be determined based upon a majority response of "strong" or "very strong" for the skills preparation category. The compiled data from the final projects and the survey will show students' overall ability to apply statistical analysis and advanced disciplinary technical skills in formulating a solution to applied problems. Once all data has been compiled, the Graduate Program Chair, in consultation with the Graduate Program Committee, will specifically look at average rubric scores and survey results compared to historical data to continuously improve the program.

**Learning Outcome 2:** Students will demonstrate effective communication in developing and delivering applied engineering solutions to problems that impact the broader community.

- **Concepts:** applied research, solution building, understanding context, motivation, structure, audience understanding, graphics and visuals, technical writing, communication skills
- **Competencies:** Students will be able to develop and apply engineering solutions to address a pressing societal problem and deliver results to both technical and non-technical audiences.
- **Methods:** While enrolled in the final course of the program, students will draw on skills they have learned from previous coursework in the program and professional careers to develop an applied engineering solution that will address a problem that impacts the broader community. They will be required to complete a final report and deliver the contents of the report in an oral presentation to members of their committee and a technical and nontechnical audience. Students will be evaluated on their ability to communicate their engineering solution from a position of leadership, how well they are able to convey their findings to both technical and nontechnical audiences, and their ability to deliver the results in a clear and confident manner. Faculty will evaluate students' presentations and provide overall results to the Curriculum Committee Chair and Program Chair for review. In addition, indirect data from the Graduate and Law Student Report Card survey will be used as a resource to quantify the student's own assessment of their preparedness in the program in developing the skills to present their creative solution from a position of leadership. The results from the presentations as well as the survey data will be used to review the program annually for improvement.
- **Measures:** A faculty-developed rubric (scored 1 to 5) will be used to measure how well the student is able to communicate their applied engineering solution that addresses a pressing societal problem through the applied project presentation. The Graduate and Law Student Report Card survey will quantify the student's own assessment of how they have effectively applied the communication skills acquired through completion of the program. Success will be determined based upon a majority response of "strong" or "very strong" for the public speaking and presentation skills preparation category of the survey. The Graduate Program Chair will compile the data, and in consultation with the Graduate Program Committee, will specifically look at average rubric scores and survey results compared to historical data to continuously improve the program.

**Learning Outcome 3:** Students will have the expertise to lead engineering and technology enterprises in the design and development of innovative solutions to an applied multi-context problem with consideration of public health, safety, sustainability, and welfare, as well as global, cultural, social, environmental and economic factors.

- **Concepts:** problem solving, strategic thinking, emotional intelligence, creativity, consideration of nontechnical factors
- **Competencies:** Students will be able to apply engineering leadership skills including problem-solving, strategic thinking, emotional intelligence, and creativity to the solution of multi-context problems with consideration for non-technical aspects including public health, safety, sustainability, economic and other factors.
- **Assessment Methods:** After completing the final applied project, students will complete a final written report that will be used to evaluate their expertise in leading engineering and technology enterprises using innovative solutions of their own design from their individual professional experience, as well as knowledge learned in the program and from their faculty mentorship, to solve an applied multi-context problem. The written report will be evaluated by a faculty committee who will assess students' ability to successfully conduct original independent applied research in engineering, finalize their research findings, and effectively communicate their innovative solutions with consideration of public health, safety, sustainability, and welfare, as well as global, cultural, social, environmental, and economic factors. In addition, the written report will show students' overall ability to solve applied problems by analyzing probability distributions, formulating a hypothesis, testing the hypothesis, and developing regression models to forecast future results. For indirect evaluation, the results of a Graduate Alumni Survey will be used approximately three years after graduation and will quantify the success of program graduates within their professional career. Survey results and assessment information will be reviewed annually for improvement to maintain program quality.
- **Measures:** A faculty-designed rubric will be used to record results for the applied doctoral project written report designed to measure students' facility in designing and developing innovative solutions in leading engineering and technology enterprises to solve an applied multi-context problem. For example, students will be measured on how well graduates apply engineering leadership tools (scored from 1 to 5), and how well they address nontechnical factors (also scored from 1 to 5) in their written project report. Higher results will show competency in the tools needed to design and develop innovative solutions to lead engineering and technology enterprises. In addition, this rubric will quantify how the student, near the point of graduation, is able to apply leadership skills to provide expertise and recommendations, with due consideration for societal, health, and other nontechnical aspects in designing and implementing their solutions. In addition, the Graduate Alumni Survey, gathered approximately 3 years after graduation, will have a series of questions that measures the student's own assessment regarding their program preparation. Graduates will have an opportunity to show how they have utilized the skills and mentorship acquired throughout the program in their career as graduates with post-graduation professional experience. Satisfactory assessment is indicated when students meet or exceed standards based on data from the applied project written report rubrics and the results

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of the survey. Once all data has been compiled, the Graduate Program Chair, in consultation with the Graduate Program Committee, will specifically look at average rubric scores and survey results compared to historical data to continuously improve the program.

### **Projected Enrollment for the First Three Years:**

Year 1: 10  
Year 2: 30  
Year 3: 50

### **Evidence of Market Demand:**

The U.S. Bureau of Labor Statistics reports that employment for postsecondary engineering teachers, which requires a doctoral degree, is projected to grow "faster than average" from 2020 to 2030 (<https://www.bls.gov/ooh/occupation-finder.htm?pay=&education=Doctoral+or+professional+degree&training=&newjobs=&growth=&submit=GO>). Furthermore, for the job category of "architectural and engineering managers," which is anticipated to be a major focus of the DEng program, the bureau projects a growth rate of 4% through 2030, starting from a base number of 197,800 jobs in 2020 (<https://www.bls.gov/ooh/management/architectural-and-engineering-managers.htm>).

Additional data for the career outlook for DEng graduates are difficult to come by, but US News & World Report has written "Getting either a master's degree or doctorate in engineering can lead to higher salaries, specialized skill development and career advancement" (<https://www.usnews.com/education/best-graduate-schools/articles/hot-jobs-for-engineering-graduate-degrees>), while the website <https://bestaccreditedcolleges.org> provides a general overview of Doctor of Engineering degrees, where they report "Doctor of Engineering programs provide students with knowledge and skills related to advanced engineering techniques, including design and various technologies. These programs differ from Doctor of Philosophy programs in that they prepare graduates to practice engineering, rather than perform research in an academic environment" (<https://bestaccreditedcolleges.org/articles/doctor-of-engineering-general-engineering-degree-overview.html>).

The online DEng in Engineering Management offered by George Washington University had 85 graduates in 2018, according to the American Society of Engineering Education. This represents an increase from only 14 graduates the previous year.

In addition to market demand, the Fulton Schools of Engineering has a compelling interest to strengthen collaborations with local, national, and international industries, and to increase the number of doctoral graduates. The proposed DEng is anticipated to lead to improved connections with industry, because of the students who are expected to be full-time employees while pursuing the DEng degree. Such full-time employees are generally not available to participate in our PhD programs because of their work/family obligations. The proposed online DEng degree will therefore increase the number of prospective engineering doctoral students, and in turn beneficially impact our graduate program rankings which are

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based in part on the number of doctoral graduates.		
<b>Similar Programs Offered at Arizona Public Universities:</b>  There are no online engineering doctoral programs at the University of Arizona (UA), nor at Northern Arizona University (NAU).  Outside of engineering, comparable programs include the online Doctor of Education degree at ASU, the online Doctor of Education at UA, the online Doctor of Behavioral Health at ASU, and the online Doctor of Nursing Practice at UA. A Doctor of Professional Practice in Global Leadership and Management was recently established by the ASU Thunderbird School of Global Management. In all cases, these doctoral degrees are meant to appeal to working professionals, rather than to the classic in-person doctoral student.		
<b>Objection(s) Raised by Another Arizona Public University?</b> YES      NO Has another Arizona public university lodged a written objection to the proposed program with the proposing university and the Board of Regents within seven days of receiving notice of the proposed program?  <b>If Yes, Response to Objections:</b> Please provide details of how the proposing university has addressed the objection. If the objection remains unresolved, please explain why it is in the best interests of the university system and the state that the Board override it.		
<b>New Resources Required? (i.e. faculty and administrative positions; infrastructure, etc.):</b>  Internal resources already allocated to Ira A. Fulton Schools of Engineering will be reallocated to launch this program and student enrollment will support growth.		
<b>Plan to Request Program Fee/Differentiated Tuition?</b> YES      NO  <b>Estimated Amount:</b> \$3,618 per semester  <b>Program Fee Justification:</b> \$3,618 is the current program fee charged for online master of engineering students. The fee for this program supports the academic advising and instructional needs for the proposed program.		
<b>Specialized Accreditation?</b> YES      NO  <b>Accreditor:</b> None		

## EXECUTIVE SUMMARY

### Request to Establish New Academic Program in Arizona

University: Arizona State University

<b>Name of Proposed Academic Program:</b>  Doctor of Information Technology (DIT) in Information Technology
<b>Academic Department:</b>  Ira A. Fulton Schools of Engineering  <i>The Polytechnic School</i>
<b>Geographic Site:</b>  Tempe, West, Downtown, Polytechnic campuses
<b>Instructional Modality:</b>  Immersion and online
<b>Total Credit Hours:</b>  69
<b>Proposed Inception Term:</b>  2023
<b>Brief Program Description:</b>  <p>The Doctor of Information Technology is tailored for working professionals already possessing a master's degree in a science, technology, engineering and math field who have decided to advance their knowledge and leadership in advanced technology to support organizations and industries. DIT graduates will be technology leaders who will learn the skills required to lead enterprise initiatives that innovate highly reliable communications networks, implement resilient security global systems, and leverage data analytics in daily big data business decisions.</p> <p>In alignment with the ASU's charter, the program provides opportunities for students to use their knowledge and experience to participate in practical, doctoral-level, research-based projects. Information technology has the advantage of being multidisciplinary and promotes crossdisciplinary projects that focus on the New Economic Initiative and sustainability-related research. The program focuses on providing the right innovative solution that balances technology, people, and processes to innovate solutions that increase economic prosperity and growth, which, in turn, creates multi-faceted and positive changes in our communities.</p>



**Learning Outcomes and Assessment Plan:**

**Learning Outcome 1:** Students will integrate theories and concepts of information technology in their applied research, focusing on their specific industry.

- **Concepts:** concepts of information technology, including, data science, network and cybersecurity, information system development, and leadership responsibilities of ethical, legal, and regulatory concerns
- **Competencies:** Students will be able to identify information technology concepts, articulate and critique prevailing principles of information technology, and demonstrate critical thinking about multidimensional interconnections of complex developmental challenges in their applied research that can be integrated in their industry profession.
- **Assessment Methods:** The Doctor of Information Technology program requires students to take core courses in advanced knowledge of information technology to ensure that they can integrate theories and concepts of information technology in their applied research. The competency of the outcome will be assessed based on the final projects in each of these core courses. The faculty teaching the core courses will provide the scoring data to the Curriculum Committee Chair and Program Chair for review. The data will be analyzed to specifically look at average rubric scores compared to historical data. For direct measures, all students who completed the core courses will receive a survey created by the Program Chair and Graduate Program Committee. The survey process will use a survey platform so that the student can stay anonymous. The students will be asked about their preparedness to demonstrate critical thinking about multidimensional interconnections of complex developmental challenges in their current or future employment. The data from the surveys and student scores will be analyzed annually by the Program Chair and Graduate Program Committee.
- **Measures:** Faculty teaching the core courses will assess students' understanding of the theories and concepts of information technology in their applied research using a faculty generated rubric for the final projects that students can in turn use in their industry career. The rubrics will measure how well the students demonstrate their technical and nontechnical skills (scored 1 to 5). The survey sent to students who finished the core courses will measure student preparedness to demonstrate critical thinking about multidimensional interconnections of complex information technology developmental challenges in their current or future employment. The survey data will be compiled, collected, and stored by the Curriculum Committee Chair and analyzed to specifically look at average rubric scores compared to historical data. The data from the final project rubrics and surveys will be analyzed in the same way. Annual review of outcomes will allow opportunities for continuous course improvement and refinement.

**Learning Outcome 2:** Students will develop an applied technology solution that addresses real industry-specific problems using transdisciplinary research in their final project.

- **Concepts:** applied technology, methods, theories, principles across many technical areas of data science, transdisciplinary research principles, networking and cybersecurity

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- **Competencies:** Students will demonstrate the ability to analyze big data, establish business intelligence analytics, build statistical models, secure cloud network infrastructure, and use transdisciplinary research principles.
- **Assessment Methods:** Students enrolled in the Doctor of Information Technology program will be required to take a methods course with a final project that includes an analysis of an applied technology solution that addresses a real industry-specific problem using transdisciplinary research principals. In their final project for the methods course, students will be required to choose and apply relevant quantitative and computational methods to answer research questions about information technology systems. The project will be scored to show facility in methods, theories, principles, and knowledge of networking and cybersecurity required to develop the applied technology solution. Knowledge learned from the methods course and the completion of the final course project will prepare students to complete a written report as part of their applied technology solutions project that is the culminating experience for the program. Students will be assessed in their ability to develop an applied technology solution that addresses a real industry-specific problem in the written report. The evaluation of the written report will be scored to demonstrate students' integrative understanding and use of analyzing big data, establishing business intelligence analytics, building statistical models, and maintaining a secure cloud network infrastructure, as presented. The faculty chairs will compile recorded data from the final projects for the methods course and the written report from the applied technology solutions projects and provide it to the program director who will evaluate patterns in the data. Results from the evaluation will be shared with the program faculty and used for continuous improvement of the curriculum.
- **Measures:** Faculty-developed rubrics (scored 1 to 5) will be used to measure students' competency in big data, business intelligence analytics, statistical models, secure cloud network infrastructure and in the use of transdisciplinary research principals required to develop applied technology solutions that address real industry-specific problems. The data from the final projects for the methods course and the applied technology solutions project rubrics will be analyzed yearly by the Program Chair and Curriculum Committee to compare average rubric scores to historical data. Annual review of outcomes will allow opportunities for refinement.

**Learning Outcome 3:** Students will effectively disseminate their multidisciplinary applied technology solution project results to peers and colleagues in a final presentation with oral defense.

- **Concepts:** complex multidisciplinary information technology theories and principles including data science, network and cybersecurity, information system development, and leadership responsibilities (ethical, legal, regulatory); applied research methodology; analysis; communication
- **Competencies:** Students will be able to present their applied technology solution project findings orally and in writing to technical and non-technical professional audiences.

- **Assessment Methods:** Students enrolled in the Doctor of Information Technology are required to present their findings in an open defense to a faculty panel comprised of their faculty chair, knowledgeable researchers and industry experts of their applied research topic. The presentation will allow students to show their ability to synthesize key approaches and methods to design and develop an applied technology solution as well as include a demonstration of their solution. Faculty chairs will collect and compile feedback for the program chair which will be reviewed annually for continuous quality improvement. Students who have completed the Doctor of Information Technology will also be sent a post-program survey created by the Program Chair and Graduate Program Committee. The survey process will use a survey platform so the students can remain anonymous. Graduates will be asked about their preparedness to demonstrate critical thinking about multidimensional interconnections of complex developmental challenges in their current or future employment and in developing a multidisciplinary applied technology solution. The data from the surveys and student scores will be analyzed annually by the Program Chair and Graduate Program Committee for continuous quality improvement.
- **Measures:** Faculty-developed rubrics (scored 1 to 5) will be used to measure students' ability to effectively disseminate their multidisciplinary applied technology solution project results in their presentation and defend their results in an open oral defense, as well as the demonstration of their applied technology solution. The survey sent to students who completed the program will measure student preparedness to demonstrate critical thinking about multidimensional interconnections of complex developmental challenges in their current or future employment and develop a multidisciplinary applied technology solution. The survey data will be compiled, collected, and stored by the Curriculum Committee Chair and analyzed to specifically look at average rubric scores compared to historical data. The data from the presentation/defense rubrics and survey will be analyzed yearly by the Program Chair and Curriculum Committee to specifically look at average rubric scores compared to historical data. Overall, satisfactory assessment is indicated when students meet or exceed the standards based on the data from the presentation and defense rubrics and the results of the survey showing student success in preparation. Annual review of outcomes will allow opportunities for continuous course improvement and refinement.

**Projected Enrollment for the First Three Years:**

Year 1: 10

Year 2: 30

Year 3: 50

**Evidence of Market Demand:**

Other universities have started offering a Doctor of Technology to meet the market demand: Purdue University, Polytechnic Institute has an online Doctor of Technology, Capella University, City University of Seattle, and Walden University. Doctor of Science (SCD) or Doctor of Philosophy (PhD) focusing on information technology are offered from Towson University, George Mason University, University of Cumberlands, and University of Nebraska at Omaha.

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The Information Technology Industrial Advisory Board strongly supports the concept of developing a doctoral program in information technology with a focus on applied technology. The advisory board sees growth and the need for this skill set within industry. According to the Bureau of Labor Statistics, jobs in the information technology industry are growing well above the average rates of all other occupations. The bureau expects growth to be around 11% from 2019 to 2029. The bureau predicts that the IT industry will add over 530,000 new jobs by 2029. These occupations are high-paying with an annual median salary of close to \$90,000 in May 2019, and this value is expected to reach over six figures in the early 2020s. The annual rate of compensation is more than twice the median wage for all jobs in the U.S.

Arizona's diverse economy includes manufacturing of technological, electronic, aerospace, transportation, food and service industries. The profound economic impact of these industries has been recognized by the Arizona Department of Commerce in their economic report of the advanced communication and information technology (AC-IT) industry. AC-IT related jobs pay 75% more than the average state salary, and account for more than 9% of the total employment in the private sector in AZ. Furthermore, the AC-IT industry accounted for over \$6B in Arizona foreign exports out of a total export of \$11B.

In addition to market demand, the Fulton Schools of Engineering has a compelling interest to strengthen collaborations with local, national and international industries, and to increase the number of doctoral graduates. The DIT is anticipated to lead to improved connections with industry, because of the students who are expected to be full-time employees while pursuing the DIT degree. Such full-time employees are generally not available to participate in our PhD programs because of their work/family obligations. The DIT degree will be offered online and onsite to increase the number of prospective engineering doctoral students, and, in turn, beneficially impact our graduate program rankings which are based in part on the number of doctoral graduates.

**Similar Programs Offered at Arizona Public Universities:**

No state university in Arizona offers both a master's degree and a doctoral degree in Information Technology from an engineering program. There are no online or on-campus engineering doctoral programs at University of Arizona (UA), or Northern Arizona University (NAU).

However, there is an on-campus program at UA from the School of Information, from College of Social and Behavioral Sciences, that focuses on behavior and related human factors across sectors of life, to include economic or business contexts, education, health and art. The difference is that the DIT program builds a comprehensive view of information technology that includes cloud infrastructure, data storage and retrieval models, data analytics with machine learning and data mining techniques, cybersecurity, ethics, project management and leadership. This makes the DIT program different because of its encompassing scope and focus on application for the whole information technology discipline.

Northern Arizona University

- MS in Computer Information Technology
- PhD in Informatics and Commutating

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The DIT is a professional doctorate designed to enhance the knowledge, credentials, and stature of industry professionals by increasing their information technology knowledge, leveraging their work experience, and enhancing their skills to lead organizations through the optimization of academic theory, applied engineering, and individual successes. The DIT focuses on combining applied research, industry practices and leadership to innovative solutions to complex multi-faceted industry challenges. The emphasis on leadership, applied engineering, and industry experience is a key difference between the DIT and other doctoral programs which tend to prepare students for careers in research and development.

**Objection(s) Raised by Another Arizona Public University?** YES NO

Has another Arizona public university lodged a written objection to the proposed program with the proposing university and the Board of Regents within seven days of receiving notice of the proposed program?

**If Yes, Response to Objections:**

Please provide details of how the proposing university has addressed the objection. If the objection remains unresolved, please explain why it is in the best interests of the university system and the state that the Board override it.

**New Resources Required? (i.e. faculty and administrative positions; infrastructure, etc.):**

Internal resources already allocated to Ira A. Fulton Schools of Engineering will be reallocated to launch this program and student enrollment will support growth. Additional faculty will be required as the program grows, to be identified through the planning process in collaboration with the dean's office.

**Plan to Request Program Fee/Differentiated Tuition?** YES NO

**Estimated Amount:** None

**Program Fee Justification:** N/A

**Specialized Accreditation?** YES NO

**Accreditor:** None

## EXECUTIVE SUMMARY

### Request to Establish New Academic Program in Arizona

University: Arizona State University

<b>Name of Proposed Academic Program:</b>  MS in Clean Energy Systems
<b>Academic Department:</b>  Ira A. Fulton Schools of Engineering  <i>The Polytechnic School</i>
<b>Geographic Site:</b>  Tempe, West, Downtown, Polytechnic campus
<b>Instructional Modality:</b>  Immersion and Digital Immersion
<b>Total Credit Hours:</b>  30
<b>Proposed Inception Term:</b>  2023
<b>Brief Program Description:</b>  <p>The MS in Clean Energy Systems is designed to provide students with the skills required to have an in-depth understanding of – and subsequent careers within – energy systems, automotive systems, and autonomous transportation. In support of the university mission, this program is pursued in an environment that values the individual strengths and diversity of our students, and in which students are provided opportunities to serve and learn in the surrounding community. This program aims to educate engineers in promoting and establishing new and renewable energy sources for reducing carbon footprint and to maintain program accessibility to match Arizona’s socioeconomic diversity, with undifferentiated outcomes for success.</p> <p>This MS program will have several components: classroom teaching, applied research on fuel cells, power electronics, batteries, automotive systems, renewable energy systems including solar photovoltaics, wind power etc., including system development and evaluation, along with public outreach (including community colleges and minority universities). This program is designed to motivate students to learn through classroom teaching and hands-on laboratory experiments. The applied courses within the program will provide exposure to different disciplines, including electrical and electronics engineering, mechanical engineering, chemical</p>

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engineering, chemistry, and physics. The project-oriented courses will emphasize various skills related to practice, verbal communication and presentation skills, project management, teamwork, and quality deliverables. The program intends to attract full-time students, and also professionals from local energy industries. The program aims to generate reliability engineers, experimentalists, production managers, process engineers, analysts, system designers, system integrators, and technology managers.

**Learning Outcomes and Assessment Plan:**

**Learning Outcome 1:** Students will apply core thermodynamic energy concepts to address a research question regarding clean energy system performance and reliability.

- **Concepts:** Batteries, fuel cells, solar photovoltaic systems, power electronics, connected and automated vehicles system development, fundamental system configuration underlying core behaviors, common operating conditions affecting the performance and reliability of the clean energy system
- **Competencies:** Students will be able to use core concepts such as operating principles of clean energy systems; batteries, fuel cells, solar photovoltaic systems, power electronics, connected and automated vehicles system; typical technical approaches and model systems to evaluate systems performance and notable operating conditions affecting the energy system to address a research question.
- **Assessment Methods:** Students are required to take core courses Advanced Engineering Analysis, and Principles of Systems Engineering in their first year of enrollment. These courses will require students to complete a written research paper and a primary manuscript presentation on a topic related to a specific clean energy system answering a research question with instructor guidance. The evaluation of these assignments will show competency in students' ability to apply core energy concepts to address a research question regarding system performance and reliability. The course instructor will provide assignment results to the Graduate Program Chair and the Executive Committee as part of the graduate program's annual review. The Graduate Program Chair and the Executive Committee will work together to refine course materials and assignments for continuous improvement of the curriculum.
- **Measures:** Faculty-developed rubrics created by the instructors and graduate program chair in consultation with the executive committee will be used to evaluate student performance on the two required assignments completed in the core courses – a research paper and a primary manuscript presentation. The rubrics will focus on the students' understanding of core concepts noted above and the ability to address a research question regarding clean energy system performance and reliability. Students will be assessed on a 3-point scale (1=highest) with successful performance determined if the majority respond at the highest level. Overall, satisfactory assessment is indicated when students meet or exceed the standards based on the data from the research paper and a primary manuscript presentation rubric. Annual review of outcomes will allow opportunities for continuous course improvement and refinement.

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**Learning Outcome 2:** Students will effectively communicate clean energy systems concepts through scientific presentation.

- **Concepts:** public speaking, scientific presentation preparation, data production and visual representation, peer communication skills and practices
- **Competencies:** Students will be able to effectively contextualize their research in typical presentation formats, prepare and present a PowerPoint presentation based on their energy systems research results, exhibit an ability to discuss and defend concepts, and professionally address questions related to their research and presentations.
- **Assessment Methods:** Students will be evaluated on their ability to effectively communicate clean energy system concepts in three graded presentations. All students will take Systems Engineering as a required course in the first year where they will be required to present their research to the course instructor and class. In addition, students are required to prepare and present a research proposal to their advisory committee/primary mentor by the end of the first year of the program, for evaluation by the advisory committee. The students' speaking and presentation skills at the oral public defense of their thesis will be rated and scored by the primary mentor and advisory committee. This approach will provide longitudinal data during distinct stages of the program which will allow for a clear assessment of trajectory in evaluating students' ability to effectively communicate energy systems concepts. The research instructor, primary mentor, and advisory committees will share data with the graduate program chair and the executive committee to improve training efforts and speaking skill development within the curriculum.
- **Measures:** Faculty-designed rubrics will be used to evaluate students' ability to effectively communicate clean energy systems concepts in each of the presentations. The rubric for the energy systems course will be developed by the instructor and the graduate program chair in consultation with the executive committee. Students will be rated on a scale of 1-3 (1=highest) by the instructor. The primary mentor and advisory committee will also rate the student on their ability to prepare and present their research proposal, then subsequently effectively communicate clean energy systems concepts during their public thesis defense at the end of the second year of the program on a scale of 1-3 (1=highest). Overall, satisfactory assessment is indicated when students meet or exceed the standards based on the data from the presentation rubrics. Annual review of outcomes will allow opportunities for continuous course improvement and refinement.

**Learning Outcome 3:** Students will conduct independent research including strategizing experimental/scientific objectives, analyzing data, designing experiments, and reviewing scholarly literature, related to various clean energy systems.

- **Concepts:** common experimental model systems, techniques to study the experimental system, basic statistics, experimental design, operating in team-based environments, goal setting, task planning, understanding of professional and ethical responsibilities



- **Competencies:** Students will have the ability to evaluate primary literature and understand typical methodologies, interpret associated results, explain the advantages and disadvantages of commonly used techniques to address their hypothesis, and work with the primary advisor/advisory committee to design an experiment that tests a hypothesis related to clean energy systems as well as function efficiently in teams to achieve experimental goals.
- **Assessment Methods:** Students will identify a primary thesis chair/mentor and form an advisory committee in the first semester of training who will guide them through the research process. Students' independent research plan and project will then be developed in consultation with the mentor and the advisory committee. The students' research capabilities, including their ability to strategize experimental/scientific objectives, analyze data, design their experiment, and use scholarly literature, will be evaluated through their written thesis and public thesis defense at the end of their program. Results and analysis will be shared with the graduate program chair and executive committee, and will be used for designing additional improvements to the program.
- **Measures:** Faculty-designed rubrics will be used to evaluate students' ability to conduct independent research, including evaluating clean energy systems literature, understanding of typical methodologies, interpreting associated results, and explaining the advantages and disadvantages of commonly used techniques to address their hypothesis in their description of research summary, written thesis, and oral defense. Each faculty-designed rubric will include a reporting scale of 1-3 (1=highest) completed by their primary mentor and advisory committee. The thesis results will be submitted on a thesis defense form to the school graduate programs office for recording. The Clean Energy Systems' graduate program chair and the executive committee will review the results to refine curricular features meant to enhance student performance.

**Projected Enrollment for the First Three Years:**

Year 1: 25

Year 2: 35

Year 3: 50

**Evidence of Market Demand:**

Engineering workforce development in clean energy is one of the essential components in meeting the 21st century's clean energy demand. According to U.S. Bureau of Labor Statistics (BLS), the green jobs in five categories are (i) Scientific Research, (ii) Power Engineering, (iii) Manufacturing, (iv) Plant Design/Development and (v) Plant Construction. The program's goal is to generate engineering graduates in three main areas such as alternative/renewable energy technologies, power engineering and system integration, and power management by leveraging existing courses along with the hands-on laboratory components. The U.S. Energy Information Administration indicates that 11% of the primary energy consumption in 2019 came from renewable energy sources. Considering the exponential growth of the renewable energy industry, it is imperative to generate engineering graduates specialized in renewable energy technologies, systems and management. The Solar Foundation predicts that while the solar industry is on a trajectory to reach 400,000 solar jobs by 2030, employment will need to exceed 900,000 workers by 2035 to reach the

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100% clean electricity goal set by President Biden.” According to BLS, the median salary for the green energy engineers is 95.1K per year. There were 35,018 total job postings from October 2020 to October 2022 on Solar and Wind Energy Systems Engineers, Fuel Cell Engineers alone as per Emsi Burning Glass (Lightcast) Q4 2022.

According to Emsi Burning Glass (Lightcast) Q2 2021 Data Set, the posted occupations during April 2019 to April 2021 total more than 77,000 job postings in the following categories of Energy Engineers (63,549), Wind Energy Project Managers (7,289), Solar Energy Installation Managers (2,968), Solar Energy Systems Engineers (1,868), Wind Energy Engineers (1,375) and Fuel Cell Engineers (174) and so on. The Median Advertised Salary in the above jobs is \$82.8K with major job markets in California, New York, Texas, Massachusetts, and Colorado. More than 20% of the unique job postings required a master's degree for various categories listed above.

**Similar Programs Offered at Arizona Public Universities:**

University of Arizona and Northern Arizona University do not offer any programs similar to the “Clean Energy Systems” degree described here.

**Objection(s) Raised by Another Arizona Public University? YES NO**

Has another Arizona public university lodged a written objection to the proposed program with the proposing university and the Board of Regents within seven days of receiving notice of the proposed program?

**If Yes, Response to Objections:**

Please provide details of how the proposing university has addressed the objection. If the objection remains unresolved, please explain why it is in the best interests of the university system and the state that the Board override it.

**New Resources Required? (i.e. faculty and administrative positions; infrastructure, etc.):**

Internal resources already allocated to Ira A. Fulton Schools of Engineering will be reallocated to launch this program, and student enrollment will support growth.

**Plan to Request Program Fee/Differentiated Tuition? YES NO**

**Estimated Amount:** None

**Program Fee Justification:** N/A

**Specialized Accreditation? YES NO**

**Accreditor:** None

## EXECUTIVE SUMMARY

### Request to Establish New Academic Program in Arizona

University: Arizona State University

<b>Name of Proposed Academic Program:</b>  MS in Indigenous Placekeeping and Design
<b>Academic Department:</b>  Herberger Institute for Design and the Arts  <i>The Design School</i>
<b>Geographic Site:</b>  Tempe, West, Downtown, Polytechnic campus
<b>Instructional Modality:</b>  Immersion and online
<b>Total Credit Hours:</b>  30
<b>Proposed Inception Term:</b>  2023
<b>Brief Program Description:</b>  <p>The MS in Indigenous Placekeeping and Design provides students with the skills to investigate resiliency through Indigenous worldviews, living systems, and the built environment. Students will employ innovative methods of communication and analysis to challenge exclusive preconceptions. It builds on an initiative started in 2016: The Indigenous Design Collaborative (IDC), a not-for-profit within Arizona State University Foundation, aimed at reimagining the built environment through a lens of Indigenous ways of knowing, doing and being. The vision is to prepare the next generation of designers to act as field transformation ambassadors through the power of place, design and cultures-based innovation. The mission is to increase understanding, inclusiveness, and accuracy in the field while illuminating under-examined ancestral worldviews and value systems that have the potential to contribute to global and societal transformation.</p> <p>In 2022, the pandemic has exposed not only socioeconomic disparities, but geographic and racial ones. When viewed alongside emerging global urgencies, such as climate change and lack of affordable housing, research shows inequities to be exacerbated. As status quo processes continue to be challenged, pathways open for examining other ways of being, knowing and doing. Philosophies, frameworks, and systems that center on collective values;</p>

recognize the interconnectivity of the living world; place value on non-monetary capitals (people, nature, relationships, knowledge, governance and ethics); and examine ways to engage underutilized capitals may provide the necessary injection of innovation required to ignite systems transformation. While architecture and construction appear to be functional pursuits, only offering shelter or infrastructures, the built environment – buildings, parks, roads and energy systems – are a lens to examine the world and the views of those within.

This program folds into the mission and vision of the Indigenous Design Collaborative, providing a space for those curious about Indigenous design and how they can work with the Indigenous nations to resolve larger issues. All students will be incorporated into the collaborative as community partners and creative strategists, with a culminating experience focused on ongoing projects underway with the collaborative. With many global institutions searching for ways to satisfy the increased need for a diversity-focused curriculum, the Indigenous Design Collaborative, who this program will be working with on the culminating experience, offers a rich host for examining ancestral worldviews and value systems as a pathway to global transformation.

The MS in Indigenous Placekeeping and Design coursework and work within the Indigenous Design Collaborative addresses a number of ASU's design aspirations to leverage our place, transform society, fuse intellectual disciplines, value entrepreneurship, be socially embedded, conduct use-inspired research and engage globally.

#### **Learning Outcomes and Assessment Plan:**

**Learning Outcome 1:** Students will be able to interpret research and literature to come to evidence-based conclusions in their coursework and project work.

- **Concepts:** interpreting literature and research, building technical and conceptual skills, understanding the field of Indigenous design as it relates to theory, representation, history and methodologies
- **Competencies:** Students will be able to utilize professional research databases to locate relevant peer-reviewed research articles, analyze literature findings using learned theory and methodologies in the field of Indigenous design, and interpret research while solving problems with evidence-based conclusions.
- **Assessment Methods:** Students are required to make jury presentations of their research findings at the end of each of four semesters. The presentations will be evaluated to show students' competency in interpreting research and literature to develop evidence-based conclusions in their work. The jury presentations will be evaluated by faculty from areas such as architecture, planning, construction and American Indian studies with the jury determining whether the concept proposal meets the program's curricular standards. As part of each presentation, students will submit a visual and textual design report that will also be reviewed by faculty for evaluation of student's competency in the outcome. Each semester the course instructors will provide the program director with progress data from the presentations and the visual and textual design reports. The program director and the faculty will review the results annually to drive continuous program improvement.

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- **Measures:** Faculty-designed rubrics will be used to measure the students' ability to interpret research and literature, and to communicate their findings in the program will be continuously refined based on the results.

**Learning Outcome 2:** Students will be able to demonstrate mastery of the process of Indigenous Placekeeping and Design to develop individual and community-level interventions in Nation Building.

- **Concepts:** Indigenous design methodologies, contemporary representation of Indigenous cultures, history, theory, and cultural competency in the field of design.
- **Competencies:** Students will be able to apply knowledge obtained from the program to evaluate and interpret data from discipline-specific literature, manage supporting resources, utilize peer-reviewed research articles to integrate Nation Building strategies into the design process, and utilize data in combination with community design dialogue with their clients to develop individual and community-level interventions in Nation Building.
- **Assessment Methods:** Students of the MS program will complete a final jury presentation in their last semester which will be evaluated by a faculty committee to assess students' competency of the process of Indigenous Placekeeping and Design. As part of the presentation, students will submit a final visual and textual design report to be reviewed by faculty that will include Indigenous design methodologies, contemporary representation of Indigenous cultures, history, theory, and cultural competency in the field of design. The instructors will compile data from the completed final juries yearly, which will then be provided to the degree director for annual review. The data will be evaluated to assess students' overall understanding of the Indigenous Placekeeping and Design process as it pertains to individual and community-level interventions in Nation Building. Based on the results of the compiled data, the director and faculty committee will work together to continuously improve the program.
- **Measures:** Faculty-designed rubrics will be used to assess the student's ability to successfully present their design process in Indigenous Placekeeping and Design at a mastery level using Indigenous design methodologies, while incorporating representation of contemporary Indigenous cultures, history, theory, and cultural competency in the field of design. Students will also be measured by their ability to produce a visual and textual design report showing competency in developing individual and community-level interventions in Nation Building. A committee of three or more architecture, planning, construction and American Indian studies faculty members will determine if each adequately applies Indigenous Placekeeping and Design as indicated in the curricular rubrics. Data will be shared with faculty and used to guide program revisions.

**Learning Outcome 3:** Students will successfully apply key skills, knowledge, and Indigenous methodologies toward the creation of new projects completed in service of tribal nations and partner organizations (schools, arts organizations, government entities, or other relevant partners).

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- **Concepts:** theoretical, cultural, and historical understandings of design, knowledge development as a synthesis of learning including history, contemporary issues, tribal aims, engagement, service learning, design methods, application of Indigenous pedagogies, and theoretical and community-based immersion experiences
- **Competencies:** Students will be able to apply relevant learnings toward the creation of new projects in collaboration with partners, in addition to conceive, plan, and implement new models for practice in collaboration with tribal nations, arts organizations and other partners working in service of tribal clients.
- **Assessment Methods:** Students complete an applied project in service of tribal nations and partner organizations, which will be evaluated by the faculty committee, showing competency in their ability to apply key skills, knowledge, and Indigenous methodologies in their work. As part of the applied project, students will submit a visual and textual design report that will also be reviewed by the committee that will show their competency in the concepts listed above. In addition, students complete a required professional service-learning internship supervised by a professional practitioner in an appropriate field based on the students' area of study that they will be evaluated on. Each semester the instructors will share the results of the applied project, visual and textual design report, and internship evaluation with the program director and faculty who will work together to refine course materials for continuous program improvement based on the final review.
- **Measures:** Faculty-designed rubrics will be used to determine students' ability to successfully apply key skills, knowledge, and Indigenous methodologies toward the creation of new projects in service of tribal nations and partner organizations. Faculty from architecture, planning, construction and American Indian studies, including invited internship supervisor practitioners, will score the students based on the rubrics and determine if each student has demonstrated competency. Satisfactory performance is indicated when the students meet or exceed the standards based on the rubrics. Data from the rubric scores will be used for continuous improvement.

### Projected Enrollment for the First Three Years:

Year 1: 25  
Year 2: 40  
Year 3: 60

### Evidence of Market Demand:

The proposed program aims to address the lack of diversity in the field of architecture. The Association of Collegiate Schools of Architecture (ACSA) examined admission numbers of Indigenous people in architecture and found "miniscule enrollment numbers at NAAB-accredited schools"... (with) 63% percent, or 87 of the 139 programs reporting no enrolled Indigenous students. (<https://www.acsa-arch.org/resource/where-are-my-people-native-indigenous-in-architecture/>)

With the recent focus on diversity, equity, inclusion and justice initiatives, architecture and construction firms within the Pacific Southwest are turning to universities to learn more about

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how to work with and learn from Indigenous Nations in efforts to enhance their values and inclusion. With the recent growth in employment within the construction sectors in Arizona alone (3.8%, February 2022, U.S. Bureau of Labor Statistics), the need for a more inclusive industry calls for employees with training in diversity and cultural specializations. This program will provide such training.

The program will help ASU grow the pipeline of students coming to ASU, both Indigenous and non-Indigenous. Currently, there are “nearly 3800 self-identified Indigenous students at ASU, an increase of nearly 90% over the past decade.” The welcoming value systems here at ASU – particularly the missions of inclusion, local impact and social embeddedness – offer indigenous students, a place to call home. The Indigenous Design Collaborative has been approached by several institutions – Indigenous Futures Institute, University of British Columbia, The School of Architecture, Athabasca University, The Banff Arts Center, Seneca College, The University of Illinois and Laurentian University – to collaborate on research, project work and teaching. The Design School aspires to build a coalition of institutes engaged in similar pursuits, potentially offering an exchange to other regions.

**Similar Programs Offered at Arizona Public Universities:**

There are currently no degree programs at Arizona’s public universities that Indigenous worldviews as a lens for design.

**Objection(s) Raised by Another Arizona Public University? YES NO**

Has another Arizona public university lodged a written objection to the proposed program with the proposing university and the Board of Regents within seven days of receiving notice of the proposed program?

**If Yes, Response to Objections:**

Please provide details of how the proposing university has addressed the objection. If the objection remains unresolved, please explain why it is in the best interests of the university system and the state that the Board override it.

**New Resources Required? (i.e. faculty and administrative positions; infrastructure, etc.):**

Internal resources already allocated to the Herberger Institute for Design and the Arts will be reallocated to launch this program and student enrollment will support growth.

**Plan to Request Program Fee/Differentiated Tuition? YES NO**

**Estimated Amount:** \$4,000 per year

**Program Fee Justification:** The proposed fee will be equivalent to The Design School’s other graduate programs.

**Specialized Accreditation? YES NO**

**Accreditor:** None

## EXECUTIVE SUMMARY

### Request to Establish New Academic Program in Arizona

University: Arizona State University

<b>Name of Proposed Academic Program:</b>  MA in Education for Sustainability and Global Futures
<b>Academic Department:</b>  Mary Lou Fulton Teachers College  <i>Division of Educational Leadership and Innovation</i>
<b>Geographic Site:</b>  Tempe, West, Downtown, Polytechnic campus
<b>Instructional Modality:</b>  Immersion and online
<b>Total Credit Hours:</b>  30
<b>Proposed Inception Term:</b>  2023
<b>Brief Program Description:</b>  <p>The ecological crisis calls for a fundamental rethinking of the role of education. Despite global efforts to promote education as key to sustainability, education institutions continue to perpetuate the status quo by prioritizing workforce supply for economic growth over environmental sustainability and justice. By questioning the taken-for-granted assumptions about education and knowledge, the program challenges students to radically re-envision and rebuild education in ways that nurture non-exploitative and interdependent relations among people and our planet.</p> <p>The program aims to transform students' passion for global ecological justice into impactful education careers necessary for shaping learning futures in which both the planet and people can survive and thrive. What constitutes knowledge and learning in this arena is constantly in flux and requires collaboration across disciplinary, institutional, cultural, and geographic borders. Bridging a range of knowledge traditions (e.g., Indigenous, relational, decolonial, ecological, scientific), the program fuses disciplines and creative practice to boldly reimagine education for more sustainable, resilient and ecologically just futures.</p>



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Through transdisciplinary coursework, use-inspired inquiry, and socially embedded fieldwork, students will develop skills and experiences to:

- lead change through education in the face of ecological and social complexity
- engage in transdisciplinary knowledge production to transform the ways in which we educate future generations
- enact critical and ecologically attuned pedagogies that lead to meaningful individual and collective action
- influence educational policy and practice to prioritize intergenerational and ecological justice
- leverage transmedia modes of communication to transform narratives about education futures (e.g., from storytelling to algorithms).

The collaborative culture and transdisciplinary nature of the program is designed for education practitioners, policymakers, activists, and community leaders - across levels (e.g., PK-12, higher education) and settings (e.g., formal, informal) - who are seeking opportunities to use the power of education to transform society.

The degree program will advance the institutional mission of ASU as a global leader in innovative sustainability and resilience efforts by making an important contribution to fostering learning futures that can sustain the habitability of the planet, while attaining well-being for all humankind. In this pursuit, the program uniquely aligns with the vision of the Global Futures Laboratory in laying the education foundations necessary to shape global futures in which both people and the planet can survive and thrive.

### Learning Outcomes and Assessment Plan:

**Learning Outcome 1:** Students will demonstrate understanding of sustainability education theories and methods necessary for leading and implementing needed transformations in formal and informal educational settings in the face of ecological and social complexity.

- **Concepts:** sustainability education, learning processes of transformative change, collaborative and organizational learning theories, as well as specific action-oriented pedagogies (e.g., Place-Based Education) and educational practices
- **Competencies:** Students will be able to evaluate and synthesize sustainability education theories and methods necessary for leading and implementing transformations in formal and informal educational settings to critically examine and critique education paradigms and their role in reproducing the status quo, and explore alternative modes of education to foster a culture of sustainability and ecological justice.
- **Assessment Methods:** In core course, students will complete a sustainability education research and theory critical evaluation assignment where students will apply critical concepts and practices including the learning processes of transformative change, collaborative and organizational learning theories, action-oriented pedagogies, and educational practices focusing on educational settings and ecological and social complexity. The course instructor will provide assignment results to the program chair as part of the graduate program's annual review. The program

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chair and the faculty team will ensure assessment processes are followed, analyze generated data from the core course in addition to data supplied by the Mary Lou Fulton Teachers College (MLFTC) Office of Data Strategy, and recommend any actions for continuous improvement. Recommendations for action will then generate involvement from the MLFTC Continuous Improvement Topical Action Group (TAG) team who will assist in the review and refinement of curriculum, delivery, and content.

- **Measures:** Faculty-designed rubrics will be used to measure students' ability to evaluate and synthesize sustainability education theories and methods necessary for leading and implementing transformations in formal and informal educational settings in the sustainability education research and theory critical evaluation assignment from core course. In addition, the rubric will measure students' ability to apply education paradigms to impact education quality. Specifically, they will explore what threatens or promotes ecological and social sustainability and well-being as well as education's potential for social and ecological justice. The data from the sustainability education research and theory critical evaluation assignment rubrics, along with the additional data provided by the college Office of Data Strategy, will be analyzed yearly by the program chair and faculty team to specifically look at average rubric scores compared to historical data. Overall, satisfactory assessment is indicated when students meet or exceed the standards based on the compiled data. Information collected will be used by faculty, continuous improvement committees, and college administration to make critical improvement decisions.

**Learning Outcome 2:** Students will design and deliver critical and ecologically attuned learning experiences in an education setting, developed through sustainability-oriented pedagogies, practices, approaches, and competencies that are intended to lead to meaningful individual and collective action in reconceptualizing education for planetary futures.

- **Concepts:** Fundamental principles of sustainability-oriented pedagogies, competencies, and action in education settings; sustainability education theories; leadership in education settings
- **Competencies:** Students will be able to demonstrate knowledge of sustainability education theories and the role they play in reconceptualizing education for planetary futures by providing a rationale and applying skills for sustainability education as they design and enact fundamental principles of sustainability pedagogies, competencies, and action-focused approaches in an education setting.
- **Assessment Methods:** The literature review of sustainability-oriented pedagogies assignment in core course, and the final sustainable learning futures applied project will be used to assess students' ability to apply these critical concepts and practices to demonstrate their level of knowledge in sustainability education theories, principles, and pedagogies in leadership within education settings, while reconceptualizing critical and ecologically attuned learning experiences in education for planetary futures. Course instructors will provide assignment results to the program chair as part of the graduate program's annual review. The program chair and the faculty team will ensure assessment processes are followed, analyze generated data from the literature reviews and the applied projects—in addition to program data supplied by the Mary Lou Fulton Teachers College (MLFTC) Office of Data Strategy—and recommend

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actions for continuous improvement. Any recommendations for action will generate involvement from the MLFTC Continuous Improvement TAG team who will assist in the review and refinement of curriculum, delivery, and content.

- **Measures:** Faculty-designed rubrics evaluating the final results from the literature review in core course and the applied project will be used to measure students' facility to demonstrate knowledge and ability to engage in substantive evaluation and critique of overarching sustainability education pedagogies, practices, approaches and competencies of leadership in education settings and in reconceptualizing education for planetary futures. The results from the literature review assignment and applied project rubrics, along with the additional program data provided by the MLFTC Office of Data Strategy, will be analyzed yearly by the program chair and faculty team to specifically look at average rubric scores compared to historical data. Successful results will show competence in students' ability to design and deliver critical and ecologically attuned learning experiences in an education setting based on knowledge gained from the curriculum. Overall, satisfactory assessment is indicated when students meet or exceed the standards based on the compiled data. Information collected will be used by faculty, continuous improvement committees, and college administration to make critical improvement decisions.

**Learning Outcome 3:** Students will engage in community-based transdisciplinary research with a relevant stakeholder in addressing a problem/challenge with the aim to positively transform the ways in which we educate current and future generations.

- **Concepts:** Transdisciplinary inquiry: problem definition, transdisciplinary research design, data collection, data management, data analysis, transmedia communication
- **Competencies:** Students will be able to demonstrate an understanding of a community-based problem/challenge they are working to address. Using stakeholder input and relevant extant data, they will design and enact transdisciplinary research, including design, data collection, analysis, with the goal of sharing findings with the stakeholder to positively transform the way we educate society.
- **Assessment Methods:** Final assignments in required courses will be assessed to determine mastery of the program's concepts, principles and practices in community-based transdisciplinary research. Students will complete a transdisciplinary research project proposal and a culminating transdisciplinary research project in their required coursework to ensure mastery and ability to apply critical concepts and practices needed to address a community-based problem/challenge with a relevant stakeholder. The course instructors will provide assignment data to the program chair as part of the graduate program's annual review. The program chair, with assistance from the faculty team and the culminating experience committee, will then be responsible for ensuring the rubrics measuring the assignments are valid, and the assessment process is performed timely. In addition, program assessment data supplied by the MLFTC Office of Data Strategy will also be analyzed for continuous improvement. Recommendations for action will then generate involvement from the MLFTC Continuous Improvement TAG team and result in refinements in curriculum, delivery, and content.

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- **Measures:** Faculty-designed rubrics will be used to measure students' ability to plan, apply and enact community-based transdisciplinary research to address a problem/challenge with relevant stakeholders in the project proposal and a culminating transdisciplinary research project. The faculty-developed rubrics will assess students' ability to show competency in applying education paradigms impacting education quality with the goal of positively transforming the way we educate society. More specifically, it will evaluate if the student was able to design and enact a transdisciplinary research study, including research design, data collection, analysis, and share findings with stakeholders collaboratively in accessible and responsive ways. The data from the project proposal and culminating transdisciplinary research project rubrics, along with the additional data provided by the MLFTC Office of Data Strategy, will be analyzed yearly by the program chair and faculty team to specifically look at average rubric scores compared to historical data. Overall, satisfactory assessment is indicated when students meet or exceed the standards based on the compiled data. Information collected will be used by faculty, continuous improvement committees, and college administration to make critical improvement decisions.

**Projected Enrollment for the First Three Years:**

Year 1: 25

Year 2: 100

Year 3: 250

**Evidence of Market Demand:**

According to the U.S. Bureau of Labor Statistics, employment of environmental scientists and specialists, including in education, is projected to grow 8% from 2020 to 2030, about as fast as the average for all occupations. About 9,400 openings for environmental scientists and specialists are projected each year, on average, over the decade.

Current employment in this field as of 2020 is 87,000+, and projected employment by 2030 is 94,000+, which is an 8% growth. The median annual wage for environmental scientists and specialists was \$73,230 in May 2020. The lowest 10% earned less than \$42,960, and the highest 10 percent earned more than \$129,450. Jobs in the field of education are not specifically accounted for in the Bureau of Labor Statistics.

However, in a market analysis commissioned by Mary Lou Fulton Teachers College, Hanover Research found that "globally, sustainability education roles span multiple industries." Among the industries, the study named: educational settings; professional learning and training; media and communications; environmental conservation; local and national governments; nonprofit organizations; and environmental consulting and advising.

Governments around the world face growing pressure to deliver on their commitments to education for sustainable development in the Paris Agreement (article 12) and the 2030 Agenda for Sustainable Development (targets 4.7, 12.8 and 13.3). At the United Nations (UN) 2021 Convening of the Parties (COP26) in Glasgow, Ministers of Education and Environment pledged to integrate climate and sustainability education into policy and practice. Twenty-two governments pledged to integrate climate and sustainability education in compulsory school

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curricula at COP26. Pressure for others to follow suit will likely increase at the upcoming COP27 in Egypt.

There is likely a global demand for education that addresses sustainability that is not yet reflected in the U.S. Bureau of Labor of statistics. A growing number of universities outside the U.S. now offer comparable master's degrees that focus on sustainability education. The Hanover Research study looked at programs offered by Cape Breton University in Canada, the University of Eastern Finland, the University of Gothenburg and Linköping University in Sweden, The University of Edinburgh, and the University of Manchester.

As both a matter of mission and a matter of opportunity, ASU can leverage its intellectual capital in sustainability and education, its expertise in online learning and its commitment to excellence at scale to seize a leadership position in a young market that is very likely to grow globally.

**Similar Programs Offered at Arizona Public Universities:**

There are no other master's degrees in the area of education with a focus on sustainability, environmental studies, or climate change currently offered in any of the public universities in Arizona. There are some certificate programs available in related areas at the undergraduate and graduate levels, as well as extended education.

University of Arizona

- Master Gardener Certificate Program credential/ Pima and Maricopa County (extended education)

These certificate and professional development programs can serve as onramps into the proposed master's degree program, offering new opportunities for students to deepen their academic knowledge/skills and extend their professional networks as they prepare to catalyze social change through education practice and research.

Similar programs exist in private higher education institutions in Arizona, including Prescott College that offers MA in Education with an emphasis in Environmental Education and PhD in Sustainability Education. However, Prescott's MA program is not available online and its PhD program has residency components, which may prevent some students from enrolling. The proposed MA degree at ASU will expand access to all those who are interested in pursuing advanced study of climate, environmental, and sustainability education both nationally and internationally - regardless of their residency status.

**Objection(s) Raised by Another Arizona Public University? YES NO**

Has another Arizona public university lodged a written objection to the proposed program with the proposing university and the Board of Regents within seven days of receiving notice of the proposed program?

**If Yes, Response to Objections:**

Please provide details of how the proposing university has addressed the objection. If the objection remains unresolved, please explain why it is in the best interests of the university system and the state that the Board override it.

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**New Resources Required? (i.e. faculty and administrative positions; infrastructure, etc.):**

Internal resources already allocated to Mary Lou Fulton Teachers College will be reallocated to launch this program and student enrollment will support growth. No new books, library holdings, equipment, laboratory space or personnel will be required at this time. Existing faculty members' area(s) of expertise will be re-examined, and staffing will be adjusted across current faculty to optimize strengths and expertise. Staff positions that support the existing program, including admissions specialists, advisors, university supervisors and instructional designers, would continue in their current roles and support this additional program.

**Plan to Request Program Fee/Differentiated Tuition?                      YES    NO**

**Estimated Amount:** \$100 per credit (at 30 credits)

**Program Fee Justification:** Teachers College online master's degree programs have an approved fee to support online education programs.

**Specialized Accreditation?                      YES    NO**

**Accreditor:** North American Association for Environmental Education (NAAEE), Higher Education Accreditation

Accreditation examines both the alignment of a program to the guidelines and the assessment of participants against those same guidelines. Therefore, assessment data for at least two years will be provided to NAAEE for proper accreditation. New programs including the proposed MA, will submit a self-study audit when there is at least two years of available assessment data for NAAEE review.

## EXECUTIVE SUMMARY

### Request to Establish New Academic Program in Arizona

University: Arizona State University

<b>Name of Proposed Academic Program:</b>  MS in Applied Computing
<b>Academic Department:</b>  New College of Interdisciplinary Arts and Sciences  <i>School of Mathematical and Natural Sciences</i>
<b>Geographic Site:</b>  Tempe, West, Downtown, Polytechnic campus
<b>Instructional Modality:</b>  Immersion and online
<b>Total Credit Hours:</b>  30
<b>Proposed Inception Term:</b>  2024
<b>Brief Program Description:</b>  The MS in Applied Computing will provide students with advanced theoretical knowledge and research skills in computing, especially the high demand areas of networking and cybersecurity, database systems, and computational data science. Students will learn computer system architecture and understand operating system concepts. The applied curriculum offers a continuation of education at a master's level and is available to students with an undergraduate degree in applied computing, computing, mathematical sciences or equivalent.  This program is designed to prepare students for computing professions where they use learned technical skills to strategize, problem solve and develop solutions to pressing issues. This will allow students to create a positive impact on an organization or advance their academic career by pursuing a doctoral program to advance the field of applied computing.
<b>Learning Outcomes and Assessment Plan:</b>

**Learning Outcome 1:** Students will lead a collaborative and inclusive team to identify complex problems and coordinate solutions across disciplines.

- **Concepts:** interdiscipline, teamwork, leadership, communication, reporting
- **Competencies:** Students will have the ability to work with others in different disciplines to identify a problem, propose a solution, build complex systems and communicate findings effectively and confidently in both verbal and written formats.
- **Assessment Methods:** Students will lead a team project with their peers to research and provide a solution to a complex problem. Using their learned knowledge in computing, applied math and statistics, students will work with their team to break the original problem into computing and mathematical components, address the problem in their specific domain individually, then integrate their solutions to address the bigger problem as a team. Students will provide an individual written report that outlines how they addressed the problem in their specific domain, as well as their contribution to the final solution. The individual written reports will be included as part of their final applied project. Report results will be reviewed and compared to historical data for continuous program improvement.
- **Measures:** Competency in the outcome will be measured in multiple ways. First, faculty-designed rubrics will be used to evaluate students' ability to lead a team in identifying complex problems, as well as coordinating solutions with a team across disciplines. Second, performance will be measured indirectly by the acceptance of the team projects in a poster session of a national, regional, or local conference. Additionally, all student projects will be demonstrated at the ASU New College annual research and poster expo. Performance will be evaluated based on a faculty-designed survey completed after the poster expo that measures the student's ability to lead a team, find a solution and present their findings to a public audience. Satisfactory assessment is indicated when students meet or exceed the standards on a 3-point scale (1=highest).

**Learning Outcome 2:** Students will demonstrate an understanding of advanced cybersecurity concepts, principles, protocols, and practices, and will apply this knowledge to identify and solve a cybersecurity problem.

- **Concepts:** network security, wireless security, IoT security, network forensics, anomaly detection, machine learning, virtualization
- **Competencies:** Students will have the ability to find a solution to a cybersecurity problem by evaluating networking systems, emerging applications, vulnerabilities, attack and defense tools and methodologies.
- **Assessment Methods:** In the cybersecurity courses, students will build simulated enterprise networks with multiple routers and servers, automate the generation of network traffic, launch attacks with penetration testing tools and self-built attacking tools, and capture and analyze traffic involving normal network communication and attacks. Students will then be given network traffic captured in a controlled



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environment and asked to rebuild the network topology, applications, attacks, user activities for the given traffic, and to provide risk assessment of the network. Students will be observed and graded in their ability to address the cybersecurity problem. Students will provide a final written report that outlines their actions and solutions that addressed the cybersecurity problem. The reports will be graded, compiled and compared to historical data for program improvement.

- **Measures:** Student performance on the ability to find a solution to a cybersecurity problem will be measured using faculty-designed rubrics used to analyze the quality of the configured network, the student activities, and their ability to address the overall problem. Students will be scored based on the quality of discovery and reported topology, activities, and assessment. Satisfactory assessment is indicated when students meet or exceed the standards on a 3-point scale (1=highest).

**Learning Outcome 3:** Students will develop applied learning tools and materials using data-driven solutions for computing problems.

- **Concepts:** data collection, cleaning, analysis, modeling, prediction, visualization, use cases
- **Competencies:** Students will have the ability to write code or use tools to collect and process raw data, create mathematical or statistical models to describe the data and predict actions, create data visualizations to communicate to general users, and accumulate datasets and use cases.
- **Assessment Methods:** In the data science courses, students will use crawling APIs to collect data from websites, social media, etc., and write code to clean and prepare the data for introduction to mathematical or machine-learning models for analysis or prediction. Students will then package the tools, codes, models, and figures in a learning tools and materials report that will be included in their final applied project with the original data and discoveries. Students will be assessed for their ability to develop accurate and applied learning tools and materials that are used to provide data-driven solutions for computing problems. The data from the student scores will be collected and analyzed for continuous program improvement.
- **Measures:** Faculty-designed rubrics will be used to score students on their ability to develop accurate, applied learning tools and materials using data-driven solutions to solve computing problems. Satisfactory assessment is indicated when students meet or exceed the standards on a 3-point scale (1=highest).

**Projected Enrollment for the First Three Years:**

Year 1: 15

Year 2: 30

Year 3: 60

**Evidence of Market Demand:**

The applied computing undergraduate program at ASU West had 283 majors in Fall 2021. A brief 2022 survey in a senior-level applied computing course with 18 participants indicated that 50% of the students would choose to stay at ASU with an accelerated master's degree in

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applied computing after graduation, and another 27.8% of the students would consider it after gaining more industry experience. The success of the undergraduate applied computing program reflects the growing interest of this population in entering the computing industry in the West Valley. Additionally, 60% of West campus students choose West because of its location. Therefore, the proposed degree provides an opportunity for master's level study to students in the West Valley.

The U.S. Bureau of Labor Statistics report on computer and information technology occupations published in September of 2021 states, "Employment in computer and information technology occupations is projected to grow 13% from 2020 to 2030, faster than the average for all occupations (note: 7.7%). These occupations are projected to add about 667,600 new jobs. Demand for these workers will stem from greater emphasis on cloud computing, the collection and storage of big data, and information security. The median annual wage for computer and information technology occupations was \$91,250 in May 2020, which was higher than the median annual wage for all occupations of \$41,950".

Additionally, Cyberseek, a website resulting from the collaboration of Burning Glass Technology, the National Initiative for Cybersecurity Education, and CompTIA, indicates that "From October 2020 through September 2021, there were 162,700 openings for Information Security Analysts, but only 138,000 workers currently employed in those positions – an annual talent shortfall of 24,700 workers for cybersecurity's largest job." Arizona in particular has 16,845 total cybersecurity job openings and 24,618 employed cybersecurity workforce employees, indicating a large job market in this area.

**Similar Programs Offered at Arizona Public Universities:**

Arizona State University offers master's degrees in Computer Science, Software Engineering, Information Technology, Information Systems Management, and Global Security with a concentration in Cybersecurity. None of these have the same focus on applied computing, and many require more significant mathematical preparation for admission.

The University of Arizona has three related Master's degrees in Computer Science, Cybersecurity and Data Science. These degrees require considerably more mathematical background than the proposed program, and none have an applied focus.

**Objection(s) Raised by Another Arizona Public University? YES NO**

Has another Arizona public university lodged a written objection to the proposed program with the proposing university and the Board of Regents within seven days of receiving notice of the proposed program?

**If Yes, Response to Objections:**

Please provide details of how the proposing university has addressed the objection. If the objection remains unresolved, please explain why it is in the best interests of the university system and the state that the Board override it.

**New Resources Required? (i.e. faculty and administrative positions; infrastructure, etc.):**

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Internal resources already allocated to the New College of Interdisciplinary Arts and Sciences will be reallocated to launch this program and student enrollment will support growth. Additional faculty will be required as the program grows, to be identified through the planning process in collaboration with the dean's office. New College has a dedicated applied computing lab and cybersecurity lab space that can also support the proposed program.

**Plan to Request Program Fee/Differentiated Tuition?** YES NO

**Estimated Amount:** \$100 per semester.

**Program Fee Justification:** This program fee for the Applied Computing master degree is the same as the one for the Applied Computing undergraduate.

**Specialized Accreditation?** YES NO

**Accreditor:** N/A

## EXECUTIVE SUMMARY

### Request to Establish New Academic Program in Arizona

University: Arizona State University

<b>Name of Proposed Academic Program:</b>  MS in Neuroscience
<b>Academic Department:</b>  The College of Liberal Arts and Sciences  <i>School of Life Sciences</i>
<b>Geographic Site:</b>  Tempe, West, Downtown, Polytechnic campus
<b>Instructional Modality:</b>  Immersion and online
<b>Total Credit Hours:</b>  30
<b>Proposed Inception Term:</b>  2024
<b>Brief Program Description:</b>  An MS in Neuroscience will provide advanced knowledge on fundamental neuroscientific concepts, the neurobiological substrates of behavior, and cutting-edge experimental techniques for studying nervous system function. An important underlying theme will be to understand the genetic, cellular, and circuit-level changes associated with common neurodegenerative diseases, altered brain development, and neuropsychiatric disorders. In addition to mentored research opportunities with internationally recognized experts, this program will also offer opportunities to explore recent primary literature and hone communication, presentation and professional skills. Overall, the degree is meant to prepare students for entry into advanced research or clinical training programs; technical positions in academia, industry, and health care-related fields; or employment in sectors focused on education, consulting, biotechnology, law, pharmaceuticals, neuroprosthetics and artificial intelligence.  The MS in Neuroscience prioritizes ASU's mission and emphasis on interdisciplinary interactions. This program will draw upon collaborative relationships between neuroscientists in multiple ASU units by including courses and faculty mentors in the Department of Psychology, School of Life Sciences, School of Biological and Health Systems Engineering,

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and the School of Mathematical and Statistical Sciences. There will also be opportunities to conduct research with clinically focused partnering faculty at the Biodesign/Banner Neurodegenerative Disease Research Center, Barrow Neurological Institute, Mayo, Phoenix Children's Hospital, and TGen. This program will leverage innovative advances in ASU's online educational infrastructure to unite the neuroscience community distributed across Arizona and facilitate access to outstanding community partners with unique neuroscientific expertise. The program flexibility will enable students to readily access didactic material while maximizing opportunities to conduct hands-on research in off-campus laboratories.

**Learning Outcomes and Assessment Plan:**

**Learning Outcome 1:** Students will apply core neuroscientific concepts to address a research question regarding nervous system function and associated pathologies.

- **Concepts:** neuroanatomy, neural cell biology, synaptic physiology and function, neural plasticity, nervous system development, fundamental neural circuits underlying core behaviors, common pathological conditions affecting the nervous system
- **Competencies:** Students will be able to use core concepts such as neuroanatomical features of the human brain; the cellular, molecular, and synaptic substrates of neural circuit function; typical technical approaches and model systems to study brain function and notable pathological conditions affecting the nervous system to address a research question.
- **Assessment Methods:** MS in Neuroscience students are required to take core course Advanced Cellular and Molecular Neuroscience in their first year of enrollment. This course will require students to complete a written research paper and a primary manuscript presentation on a topic related to neuroscience answering a research question with instructor guidance. The evaluation of these assignments will show competency in the students' ability to apply core neuroscientific concepts to address a research question regarding nervous system function and associated pathologies. The course instructor will provide assignment results to the program director and the Neuroscience Executive committee as part of the graduate program's annual review. The program director and the Neuroscience Executive committee will work together to refine course materials and assignments for continuous improvement of the curriculum.
- **Measures:** Faculty-developed rubrics created by the instructor and program director in consultation with the Interdisciplinary Graduate Program in Neuroscience Executive committee will be used to evaluate student performance on the two required assignments—a research paper and a primary manuscript presentation—completed in the core course. The rubrics will focus on the students' understanding of core concepts noted above and the ability to address a research question regarding nervous system function and associated pathologies. Students will be assessed on a 3-point scale (1=highest) with successful performance determined if the majority respond at the highest level. Overall, satisfactory assessment is indicated when students meet or exceed the standards based on the data from the research paper and a primary manuscript presentation rubric. Annual review of outcomes will allow opportunities for continuous course improvement and refinement.

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**Learning Outcome 2:** Graduate students will be able to effectively communicate neuroscientific concepts through scientific presentation.

- **Concepts:** public speaking, scientific presentation preparation, data production and visual representation, peer communication skills and practices
- **Competencies:** Students will be able to effectively contextualize their research in typical presentation formats, prepare and present a PowerPoint presentation based on neuroscientific data, exhibit an ability to discuss and defend concepts, and professionally address questions related to their research and presentations.
- **Assessment Methods:** Students will be evaluated on their ability to effectively communicate neuroscientific concepts in three graded presentations. All students will take Research as a required course in the first year where they will be required to present their research to the course instructor and class. In addition, students are required to prepare and present a “research proposal” to their advisory committee/primary mentor by the end of the first year of the program, which will be reported in the School of Life Sciences Annual Student Progress Report by the primary mentor at the end of the first year of training and in the annual “Advisor Evaluation” to the school graduate programs office. Lastly, the students' speaking and presentation skills at the oral public defense of their thesis will be rated and scored by the primary mentor and advisory committee. This approach will provide longitudinal data during distinct stages of the program which will allow for a clear assessment of trajectory in evaluating student's ability to effectively communicate neuroscientific concepts. The Research instructor, primary mentor, and advisory committees will share data with the program director and Neuroscience Executive committee to improve training efforts and speaking skill development within the curriculum.
- **Measures:** Faculty-designed rubrics will be used to evaluate students' ability to effectively communicate neuroscientific concepts in each of the presentations. The rubric for the research course will be developed by the instructor and program director in consultation with the Neuroscience Executive committee. Students will be rated on a scale of 1-3 (1=highest) by the instructor. The primary mentor and advisory committee will also rate the student's ability to effectively communicate neuroscientific concepts during their research proposal presentation recorded the annual progress report at the end of the first year of training, and the student's public thesis defense at the end of the second year of the program on a scale of 1-3 (1=highest). Scores will be combined and reviewed by the program director and Neuroscience Executive committee. Overall, satisfactory assessment is indicated when students meet or exceed the standards based on the data from the presentation rubrics. Annual review of outcomes will allow opportunities for continuous course improvement and refinement.

**Learning Outcome 3:** Students will conduct independent research including strategizing experimental/scientific objectives, analyzing data, designing experiments, and reviewing scholarly literature.

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- **Concepts:** common experimental model systems, techniques to study the nervous system, basic statistics, experimental design, operating in team-based environments, goal setting, task planning, understanding of professional and ethical responsibilities
- **Competencies:** Students will be able to evaluate primary neuroscientific literature and understand typical methodologies, interpret associated results, explain the advantages and disadvantages of commonly used techniques to address their hypothesis, and work with the primary mentor/advisory committee to design an experiment that tests a hypothesis related to neuroscience as well as function efficiently in teams to achieve experimental goals.
- **Assessment Methods:** Students will identify a primary thesis mentor prior to admission to the program and form an advisory committee in the first semester of training who will guide them through the research process. Students' independent research plan and project will then be developed in consultation with the mentor and advisory committee. Students will be required to summarize their research in the "description of research" section of their annual student progress report required by all students. Student progress in their research project will be reviewed and rated each semester by the primary mentor and submitted in their annual advisor evaluation to the school graduate programs office. The students' research capabilities, including their ability to strategize experimental/scientific objectives, analyze data, design their experiment, and use scholarly literature, will be evaluated through their written thesis and public thesis defense at the end of their program. Results and analysis will be shared with the program directors and Neuroscience Executive committee and used for designing additional improvements to the program.
- **Measures:** Faculty-designed rubrics will be used to evaluate students' ability to conduct independent research, including evaluating primary neuroscientific literature, understanding of typical methodologies, interpreting associated results, and explaining the advantages and disadvantages of commonly used techniques to address their hypothesis in their "description of research" summary, written thesis, and oral defense. Each faculty-designed rubric will include a reporting scale of 1-3 (1=highest) completed by their primary mentor and advisory committee. The thesis results will be submitted on a thesis defense form to the school graduate programs office for recording. The Neuroscience program directors and the Neuroscience Executive Committee will review the results to refine curricular features meant to enhance student performance

**Projected Enrollment for the First Three Years:**

Year 1: 10

Year 2: 20

Year 3: 20

**Evidence of Market Demand:**

Neuroscience is a multidisciplinary field focused on understanding nervous system function and the biological mechanisms that underlie behavior. Students that earn a Neuroscience MS degree are well suited to enter professional medical, clinical, or doctoral training programs as

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well as multiple career paths in research, health care, industry, public health, and quantitative fields. Emsi Analyst data on various neuroscience-related positions suggests career opportunities for individuals with an MS in Neuroscience will grow 9.3% by 2026. The U.S. Bureau of Labor Statistics expects employment of medical scientists, a common career for neuroscientists, is projected to grow 17% from 2020 to 2030, much faster than the average for all occupations (<https://www.bls.gov/ooh/life-physical-and-social-science/medical-scientists.htm>). Students who complete this degree may immediately pursue positions as a laboratory technician; science writer; clinical research assistant; pharmaceutical sales representative; neuroeconomist; clinical psychologist; biology educator; public health areas centered on neurological disorders; artificial intelligence and prosthetics development; or technologist for neurological-related procedures in medical imaging, pharmacy or genetic counseling.

**Similar Programs Offered at Arizona Public Universities:**

The College of Health Solutions offers an Auditory Language Neuroscience MS that specifically emphasizes hearing/language disorders, but there are no broad Neuroscience or Neurobiology-focused MS degrees offered by Arizona public universities.

**Objection(s) Raised by Another Arizona Public University? YES NO**

Has another Arizona public university lodged a written objection to the proposed program with the proposing university and the Board of Regents within seven days of receiving notice of the proposed program?

**If Yes, Response to Objections:**

Please provide details of how the proposing university has addressed the objection. If the objection remains unresolved, please explain why it is in the best interests of the university system and the state that the Board override it.

**New Resources Required? (i.e. faculty and administrative positions; infrastructure, etc.):**

Internal resources already allocated to the School of Life Sciences will be reallocated to launch this program and student enrollment will support growth.

**Plan to Request Program Fee/Differentiated Tuition? YES NO**

**Estimated Amount:** \$250 per credit hour (at 30 credits)

**Program Fee Justification:** The program fee will support faculty for core courses and electives, including coordinating efforts to create and update courses. The instructional designer will be dedicated to helping faculty/TAs create and maintain online materials and courses for the program.

**Specialized Accreditation? YES NO**

**Accreditor:** N/A



**ACADEMIC DEVELOPMENT PLAN: PROGRAM CHANGES  
2023-2024**

**Request to Disestablish an Academic Program**

University: Arizona State University

<b>Name of Academic Program:</b>  AuD in Audiology
<b>Academic Department:</b>  College of Health Solutions
<b>Geographic Site:</b>  Tempe campus
<b>Instructional Modality:</b>  Immersion
<b>Last Term of operation:</b>  Fall 2023
<b>Brief Program Description:</b>  <p>The Doctor of Audiology (AuD) degree is a clinical doctorate program that trains students to become certified/licensed audiologists. The three-year course of study for the AuD consists of basic science coursework, professional knowledge coursework and clinical practicum experiences. Full-time commitment is critical because graduate courses are offered once per academic year. In addition, course content and the sequence of courses are closely tied to clinical practicum assignments.</p> <p>Students have the option of graduating after the completion of the three-year program of study or enrolling in a clinical externship during their fourth year for up to three additional credit hours of clinical training. A minimum of 850 hours of clinical training is required for graduation and is obtained during the first three years.</p> <p>Additional practicum hours toward the 1,820 hours required for the Certificate of Clinical Competence in Audiology, also known as CCC-A, by the American Speech-Language-Hearing Association (ASHA) can be met during completion of the fourth-year externship under the supervision of an ASHA-certified audiologist.</p>
<b>Reason for Disestablishing the Program:</b>  <p>The AuD program has traditionally been small with an average class size of 15-17 students. However, enrollment has declined recently, going from a cohort of 17 students admitted in 2019, to 12 students in 2020 and only 9 students in 2021. This enrollment decline has led to an operational deficit of an average of \$1.5 million per year. Furthermore, the student body</p>

## **ACADEMIC DEVELOPMENT PLAN: PROGRAM CHANGES 2023-2024**

has been composed of more than 50% out-of-state students, making the program even more expensive for those paying out-of-state tuition and reducing the likelihood that the program would enable the state of AZ to increase the audiology workforce, as out-of-state students are more likely to return to their home state than to remain in AZ to practice. National changes may also alter the future of the profession, such as the impact of FDA approved over-the-counter hearing aids on clinical revenue streams and scope of practice for audiologists. This, coupled with the expense and time required for a terminal doctoral degree, has caused matriculation into audiology programs to decline across the U.S. with many programs closing. Finally, faculty retention is another challenge both at ASU and nationally for audiology programs. In the past 5 years, ASU's audiology program has lost six clinical faculty and four academic faculty for various reasons (move, retirement, etc.).

To review and address these issues, the College of Health Solutions requested to close applications and not admit any new students for Fall 2022. After admission to the program was paused, the College of Health Solutions leadership encouraged the faculty to develop a strategic proposal for reviving the program, reducing and eventually eliminating the deficit, and creating other educational activities to enhance clinic and program revenue. Despite a concerted effort, the faculty could not provide a rationale for keeping the program open and could not predict that enrollment would increase. National experience with these programs is that the class average size is about 8 students per year, and there is no evidence that the ASU program would be any different. In that case, it is anticipated that the class size would decline even further.

Without an audiology program, the college will work to maintain and expand its clinical hearing services to include specialty clinics focused on pediatric hearing, cochlear implants, hearing conservation and vestibular/balance, all areas of need for the surrounding communities. Additionally, the audiology faculty will work as preceptors to train emerging audiologists from outside institutions and upskill current audiologists to adapt and learn new clinical skills to evolve with the discipline.

### **Disestablishment Plan**

Please explain how any students affected by the planned disestablishment of the program will be supported to earn their degree.

Current AuD students should experience no disruption to their required didactic coursework or clinical training. All required courses will continue to be offered until all students have graduated. The last cohort of students are scheduled to graduate in Spring 2025.

It is the experience of other closed audiology programs nationwide that the American Speech-Language-Hearing Association (ASHA) accreditation board has been willing to maintain program accreditation until all students complete their degrees. Thus, current students will still graduate from an accredited audiology program.

Existing students will be notified of the change. There are no current applicants for the program as we requested to close the application starting Fall 2022.

### **How will program resources be reallocated? (i.e. faculty and administrative positions; infrastructure, etc.):**

Existing resources will be reallocated to other speech and hearing programs and the speech and hearing clinic.

**ACADEMIC DEVELOPMENT PLAN: PROGRAM CHANGES**  
**2023-2024**

**Is this program in an ABOR designated high demand field ?**      **YES**    **NO**  
**Is the discontinued program in education, health, science, technology, engineering or math (STEM)?**

Health care.

Executive Director Signature: \_\_\_\_\_



Date: 2/2/23

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**ACADEMIC DEVELOPMENT PLAN: PROGRAM CHANGES  
2023-2024**

**Request to Disestablish an Academic Program**

University: Arizona State University

<b>Name of Academic Program:</b> MIHC in Integrated Health Care
<b>Academic Department:</b> College of Health Solutions
<b>Geographic Site:</b> None
<b>Instructional Modality:</b> Digital immersion only
<b>Last Term of operation:</b> Fall 2023
<b>Brief Program Description:</b>  Graduates of the MIHC degree program are prepared to develop, implement, evaluate and sustain integrated care delivery in diverse health care settings.  Through the Master of Integrated Health Care program, students gain management-level knowledge in health care operations, financial management, quality improvement, big data analytics, evidence-based practice, interprofessional leadership, teamwork and strategic planning. Students apply their knowledge and advance their competencies through a final project. With the final project, they have the opportunity to assist an existing or emerging practice to develop or improve programs that include interprofessional team-based health care, integrated care programs, or programs that integrate medical and behavioral health care.
<b>Reason for Disestablishing the Program:</b>  This niche program focuses specifically on the integration of primary care, mental health and behavioral health services in whole-person care settings, which has not been highly sought after by prospective students. Applications have been low since the program's inception despite offering via digital immersion, continued marketing efforts and adding more start dates.  Internal review revealed a lack of market demand for the program and that it does not offer enough of a differentiated value from the existing MS in Science of Health Care Delivery.

**ACADEMIC DEVELOPMENT PLAN: PROGRAM CHANGES**  
**2023-2024**

Both programs are delivered via digital immersion; use the same "health care administration" Search Engine Optimization keywords; teach similar concepts; and lead to similar careers. Finally, there is not sufficient full-time faculty bandwidth to support course development and delivery or to lead program administration and assessment.

Recent Enrollment:

2020-2021: 0 enrolled 2021-2022: 0 enrolled

Fall 2022: 8 admitted; 4 of which are enrolled

**Disestablishment Plan**

There are no continuing students in the MIHC in Integrated Health Care program. The eight students that have been admitted for Fall 2022 will be provided the option to move to the MS in Science of Health Care Delivery or another appropriate alternative.

**How will program resources be reallocated? (i.e. faculty and administrative positions; infrastructure, etc.):**

Existing resources will be reallocated to the MS in the Science of Health Care Delivery.

**Is this program in an ABOR designated high demand field ?**      **YES**      **NO**

Is the discontinued program in education, health, science, technology, engineering or math (STEM)?

Health care.

Executive Director Signature: \_\_\_\_\_



Date: 2/2/23

**ACADEMIC DEVELOPMENT PLAN: PROGRAM CHANGES  
2023-2024**

**Request to Move an Academic Program**

University: Arizona State University

<b>Name of Academic Program:</b>  MA in Creative Enterprise and Cultural Leadership
<b>Academic Department from which the program is being transferred:</b>  Herberger Institute for Design and the Arts  <i>Dean, Herberger Institute for Design and the Arts</i>
<b>Academic Department to which the program is being transferred:</b>  Herberger Institute for Design and the Arts  The Design School
<b>Geographic Site from which the program is being transferred:</b>  Tempe campus
<b>Geographic Site to which the program is being transferred:</b>  No change
<b>Instructional Modality:</b>  Campus immersion only
<b>Brief Program Description:</b>  This cross-disciplinary, collaborative program merges theory and practice in arts management, civic practice, creative placemaking, leadership and the management of innovation in the expanded creative fields.
<b>Reason for Transferring the Program:</b>  The Herberger Dean's Office helped develop the MA in Creative Enterprise and Cultural Leadership with input from faculty who have since left the university. Currently, only one faculty member serves this program and it has no dedicated staff support in the Dean's Office. Moving this degree to The Design School will align this program with other social/cultural design programs and build a stronger cohort of faculty support, mentorship and course offerings. Additionally, the move will further expand design thinking and graduate student leadership development in The Design School. Finally, the program and students will benefit from extant graduate student support structures and staffing.

**ACADEMIC DEVELOPMENT PLAN: PROGRAM CHANGES**  
**2023-2024**

This move will positively impact students by providing them a school environment with hundreds of potential peers from all across the world. In addition, there will be increased options for faculty mentors which will radically expand their potential coursework.

Executive Director Signature: \_\_\_\_\_



Date: \_\_\_\_\_

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**ACADEMIC DEVELOPMENT PLAN: PROGRAM CHANGES  
2023-2024**

**Request to Move an Academic Program**

University: Arizona State University

<b>Name of Academic Program:</b>  MS in Innovation and Venture Development
<b>Academic Department from which the program is being transferred:</b>  Herberger Institute for Design and the Arts  <i>Dean, Herberger Institute for Design and the Arts</i>
<b>Academic Department to which the program is being transferred:</b>  Herberger Institute for Design and the Arts  The Design School
<b>Geographic Site from which the program is being transferred:</b>  Tempe campus
<b>Geographic Site to which the program is being transferred:</b>  No change
<b>Instructional Modality:</b>  Immersion only
<b>Brief Program Description:</b>  The MS program in innovation and venture development integrates the most advanced practices and technologies from business, engineering and design in a transdisciplinary, experience-based program that prepares the next generation of leaders with skills needed for launching successful ventures in any industry or sector, inside existing organizations or as new entities. Graduates are prepared to lead cross-disciplinary teams in a world of growing uncertainty and ambiguity. They can identify needs and evaluate opportunities, generating insights from real-world problems; innovate solutions; and create and launch scalable business models that provide value to all stakeholders.
<b>Reason for Transferring the Program:</b>  The MS in Innovation and Venture Development currently has split ownership between the Herberger Institute for Design and the Arts (50%), Ira A. Fulton Schools of Engineering (25%), and W. P. Carey School of Business (25%). The program was originally intended to be

**ACADEMIC DEVELOPMENT PLAN: PROGRAM CHANGES**  
**2023-2024**

administratively maintained by The Design School for the Herberger portion, but was incorrectly entered in the original request for implementation. The Design School is currently not receiving enrollment growth or graduate program fees while providing full administrative and student support.

This will have no impact on students.

Executive Director Signature: \_\_\_\_\_



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**ACADEMIC DEVELOPMENT PLAN: PROGRAM CHANGES  
2023-2024**

**Request to Rename an Academic Program**

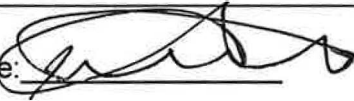
University: Arizona State University

<b>Current Name of Academic Program:</b>  BS in Digital Culture
<b>New Name of Academic Program:</b>  BS in Media Arts and Sciences
<b>Academic Department:</b>  Herberger Institute for Design and the Arts  <i>School of Arts, Media and Engineering</i>
<b>Geographic Site:</b>  Tempe campus
<b>Instructional Modality:</b>  Both digital and campus immersion
<b>Brief Program Description:</b>  This program teaches students to understand the transformative role of digital technology in cultural practice, society and day-to-day life, emphasizing the strongest emerging trends in cultural media: systems and processes that integrate digital technology with the everyday physical human experience. Students in the Bachelor of Science program complement the knowledge acquired through digital culture coursework with a more advanced understanding of the programming, data structures, signals processing and system architecture aspects of new media.
<b>Reason for Renaming the Program:</b>  The program has reached a plateau in enrollment growth (at around 350-375 undergraduates). The school can grow this degree, with an online version that mirrors the immersion degree. Based on research from ASU Online, the online degree is also struggling to grow quickly, partly because of its name. Digital Culture is not an industry standard name. Media Arts and Sciences is the name of the school's existing PhD program, and is a common and recognizable name. It is most notably associated with MIT's Media Arts and Sciences master's degree in the MIT Media Lab, and the terms "media" and "media arts" are also widely used in degree programs across the country, including Interactive Media Arts at NYU, Emerging Media Arts at UT Dallas, Media Arts and Sciences at Indiana University and more.

**ACADEMIC DEVELOPMENT PLAN: PROGRAM CHANGES**  
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Due to growth in the wide industry of media arts, and immersive technologies like virtual and extended reality, the school believes there is a growing demand for their graduates, who will have the foundations to become media programmers, 3D artists, visual and VR storytellers, sound and video designers, educators, and more, as techno-fluent and culturally-aware changemakers in a society increasingly governed by technological advances.

Executive Director Signature: \_\_\_\_\_



Date: 2/2/23

**ACADEMIC DEVELOPMENT PLAN: PROGRAM CHANGES  
2023-2024**

**Request to Rename an Academic Program**

University: Arizona State University

<b>Current Name of Academic Program:</b>  BA in Digital Culture
<b>New Name of Academic Program:</b>  BA in Media Arts and Sciences
<b>Academic Department:</b>  Herberger Institute for Design and the Arts  <i>School of Arts, Media and Engineering</i>
<b>Geographic Site:</b>  Tempe campus
<b>Instructional Modality:</b>  Campus immersion only
<b>Brief Program Description:</b>  The BA program in digital culture equips students with the technical skills to create computational media and the cultural skills to know when or why to apply them.  Students learn to create computational media, which is computation combined with objects, sound, video, time, space, culture and bodies; breathe behavior into media, objects or systems by programming; and think critically about how computation impacts lives and how culture makes a difference in how people experience computational media, a critical skill in this dynamic age.
<b>Reason for Renaming the Program:</b>  The program has reached a plateau in enrollment growth (at around 350-375 undergraduates). The school can grow this degree, with an online version that mirrors the immersion degree. Based on research from ASU Online, the online degree is also struggling to grow quickly, partly because of its name. Digital Culture is not an industry standard name. Media Arts and Sciences is the name of the school's existing PhD program, and is a common and recognizable name. It is most notably associated with MIT's Media Arts and Sciences master's degree in the MIT Media Lab, and the terms "media" and "media arts" are also widely used in degree programs across the country, including Interactive Media Arts at NYU, Emerging Media Arts at UT Dallas, Media Arts and Sciences at Indiana University and more.

**ACADEMIC DEVELOPMENT PLAN: PROGRAM CHANGES**  
**2023-2024**

Due to growth in the wide industry of media arts, and immersive technologies like virtual and extended reality, the school believes there is a growing demand for their graduates, who will have the foundations to become media programmers, 3D artists, visual and VR storytellers, sound and video designers, educators, and more, as techno-fluent and culturally-aware changemakers in a society increasingly governed by technological advances.

Emerging Media Arts at UT Dallas, Media Arts and Sciences at Indiana University and more.

Executive Director Signature: 

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# ACADEMIC DEVELOPMENT PLAN: PROGRAM CHANGES

2023-2024

## Request to Rename an Academic Program

University: Arizona State University

**Current Name of Academic Program:**

BSE in Industrial Engineering

**New Name of Academic Program:**

BSE in Industrial Decision Engineering and Analytics

**Academic Department:**

Ira A. Fulton Schools of Engineering

*School of Computing and Augmented Intelligence*

**Geographic Site:**

Tempe campus

**Instructional Modality:**

Campus immersion only

**Brief Program Description:**

Industrial engineering pertains to the design, improvement, installation and operation of integrated systems of people, materials, information, equipment and energy with the purpose of determining efficient ways to make a product or provide a service. Industrial engineering draws upon specialized knowledge and skill in the mathematical, physical and social sciences and the principles and methods of engineering analysis and design to help design efficient manufacturing and service systems that integrate people, equipment and information.

**Reason for Renaming the Program:**

The name change of the BSE in Industrial Engineering to Industrial Decision Engineering and Analytics will highlight the program's focus on the design, operation and improvement of systems required to meet societal needs for products and services.

The underlying concepts for the BSE program in industrial engineering include certain business principles but emphasize the use of mathematics and information technology to build models to describe, understand and optimize system performance. Depending on the subspecialties involved and the intended application, industrial engineering may also be known as operations management, management science, operations research, systems engineering or manufacturing engineering.


The current name of Industrial Engineering makes our program appear related to labor-intensive manufacturing jobs, although our program focuses mainly on knowledge and

**ACADEMIC DEVELOPMENT PLAN: PROGRAM CHANGES**  
**2023-2024**

analytical skills for project and operational planning and management decisions in various industries including manufacturing, services, health care, IT, and so on. Changing the name from Industrial Engineering to Industrial Decision Engineering and Analytics will highlight our program's focus on decisions and analytics in various industries rather than labor-intensive types of "industrial" jobs.

This degree name change will attract more students, especially high school students, and current students will benefit from a more marketable name.

Executive Director Signature:



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**ACADEMIC DEVELOPMENT PLAN: PROGRAM CHANGES  
2023-2024**

**Request to Move an Academic Program**

University: Arizona State University

<b>Name of Academic Program:</b>  MS in Engineering
<b>Academic Department from which the program is being transferred:</b>  Ira A. Fulton Schools of Engineering  <i>The Polytechnic School</i>
<b>Academic Department to which the program is being transferred:</b>  Ira A. Fulton Schools of Engineering  <i>School of Manufacturing Systems and Networks</i>
<b>Geographic Site from which the program is being transferred:</b>  Polytechnic campus
<b>Geographic Site to which the program is being transferred:</b>  No change
<b>Instructional Modality:</b>  Immersion
<b>Brief Program Description:</b>  Students of the MS program in engineering develop applied analytical expertise across disciplinary boundaries, with direct applications of advanced design principles to system design, management and control.  Students' expertise, developed through the core curriculum, is reinforced with the flexibility of focus area options that include alternative energy, mechanical engineering and manufacturing engineering.
<b>Reason for Transferring the Program:</b>  With the recent creation of the new School of Manufacturing Systems and Networks, it has been determined that this degree better aligns with the mission of the school. Additionally, faculty members supporting this program have been moved to the School of Manufacturing Systems and Networks as their academic home.

Executive Director Signature



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**ACADEMIC DEVELOPMENT PLAN: PROGRAM CHANGES  
2023-2024**

**Request to Disestablish an Academic Program**

University: Arizona State University

<b>Name of Academic Program:</b>  BAE in Early Childhood and Early Childhood Special Education
<b>Academic Department:</b>  Mary Lou Fulton Teachers College  <i>Division of Teacher Preparation</i>
<b>Geographic Site:</b>  Tempe campus
<b>Instructional Modality:</b>  Campus immersion only
<b>Last Term of operation:</b>  Fall 2023
<b>Brief Program Description:</b>  The BAE program for early childhood education and early childhood special education prepares students to be eligible for dual certification in both early childhood education and early childhood special education (birth to age 8).
<b>Reason for Disestablishing the Program:</b>  Over the past few years, the Mary Lou Fulton Teachers College has redesigned the teacher preparation programs and uncoupled content areas to provide our students with more personalized options in how they can configure their program majors and certificate options. As part of these revisions, the college has established a new bachelor's degree, the BAE in Early Childhood Education (approved by ABOR in November of 2020) among other programs. These new options will take the place of this degree and therefore, this degree is no longer needed for future enrollment. This program is not being disestablished for low enrollment, but instead to offer alternative options to students that will better suit their needs.
<b>Disestablishment Plan</b>  Students who are currently active will complete the remainder of their program as it stands. For inactive students, or those who are interested in attending in the Fall 2022 or after, the

**ACADEMIC DEVELOPMENT PLAN: PROGRAM CHANGES  
2023-2024**

college's recruitment and advising teams will contact students and explain to them the new options. Additionally, the website will direct students to the new program offerings.

**How will program resources be reallocated? (i.e. faculty and administrative positions; infrastructure, etc.):**

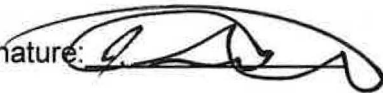
Resources from this program will be reallocated to the BAE in Early Childhood Education.

**Is this program in an ABOR designated high demand field ?      YES      NO**

Is the discontinued program in education, health, science, technology, engineering or math (STEM)?

Education.

Executive Director Signature:



Date: 2/2/23

**ACADEMIC DEVELOPMENT PLAN: PROGRAM CHANGES  
2023-2024**

**Request to Disestablish an Academic Program**

University: Arizona State University

<b>Name of Academic Program:</b>  BAE in Special Education and Elementary Education
<b>Academic Department:</b>  Mary Lou Fulton Teachers College  <i>Division of Teacher Preparation</i>
<b>Geographic Site:</b>  Tempe, Polytechnic and West campuses
<b>Instructional Modality:</b>  Immersion
<b>Last Term of operation:</b>  Fall 2023
<b>Brief Program Description:</b>  The BAE in special education and elementary education prepares students to work with all learners in inclusive settings.  Graduates earn an institutional recommendation from ASU for Arizona teacher certification in Mild/Moderate Disabilities Special Education, K-12, Elementary Education, K-8, and an endorsement in Structured English Immersion, preK-12, through the Arizona Department of Education.
<b>Reason for Disestablishing the Program:</b>  Over the past few years, Mary Lou Fulton Teachers College has redesigned our teacher preparation programs and uncoupled content areas to provide our students with more personalized options in how they can configure their program majors and certificate options. As part of these revisions, the Teachers College sought to establish a new bachelor's degree in special education. These new options will take the place of this degree in Special Education and Elementary Education and therefore, this degree is no longer needed for future enrollment. The disestablishment is not being requested due to low enrollment. It is being requested for a reorganization of programs.

**ACADEMIC DEVELOPMENT PLAN: PROGRAM CHANGES**  
**2023-2024**

**Disestablishment Plan**

Please explain how any students affected by the planned disestablishment of the program will be supported to earn their degree.

Students who are currently active will complete the remainder of their program as it stands. For inactive students, or those who are interested in attending in the Fall 2022 or after, the college's recruitment and advising teams will contact students and explain to them the new options. Additionally, the website will direct students to the new program offerings.

**How will program resources be reallocated? (i.e. faculty and administrative positions; infrastructure, etc.):**

Resources will be reallocated to the new BAE in Special Education.

**Is this program in an ABOR designated high demand field ?**      **YES**      **NO**

Is the discontinued program in education, health, science, technology, engineering or math (STEM)?

Education

Executive Director Signature: \_\_\_\_\_



Date: 2/2/23

**ACADEMIC DEVELOPMENT PLAN: PROGRAM CHANGES  
2023-2024**

**Request to Rename an Academic Program**

University: Arizona State University

<b>Current Name of Academic Program:</b>  MA in Social Technologies
<b>New Name of Academic Program:</b>  MA in Social Data Science
<b>Academic Department:</b>  New College of Interdisciplinary Arts and Sciences  <i>School of Social and Behavioral Sciences</i>
<b>Geographic Site:</b>  West campus
<b>Instructional Modality:</b>  Both immersion and digital immersion
<b>Brief Program Description:</b>  The MA in Social Technologies program is for those interested in the ways new kinds of social data introduce challenges and opportunities to society.  The program combines a thorough grounding in digital social science with the skills needed for engaging in the analysis of social data. This unique combination provides graduates with the ability to understand and contribute to creating ethical social platforms. They are also well positioned to advise institutions, businesses and government agencies on appropriate policies, and to draw on large-scale trace data to help address significant social issues.  The MA offers engaging research at the intersection of data and society. It prepares graduates to be leaders in social data science, working with organizations to help them make ethical and effective use of social data, consulting on broader issues of social change and networked technologies, or continuing on to doctoral work in cognate fields.
<b>Reason for Renaming the Program:</b>  As part of ASU's growing portfolio of data science programs, we have revised and will relaunch one of our core graduate programs. Formerly called "social technologies," this program brings together activities focused on the use of data science techniques to understand social behavior as well as in how such data can impact social behavior and

**ACADEMIC DEVELOPMENT PLAN: PROGRAM CHANGES**  
**2023-2024**

structures. With interdisciplinary faculty who have experience in applied research and industry, this program affords the opportunity for students to gain valuable skills in data science techniques specific to understanding social behavior (a highly in-demand and marketable skill set). Furthermore, our students understand the social consequences of such "big data" by learning how other entities (such as industry and technology companies) use data to shape social behavior.

"Data Science" and "Social Data Science" is a relatively new field but is experiencing explosive growth. Data science combines elements of statistics, research methods, information science, computer science, and social science. As explained above, this New College program focuses on some of the social science applications and implications of data science more generally. The Department of Labor does not specifically address the title of "Data Science," though the related career of statistical analyst is "projected to grow 33 percent from 2020 to 2030, much faster than the average for all occupations." Another related career, computer and information scientists, is "projected to grow 22 percent from 2020 to 2030, much faster than the average for all occupations."

The name change has been proposed after extensive discussion with ASU Online regarding the market demand for this program. Similar programs do exist, though are only now starting to use this name in the U.S. Our curriculum echoes the small number of existing and emerging programs that use this nomenclature (Oxford, LSE, Essex, Sussex, Exeter, UCLondon, Trinity, Copenhagen, Aalborg, KU Leuven, Helsinki, Hong Kong U, and recently the U of Maryland).

Executive Director Signature



Date:

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**ACADEMIC DEVELOPMENT PLAN: PROGRAM CHANGES  
2023-2024**

**Request to Move an Academic Program**

University: Arizona State University

<b>Name of Academic Program:</b>  PhD in Applied Mathematics for the Life and Social Sciences
<b>Academic Department from which the program is being transferred:</b>  The College of Liberal Arts and Sciences <i>School of Human Evolution &amp; Social Change</i>
<b>Academic Department to which the program is being transferred:</b>  College of Global Futures <i>School of Complex Adaptive Systems</i>
<b>Geographic Site from which the program is being transferred:</b>  Tempe campus
<b>Geographic Site to which the program is being transferred:</b>  No change
<b>Instructional Modality:</b>  Campus immersion only
<b>Brief Program Description:</b>  The PhD program in applied mathematics for the life and social sciences focuses on the training needed for analyzing and more definitively answering questions about underlying patterns hidden within human health, behaviors and experiences, and for teaching others to do the same.  Program participants learn new applications for tools such as agent-based models, evolutionary computing, geographical information systems, machine learning, multiobjective optimization of nonlinear dynamical systems, and stochastic processes. In doing so, they unlock new revelations and categories for not just understanding the material, but also the need for scientists and professionals quantitatively trained in the life and social sciences.

**ACADEMIC DEVELOPMENT PLAN: PROGRAM CHANGES**  
**2023-2024**

**Reason for Transferring the Program:**

The degree and students will be better served by moving this program to the School of Complex Adaptive Systems in the College of Global Futures. The College of Global Futures supports this transition, has resources to better serve the students, and plans to develop these programs congruent with their goals.

Students will benefit from having dedicated faculty teaching and mentoring them in the new school. The impact on existing students will be minimal as the schools are working to make sure courses are covered during the transition and there is a smooth advising handoff between units.

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**ACADEMIC DEVELOPMENT PLAN: PROGRAM CHANGES  
2023-2024**

**Request to Move an Academic Program**

University: Arizona State University

<b>Name of Academic Program:</b>  BS in Applied Mathematics for the Life and Social Sciences
<b>Academic Department from which the program is being transferred:</b>  The College of Liberal Arts and Sciences  <i>School of Human Evolution &amp; Social Change</i>
<b>Academic Department to which the program is being transferred:</b>  College of Global Futures  <i>School of Complex Adaptive Systems</i>
<b>Geographic Site from which the program is being transferred:</b>  Tempe campus
<b>Geographic Site to which the program is being transferred:</b>  No change
<b>Instructional Modality:</b>  Immersion
<b>Brief Program Description:</b>  The BS in applied mathematics for the life and social sciences is unlike any other math program. It offers a novel approach to investigating, integrating and solving problems in the physical, life and social sciences in such topics as mass violence, contagion, wildlife-human interactions and the transmission of behaviors through influence.  Degree seekers in this program are immersed in the use of mathematical theory, modeling and computational methods while collaborating with and contributing to diverse fields such as anthropology, global health and environmental social science.
<b>Reason for Transferring the Program:</b>  The degree and students would be better served by moving this program to the School of Complex Adaptive Systems in the College of Global Futures. The College of Global Futures

**ACADEMIC DEVELOPMENT PLAN: PROGRAM CHANGES**  
**2023-2024**

supports this transition, has resources to better serve the students, and plans to develop this program congruent with their goals.

Students will benefit from having dedicated faculty teaching and mentoring them in the new school. The impact on existing students will be minimal as the school is working to make sure courses are covered during the transition and there is a smooth advising handoff between units.

Executive Director Signature:



Date: 2/13/2023

**ACADEMIC DEVELOPMENT PLAN: PROGRAM CHANGES  
2023-2024**

**Request to Rename an Academic Program**

University: Arizona State University

<b>Current Name of Academic Program:</b>  PhD in Spanish
<b>New Name of Academic Program:</b>  PhD in Spanish Literature and Culture
<b>Academic Department:</b>  The College of Liberal Arts and Sciences  <i>School of International Letters and Cultures</i>
<b>Geographic Site:</b>  Tempe campus
<b>Instructional Modality:</b>  Immersion
<b>Last Term of operation:</b>  Fall 2023
<b>Brief Program Description:</b>  The Spanish PhD program consists of two specializations in Spanish literature or culture and three tracks: early modern, Mexican-American studies and visual cultures.  The specializations in Spanish literature and cultural studies, which are intended to be as flexible as possible, establish broad areas of competence through an individualized program of study.
<b>Reason for Renaming the Program:</b>  The School of International Letters and Cultures requests that its PhD in Spanish be renamed to the PhD in Spanish Literature and Culture to reflect its emphasis as well as new directions in the field. There are 35 students currently in the PhD program. The name change will demonstrate an official recognition of their specific training in literature and culture, and will give an advantage to our students in the market for both academic and non-academic positions.

**ACADEMIC DEVELOPMENT PLAN: PROGRAM CHANGES**  
**2023-2024**

Students will be contacted via email by the Program Advisor informing them of the name change as well as the benefits and opportunities the change will offer to them on the job market, both in and outside of academia.

Intended careers include both academic and non-academic positions, including faculty positions in higher education, as well as careers in government, editing and communications, interpretation fundraising and other careers. The emphasis on Spanish literature and culture will better position our students for these non-academic positions

The name change will not only allow for enhanced recruitment but also align with many of our peer and aspirational institutions with similar names appearing at Rutgers, the University of Iowa, Georgetown University, the University of Maryland and Harvard.

Executive Director Signature:



Date:

2/13/2023

**ACADEMIC DEVELOPMENT PLAN: PROGRAM CHANGES  
2023-2024**

**Request to Rename an Academic Program**

University: Arizona State University


<b>Current Name of Academic Program:</b>  BA in Earth and Environmental Studies
<b>New Name of Academic Program:</b>  BA in Earth and Environmental Sciences
<b>Academic Department:</b>  The College of Liberal Arts and Sciences  <i>School of Earth and Space Exploration</i>
<b>Geographic Site:</b>  Tempe campus
<b>Instructional Modality:</b>  Immersion
<b>Brief Program Description:</b>  The BA program in earth and environmental studies provides a foundational understanding of the evolution of the earth system with an emphasis on the planetary context for sustainable human societies.  The degree program includes broad training in the physical sciences, especially process-oriented geosciences that focus on Earth's life-sustaining surface environment.
<b>Reason for Renaming the Program:</b>  One hundred percent of respondents in a survey of present and past Earth and Environmental Studies majors indicated they favor the proposed name change and specifically would prefer the name "Earth and Environmental Sciences" to appear on their diploma. Given this and the motivations in terms of the graduate job market, enrollment in the degree is expected to increase. The biggest difference will be in the yield of admitted students actually enrolling. This degree attracts a large number of applications (more than any other School of Earth and Space Exploration degree), but yield has dropped from ~20% to ~10%. Our research indicates that this drop is likely attributable to the unfortunate choice of degree name and the peer advice students find online when deciding where to enroll. The school hopes to bring yield up to near the mean in the Natural Sciences (~28%).

**ACADEMIC DEVELOPMENT PLAN: PROGRAM CHANGES  
2023-2024**

Future state-wide and national demand is strong in career paths for Earth and Environmental Sciences BA graduates. There are many career opportunities, according to the U.S. Bureau of Labor Statistics, available to graduates of this program, including but not limited to: Environmental scientist (87k jobs in 2020, 8% growth, median salary \$73k), Geoscientist (29k jobs in 2020, 7% growth, median salary \$93k), Conservation Scientist/Natural Resource Manager (39k jobs in 2020, 7% growth, median salary \$64k), Hydrologist (6.5k jobs in 2020, 6% growth, median salary \$84k), Geological and Hydrologic Technicians (17k jobs in 2020, 8% growth, median salary \$73k), Natural Science Manager (79k jobs in 2020, 9% growth, median salary \$51k), Environmental Science technician (34k jobs in 2020, 11% growth, median salary \$47k), and Environmental science educator (Secondary Ed: 999k jobs in 2020, 8% growth, median salary \$63k). These data are corroborated in data reported by the Occupational Information Network.

Once the name change is approved, admitted students will be notified by direct text message, current students by email and on School of Earth and Space Exploration social media, and an announcement at the school Community Conversations and in core courses in the major, and on our website.

Executive Director Signature



Date:

2/13/2023



**ACADEMIC DEVELOPMENT PLAN: PROGRAM CHANGES  
2023-2024**

**Request to Rename an Academic Program**

University: Arizona State University

<b>Current Name of Academic Program:</b>  BA in Asia Studies
<b>New Name of Academic Program:</b>  BA in Global Asia Studies
<b>Academic Department:</b>  The College of Liberal Arts and Sciences <i>School of Historical, Philosophical &amp; Religious Studies</i>
<b>Geographic Site:</b>  Tempe campus
<b>Instructional Modality:</b>  Immersion
<b>Brief Program Description:</b>  The BA program in Asia studies offers students the opportunity for in-depth study of East Asia, South Asia or Southeast Asia through a coherent concentration of academic study across a number of disciplines. The transdisciplinary approach provides students with a variety of intellectual tools that enable them to address contemporary political, social and cultural issues in Asia and apply their knowledge in various academic and practical settings.
<b>Reason for Renaming the Program:</b>  The renamed BA in Global Asia Studies degree will allow students to study six tracks that will connect and combine into a global vision that studies the impact and significance of Asia's populations, cultures, and diasporas throughout the world, while also expanding knowledge about specific Asian languages, nations, and regions. The change aims to both broaden and refine the study of Asia, that is, the home of the world's largest populations, fastest growing economies, and oldest civilizations in terms of academic scholarship and learning and professional qualification and preparation. It will allow us to remain competitive in recruiting students and to align with other Universities in the USA and worldwide.  The East-West Center's 2020 Arizona Fact Sheet shows that Arizona's economy and immigrant populations are drivers linking this state to countries throughout Asia and to Asian interests globally. In terms of social embeddedness, we note that 27% of Arizona's export in

**ACADEMIC DEVELOPMENT PLAN: PROGRAM CHANGES  
2023-2024**

2020 went to the Indo-Pacific. Arizona is home to more than 300,000 citizens of Asian descent and 73% of the state's international students come from this region. The need for local and national expertise on Asia will further increase as the City of Phoenix develops its Phoenix Global Rising Initiative.

There will be no negative impact for continuing students. The name change will enhance, multiply and specify students' professional opportunities in a wide range of job sectors such as teaching, journalism, international law, global finance, banking, public health, human rights, armed forces, and many more.

Executive Director Signature: 

Date: 2/13/2023

**ACADEMIC DEVELOPMENT PLAN: PROGRAM CHANGES  
2023-2024**

**Request to Disestablish an Academic Program**

University: Arizona State University

<b>Name of Academic Program:</b>  MALM in Applied Leadership and Management
<b>Academic Department:</b>  Thunderbird School of Global Management  <i>Dean, Thunderbird School of Global Management</i>
<b>Geographic Site:</b>  None
<b>Instructional Modality:</b>  Digital immersion only
<b>Last Term of operation:</b>  Fall 2023
<b>Brief Program Description:</b>  The Master of Applied Leadership and Management program is an in-depth, professional degree program that features applicable training in the nuances of managing a global business, government agency or nonprofit organization.
<b>Reason for Disestablishing the Program:</b>  During a strategic review, Thunderbird decided to disestablish Master of Applied Leadership and Management in favor of a new degree – the Master of Leadership and Management. This new program was submitted as part of the 2021-2022 Academic Plan.
<b>Disestablishment Plan</b>  Current students have already been surveyed regarding the change and will be given the choice to stay with the MALM or switch to the new MLM. Program leadership and academic advisors will make sure students understand the differences in degree requirements and will advise on course equivalencies or substitutions in order to graduate on time. Prospective students and recently admitted students will also be advised of the differences in programs so that they can make appropriate choices on when they want to start the program.

**ACADEMIC DEVELOPMENT PLAN: PROGRAM CHANGES  
2023-2024**

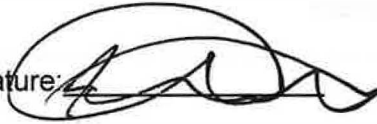
**How will program resources be reallocated? (i.e. faculty and administrative positions; infrastructure, etc.):**

Resources will be allocated toward the MLM in Leadership and Management.

**Is this program in an ABOR designated high demand field ?      YES      NO**

Is the discontinued program in education, health, science, technology, engineering or math (STEM)?

Executive Director Signature:



Date: 2/13/2023

**ACADEMIC DEVELOPMENT PLAN: PROGRAM CHANGES  
2023-2024**

**Request to Disestablish an Academic Program**

University: Arizona State University

<b>Name of Academic Program:</b>  MPS in Community Development Practice
<b>Academic Department:</b>  Watts College of Public Service and Community Solutions  <i>School of Community Resources and Development</i>
<b>Geographic Site:</b>  Downtown Phoenix campus
<b>Instructional Modality:</b>  Immersion
<b>Last Term of operation:</b>  Fall 2023
<b>Brief Program Description:</b>  The MPS program in community development practice trains existing and future practitioners in approaches to developing healthy, sustainable and resilient communities.  The program provides students with historical and theoretical foundations, applied research skills and core competencies centered around community building, development practices and the facilitation of democratic and cross-sector collaboration toward social innovation and community solutions. It allows students to establish an emphasis on a wide range of topics including business, law, economic development, housing, health, sustainability, education, social and environmental justice, or nonprofit leadership and management, drawing from the extensive expertise of ASU faculty.
<b>Reason for Disestablishing the Program:</b>  Since the establishment of the program in 2020, no students were ever enrolled despite marketing efforts. It was better to use <del>limited resources</del> to build up current and thriving programs than to dedicate resources to an unestablished program. Current research trends indicate that all the programs are small/boutique in nature so the probability of growing this to scale, as is needed at ASU, is limited. UC Davis for example has roughly 30 students. Community advocacy in SSW, Prescott College ( <a href="https://www.prescott.edu/">https://www.prescott.edu/</a> ), UC Davis ( <a href="https://www.library.ucdavis.edu/guide/community-development/">https://www.library.ucdavis.edu/guide/community-development/</a> ), are all competitors. Current

**ACADEMIC DEVELOPMENT PLAN: PROGRAM CHANGES**  
**2023-2024**

employment data given the pandemic are not truly depictive of the current situation. The next couple of years will yield more reliable data points.

Some of the core classes developed will be incorporated as electives for the school's current degree programs.

**Disestablishment Plan**

No students have enrolled in the program.

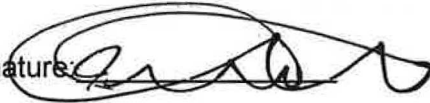
**How will program resources be reallocated? (i.e. faculty and administrative positions; infrastructure, etc.):**

Not applicable.

**Is this program in an ABOR designated high demand field ?      YES      NO**

Is the discontinued program in education, health, science, technology, engineering or math (STEM)?

Executive Director Signature:



Date: 2/13/2023

**ACADEMIC DEVELOPMENT PLAN: PROGRAM CHANGES  
2023-2024**

**Request to Disestablish an Academic Program**

University: Arizona State University

<b>Name of Academic Program:</b>  MA in Policy Advocacy
<b>Academic Department:</b>  Watts College of Public Service and Community Solutions
<b>Geographic Site:</b>  None
<b>Instructional Modality:</b>  Digital immersion only
<b>Last Term of operation:</b>  Fall 2023
<b>Brief Program Description:</b>  This MA in policy advocacy is an applied degree program oriented to those interested in acquiring the necessary skills to become effective agents of policy change.
<b>Reason for Disestablishing the Program:</b>  In discussions with potential students by the college recruitment team and faculty, there was confusion over the purpose and need for the program. It was determined that students interested in careers within the public policy field would be better suited with other similar graduate degrees already offered in our college.  Current research trends focus on policy development and analysis. These areas and many of the learning concepts and outcomes included in this program are covered quite extensively by existing graduate programs in our college, including the Master of Public Policy and the Master of Public Administration.
<b>Disestablishment Plan</b> Please explain how any students affected by the planned disestablishment of the program will be supported to earn their degree.  None, there are no students in this program.

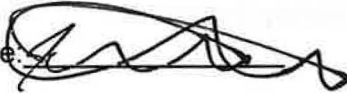
**ACADEMIC DEVELOPMENT PLAN: PROGRAM CHANGES**  
**2023-2024**

**How will program resources be reallocated? (i.e. faculty and administrative positions; infrastructure, etc.):**

Not applicable.

**Is this program in an ABOR designated high demand field ?**      **YES**      **NO**  
Is the discontinued program in education, health, science, technology, engineering or math (STEM)?

Executive Director Signature:



Date: 2/13/2022



**ACADEMIC DEVELOPMENT PLAN: PROGRAM CHANGES  
2023-2024**

**Request to Disestablish an Academic Program**

University: Arizona State University

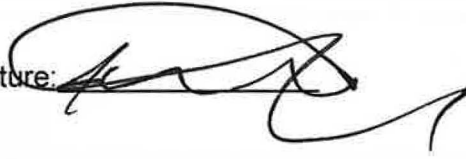
<b>Name of Academic Program:</b> BA in Community Development
<b>Academic Department:</b> Watts College of Public Service and Community Solutions <i>School of Community Resources and Development</i>
<b>Geographic Site:</b> Downtown Phoenix campus
<b>Instructional Modality:</b> Campus immersion only
<b>Last Term of operation:</b> Fall 2023
<b>Brief Program Description:</b> The BA program in community development equips students with tools to collaborate with, empower and educate diverse community constituents by drawing on grassroots and inclusive frameworks such as sustainable development, social and environmental justice, participatory democracy, social and economic equity and social accounting.
<b>Reason for Disestablishing the Program:</b> Since the program's establishment in 2020, no students have enrolled despite marketing efforts and the development of courses to stir student interest. Students prefer other degrees in Watts College of Public Service and Community Solutions.
<b>Disestablishment Plan</b> No students have enrolled in this program.
<b>How will program resources be reallocated? (i.e. faculty and administrative positions; infrastructure, etc.):</b> The resources of faculty and staff will be used to support the existing undergraduate degrees in the school, as well as graduate options in the existing Community Resources and

**ACADEMIC DEVELOPMENT PLAN: PROGRAM CHANGES**  
**2023-2024**

Development, MS and PhD degrees.

<b>Is this program in an ABOR designated high demand field ?</b>	<b>YES</b>	<b>NO</b>
Is the discontinued program in education, health, science, technology, engineering or math (STEM)?		

Executive Director Signature:



Date: 2/13/2023

# ACADEMIC DEVELOPMENT PLAN: PROGRAM CHANGES

2023-2024

## Request to Move an Academic Program

University: Arizona State University

**Name of Academic Program:**

MA in Emergency Management and Homeland Security

**Academic Department from which the program is being transferred:**

Watts College of Public Service and Community Solutions

**Academic Department to which the program is being transferred:**

Watts College of Public Service and Community Solutions

*School of Public Affairs*

**Geographic Site from which the program is being transferred:**

Downtown Phoenix campus

**Geographic Site to which the program is being transferred:**

No change

**Instructional Modality:**

Digital and campus immersion

**Brief Program Description:**

The MA program in emergency management and homeland security is designed to assist the professional development of current or future practitioners as the next generation of leaders in these fields. The program offers the following five distinct concentration areas: emergency management, homeland security, community resilience, biosecurity and threat management, and cybersecurity policy and management. These subject area specializations underscore the program's commitment to strategic thinking about current and future challenges.

**Reason for Transferring the Program:**

The MA in Emergency Management and Homeland Security program was originally developed and housed under the college's academic organization code. This program should be moved and placed within the School of Public Affairs instead of at the college level to better provide student support.

Executive Director Signature



Date: 2/13/2023

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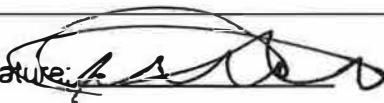
**ACADEMIC DEVELOPMENT PLAN: PROGRAM CHANGES  
2023-2024**

**Request to Move an Academic Program**

University: Arizona State University

<b>Name of Academic Program:</b>  MS in Program Evaluation and Data Analytics
<b>Academic Department from which the program is being transferred:</b>  Watts College of Public Service and Community Solutions
<b>Academic Department to which the program is being transferred:</b>  Watts College of Public Service and Community Solutions  <i>School of Public Affairs</i>
<b>Geographic Site from which the program is being transferred:</b>  Downtown Phoenix campus
<b>Geographic Site to which the program is being transferred:</b>  No change
<b>Instructional Modality:</b>  Campus and digital immersion
<b>Brief Program Description:</b>  The MS in program evaluation and data analytics is a professional degree program that emphasizes the skills needed to leverage data to improve organizational performance in the public, nonprofit and private sectors. It combines courses in program evaluation with data science classes that empower students to utilize a diverse array of tools to generate insights on social impact and leverage data in organizations.
<b>Reason for Transferring the Program:</b>  The program was originally developed and housed under the college's academic organization code. This program should be moved and placed within the School of Public Affairs instead of at the college level to better provide student support.

Executive Director Signature:



Date: 2/13/2023

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# ACADEMIC DEVELOPMENT PLAN: PROGRAM CHANGES

2023-2024

## Request to Move an Academic Program

University: Arizona State University

**Name of Academic Program:**

MPSLA in Public Safety Leadership and Administration

**Academic Department from which the program is being transferred:**

Watts College of Public Service and Community Solutions

**Academic Department to which the program is being transferred:**

Watts College of Public Service and Community Solutions

*School of Criminology and Criminal Justice*

**Geographic Site from which the program is being transferred:**

None

**Geographic Site to which the program is being transferred:**

No change

**Instructional Modality:**

Digital immersion only

**Brief Program Description:**

The MPSLA is a graduate degree program designed around the needs of public safety professionals.

This graduate program, through accomplished faculty and intricately connected curriculum, endeavors to advance student leadership, and policy and administrative acumen. Students gain skills in data analysis, organizational management and leadership, and public policy and administration. Graduates have a practical understanding of public safety organization administration.

**Reason for Transferring the Program:**

The program was originally developed and housed under the college's academic organization code. This program should be moved and placed within the School of Criminology and Criminal Justice instead of at the college level in order to provide better student support.

Executive Director Signature: 

Date: 2/13/2023





## EXECUTIVE SUMMARY

### Request to Establish New Academic Program in Arizona

**University:** Arizona State University

<b>Name of Proposed Academic Program:</b>  AA in Professional Studies
<b>Academic Department:</b>  College of Integrative Sciences and Arts
<b>Geographic Site:</b>  Downtown, Polytechnic, Tempe and West campus; Online
<b>Instructional Modality:</b>  Immersion and Online
<b>Total Credit Hours:</b>  60
<b>Proposed Inception Term:</b>  2023
<b>Brief Program Description:</b>  <p>The Associate of Arts in Professional Studies is both a valuable credential that prepares students for careers and a pathway to efficient completion of a bachelor's degree. The curriculum of the AA in Professional Studies is flexible, designed to fulfill general education requirements for a bachelor's degree while preparing students for careers or further education in one of four professional tracks:</p> <ul style="list-style-type: none"><li>• Math, Physical Sciences, Engineering and Technology</li><li>• Health and Life Sciences</li><li>• Social and Behavioral Sciences</li><li>• Humanities, Fine Arts, and Design</li></ul> <p>ASU is collaborating with the Bill &amp; Melinda Gates Foundation to co-develop a new model for degree attainment that will create new pathways to postsecondary education for students not currently attending college or university. The overall goal is always for students to pursue bachelor's degrees and beyond. The AA in Professional Studies will demonstrate to students their ability to succeed in a college-level degree program and provide a valuable stopping point that facilitates quick re-entry for those who hit unanticipated hurdles.</p>

**EXECUTIVE SUMMARY**

The curriculum of the Associate of Arts in Professional Studies is modeled after the long-standing, non-degree-awarding exploratory academic program for bachelor-seeking undergraduate students offered by ASU's University College. During the program, students will be exposed to the foundational skills and concepts needed for success that can lead to over 400+ bachelor degrees at ASU. The curricular program is designed to meet learners where they are, and provide deep interpersonal exploration, paired with experiential learning opportunities.

**Learning Outcomes and Assessment Plan:**

**Learning Outcome 1:** Students will demonstrate associate degree-level proficiency in written communication including the ability to use technology in communicating with diverse audiences for a variety of purposes.

- **Concepts:** audience, purpose, writing processes, critical thinking, rhetorical knowledge, research
- **Competencies:** Students will develop the rhetorical skills to write for multiple audiences across a range of purposes. Advanced writing skills will be developed through research and analysis addressing topics of interest.
- **Process:** To determine proficiency, a representative sample of students' final projects from ENG 101, ENG 102, ENG 105 or ENG 108 will be reviewed by faculty using faculty-designed rubrics and summarized in an annual report. The project directions will identify purpose, audience, and writing situation, and the project will involve sustained writing engagement and research. Performance metrics will be disseminated to program faculty to guide program revisions. Assessment results will be used to continuously improve the first-year composition courses with a particular focus on integrating a broad range of disciplines and methodologies.
- **Measures:** In ENG 101: First Year Composition, students will compose a variety of written works demonstrating the ability to express ideas effectively for a variety of personal and professional purposes, audiences, and occasions. At least 80% of the students will earn a rating of at least "mastery" for their final project on the following five-point scale: 1=failing 2=unsatisfactory 3=adequate 4=mastery 5=superior). In ENG 102: First Year Composition, students will demonstrate the ability to research a topic of their choice and present an argument in writing in their final project. At least 80% of the students will earn a rating of at least "mastery" on the following five-point scale: 1=failing 2=unsatisfactory 3=adequate 4=mastery 5=superior

**Learning Outcome 2:** Students will be able to communicate how quantitative data, interpretations, or models are connected to outcomes, predictions, decisions, explanations, or future states

**EXECUTIVE SUMMARY**

- **Concepts:** quantitative reasoning, data, hypotheses, models, assumptions, data-informed decision-making
- **Competencies:** Students will develop quantitative reasoning skills and the fluency to communicate in quantitative contexts. They will learn to apply relevant mathematical, statistical, computational, and visualization methods in academic, social and personal settings.
- **Process:** To determine proficiency, artifacts from quantitative reasoning, or scientific thinking courses will be evaluated using a faculty-designed rubric. Student mastery will be rated based on the above five-point scale outlined in Learning Outcome 1. A report of student outcomes will be shared with program faculty to facilitate continuous improvement.
- **Measures:** A representative sample of student-generated course artifacts will be collected and reviewed by program faculty. Faculty-designed rubrics will be used to evaluate students' quantitative reasoning skills. Faculty will review and analyze the results and develop the annual assessment report. Performance metrics will be disseminated to program faculty to guide program revisions. The goal of this process is to continuously improve individual courses, the integration of various disciplines and methodologies into the UNI courses, and the overall student experience.

**Learning Outcome 3:** Students will develop an academic plan outlining the skills and competences they seek to acquire in a bachelor's degree aligned with their career interests and values.

- **Concepts:** skills, competencies, values, metacognition, lifelong learning, future thinking, career management, self-awareness
- **Competencies:** Using a futures-thinking framework, students evaluate their own career preferences and values, research academic options, and think critically about multiple possible futures. Students will explore and reflect upon various assessment tools, to identify interests that align with various major and career pathways.
- **Process:** A representative sample of student-generated academic plan course artifacts will be collected from UNI 270: Major and Career Exploration. Faculty will review and analyze the results and develop the annual assessment report. Performance metrics will be disseminated to program faculty to guide program revisions. The goal of this process is to continuously improve individual courses, the integration of various disciplines and methodologies into courses, and the overall student experience.

**EXECUTIVE SUMMARY**

- **Measures:** Students will research the knowledge and skills needed for a possible major or career, analyze personal barriers to these pathways, design and present “action plans” to overcome these barriers. At least 80% of the students will earn a rating of at least "mastery" on the following five-point scale: 1=failing 2=unsatisfactory 3=adequate 4=mastery 5=superior.

**Projected Enrollment for the First Three Years:**

Year 1: 50

Year 2: 100

Year 3: 200

**Evidence of Market Demand:**

The U.S. Bureau of Labor Statistics predicts faster growth of employment opportunities for holders of an associate degree (11% over the period 2016-2026) than overall job growth (7%). Similarly, median weekly income for associate degree holders (\$938 in 2020) is significantly higher than those holding only a high school diploma (\$781).

The U.S. Bureau of Labor Statistics Occupational Outlook Handbook estimates that employment in occupations connected to the exploratory tracks included in this degree will grow at the following rates from 2020-2030:

- Math, Physical Sciences, Engineering and Technology: 7-11%
- Health and Life Science : 10-16%
- Social and Behavioral Sciences: 12-17%
- Humanities, Fine Arts, and Design: 8-11%

**Similar Programs Offered at Arizona Public Universities:**

Neither of the other Arizona Public Universities offers associate degrees.

**Objection(s) Raised by Another Arizona Public**

**University?** YES NO

Has another Arizona public university lodged a written objection to the proposed program with the proposing university and the Board of Regents within seven days of receiving notice of the proposed program?

**If Yes, Response to Objections:**

Please provide details of how the proposing university has addressed the objection. If the objection remains unresolved, please explain why it is in the best interests of the university system and the state that the Board override it.

**EXECUTIVE SUMMARY****New Resources Required? (i.e. faculty and administrative positions; infrastructure, etc.):**

Internal resources already allocation to the College of Integrative Sciences and Arts will be reallocated to launch this program and student enrollment will support growth.

**Program Fee/Differentiated Tuition Required?**

YES

**NO****Estimated Amount:** None**Program Fee Justification:** None**Specialized Accreditation?**

YES

**NO****Accreditor:** None

## EXECUTIVE SUMMARY

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**Item Name:** Request for New Academic Program for Arizona State University

☒ Action Item

**Requested Action:** Arizona State University asks the board to approve the new academic program request effective in the 2023-2024 catalog year.

### Background/History of Previous Board Action

As provided in the board policy, new academic program requests may be submitted throughout the year with the approval of the Academic Affairs and Educational Attainment Committee.

### Discussion

ASU requests the board approve the two-year Associate of Science in Logistics degree in partnership with the United States Navy. Enrollment in this degree will be limited to enlisted sailors, marines and coast guards. The board has previously approved two other ASU associate degrees developed for this population – the Associate of Arts in Military Studies and the Associate of Arts in Organizational Leadership.

### Committee Review and Recommendation

The Academic Affairs and Educational Attainment Committee reviewed this item at its June 1, 2023 meeting and recommended forwarding the item to the full board for approval.

### Statutory/Policy Requirements

ABOR Policy 2-223 “Academic Locations, Degree Programs and Organizational Units”

### Contact Information:

Nancy Gonzales, ASU  
Chad Sampson, ABOR

[nancy.gonzales@asu.edu](mailto:nancy.gonzales@asu.edu)  
[chad.sampson@azregents.edu](mailto:chad.sampson@azregents.edu)

480-965-9585  
602-229-2512

## EXECUTIVE SUMMARY

### Request to Establish New Academic Program in Arizona

University: Arizona State University

<b>Name of Proposed Academic Program:</b> Associate of Science in Logistics
<b>Academic Department:</b> W. P. Carey School of Business
<b>Geographic Site:</b> Tempe, West, Downtown, Polytechnic campus
<b>Instructional Modality:</b> Immersion and Digital Immersion
<b>Total Credit Hours:</b> 60
<b>Proposed Inception Term:</b> Fall 2023
<b>Brief Program Description:</b> <p>Designed through a partnership between ASU and the US Naval Community College, the Associate of Science in Logistics will allow enlisted personnel access to ASU's robust learning technology, student support and quality curriculum designed by ASU faculty.</p> <p>The AS in Logistics program examines the theories, concepts, and components of logistics, with particular attention to serving/supporting maritime and military logistics operations. Additionally, students will gain an understanding of logistics and supply chain management, communication, financial management and accounting, analytics, and the managerial skills necessary to be successful in maritime and military logistics, as well as in private industry.</p> <p>Students will be prepared for positions in the field of transportation, distribution/warehousing, and purchasing across all sectors – private, nonprofit, government and military.</p> <p>The AS in Logistics will map directly into several relevant baccalaureate degrees at ASU, including the BA in Applied Business and Technology Solutions (which offers a supply chain specialization), and the BA in Entrepreneurial Leadership. These direct pathways within ASU allow students to transition from completion of the associate degree directly into a 4-year degree without any loss of credit and without changing institutions.</p>
<b>Learning Outcomes and Assessment Plan:</b>  <b>Learning Outcome 1:</b> Students will demonstrate the ability to apply foundational theories, principles and strategies of supply chain logistics and its functional areas and how they relate to maritime environments and situations.

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- **Concepts:** principles and theories of logistics and supply chain (e.g. integration and operations, and lean practices, theory of constraints, quick response manufacturing), interaction between logistics and other business functions, predictive analytics
- **Competencies:** Students will be able to describe how logistics relates to service, costs, return on investment, customer satisfaction, and define functional areas of logistics, such as transportation, distribution, inventory management outline how supply chain can influence business decisions.
- **Assessment Methods:** Assessment will be done in the Logistics for the Maritime Environment course. Within the final exam, questions will have been identified and tagged to determine whether a student is proficient in discipline-specific knowledge for assessment purposes. In addition to this direct measure, students will complete the Graduating Student Report Card survey as they exit ASU with a question regarding the degree to which the program provided the student with job-related skills and industry knowledge. The goal is that at least 75% of our students will answer 7 of 10 questions correctly and 75% or more of students will select Quite a Bit or Very Much on the survey.
- **Measures:** The results from these direct and indirect measures will be shared with the assessment program representative. A summary of all results will be compiled for the program by the director of assessment and shared with departmental and school leadership, as well as the undergraduate curriculum committee. These groups will review results to consider the health of the program and determine opportunities for improvement.

**Learning Outcome 2:** Students will be able to explain the relationship between financial accounting, and supply chain activities and organizations.

- **Concepts:** generally accepted accounting principles; operating, investing, and financing; supply chains
- **Competencies:** Students will be able to define revenue, expenses, assets, liabilities, and equity; interpret an income statement, balance sheet, and cash flow statement; understand and apply debits vs. credits; summarize components of supply chain
- **Assessment Methods:** Assessment will be based on two exams in Society, Supply Chains and You – one exam will measure proficiency around drivers of supply chains; the other will measure proficiency around the relationship between financial accounting and supply chains. These exams will have questions tagged specifically for assessment purposes, with a target that 75% of students will respond correctly to 70% of the identified questions on each of the exams.
- **Measures:** Results for these direct measures will be compiled by the director of assessment, along with results of Learning Outcomes 1 and 3, and shared with



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departmental and school leadership to be reviewed for potential changes and enhancements to the program.

**Learning Outcome 3:** Students will demonstrate appropriate business communication skills in a written assignment.

- **Concepts:** readability, mechanics, organized writing
- **Competencies:** Students will write clearly and concisely; use appropriate grammar, spelling, and punctuation; apply logical structure to writing for easy comprehension.
- **Assessment Methods:** Assessment of communication skills will be conducted using a written assignment in Maritime Logistics Application Capstone. Students will read a business case study/article/scenario and respond to a prompt. The written response will be graded for content, but 25% of the assignments will also be reviewed for assessment of communication skills using a faculty-developed rubric that is built into Canvas. In addition to this direct measure, Survey results will be shared from the question on the Graduating Student Report Card regarding how much students felt ASU prepared them to write clearly and effectively. The target is 75% of our students will achieve 70% or higher on the written assignment and 75% or more will select Quite a Bit or Very Much on the exit survey.
- **Measures:** A summary of direct and indirect measures results will be compiled, with results for the discipline specific knowledge in business communication and will be shared with program and school leadership. These groups will review the results to consider the overall health of the program, as well as determine how the program could be improved.

**Projected Enrollment for the First Three Years:**

Year 1: 100

Year 2: 150

Year 3: 200

**Evidence of Market Demand:**

The market demand for this degree has been determined via a partnership with the US Navy. The Bureau of Labor Statistics indicates that the career of “logisticians” is projected to grow 28% in the next ten years, much faster than average for all occupations. About 24,800 openings for logisticians are projected each year, on average, over the decade.

**Similar Programs Offered at Arizona Public Universities:**

The University of Arizona offers a BSBA in Operations and Supply Chain Management. Northern Arizona University offers a BAS in Applied Science – Logistics and Supply Chain Management, and a BBA in Logistics and Supply Chain Management. Since this program is specifically designed for students in the US Naval Community College, no negative impact to other programs is expected.

**Objection(s) Raised by Another Arizona Public University? YES NO**

Has another Arizona public university lodged a written objection to the proposed program with the proposing university and the Board of Regents within seven days of receiving notice of the proposed program?

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**If Yes, Response to Objections:**

Please provide details of how the proposing university has addressed the objection. If the objection remains unresolved, please explain why it is in the best interests of the university system and the state that the Board override it.

**New Resources Required? (i.e. faculty and administrative positions; infrastructure, etc.):**

No new resources will be required to support this program which will be managed initially by existing faculty.

**Plan to Request Program Fee/Differentiated Tuition?** YES NO  
**Estimated Amount:** N/A

**Program Fee Justification:** None

**Specialized Accreditation?** YES NO

**Accreditor:**