BOARD OF TRUSTEES

Academic & Student Affairs Committee

Wednesday, February 8, 2023
10:30 AM – 12:00 PM

Virtual via WebEx

Dial in: 1-415-655-0001 | Access code: 2424 799 7624#

MEMBERS

Dr. David Williams, Chair	Dr. Narendra Kini, Vice Chair	Dr. Laine Powell
Dr. Susan LeFrancois	Melia Rodriguez	Lyn Stanfield

AGENDA

I.	Call to Order	Dr. David Williams, Chair
II.	Roll Call	Zaira Medina
III.	Public Comment	Dr. David Williams
IV.	Approval of the November 15, 2022 Minutes *Action Required*	Dr. David Williams
V.	2020-22 Academic & Student Affairs Committee Work Plan Review	Dr. Terry Parker EVP & Provost
VI.	Provost's Report	Dr. Terry Parker
	A. Academic Calendar (AY+1 and AY+2) *Action Required*	Dr. Terry Parker
	B. Approval of Two New Degrees: Civil Engineering and Industrial Engineering *Action Required*	Dr. Terry Parker
	C. Graduate Student Tuition Waiver *Action Required*	Dr. Terry Parker
	D. Student Success Plan Status Review and Report Approval *Action Required*	Dr. Terry Parker
	E. Regional Accreditation Discussion	Dr. Tom Dvorske Vice Provost Academic Affairs
	F. All Other Academic and Student Affairs Discussion Items	Dr. Terry Parker
VII.	Closing Remarks and Adjournment	Dr. David Williams

BOARD OF TRUSTEES

Academic & Student Affairs Committee Meeting

DRAFT MEETING MINUTES

Tuesday, November 15, 2022
10:30 AM – 12:00 PM

Florida Polytechnic University
Applied Research Center & via WebEx

I. Call to Order

Committee Vice Chair Narendra Kini called the Academic and Student Affairs Committee meeting to order at 10:04 a.m.

II. Roll Call

Zaira Medina called the roll: Committee Vice Chair Narendra Kini, Trustee Laine Powell, Trustee Susan LeFrancois, Trustee Melia Rodriguez, Trustee Lyn Stanfield were present (Quorum)

Other Trustees Present: Board Chair Cliff Otto, Trustee Mark Bostick, Trustee Gary Wendt, and Trustee Bob Stork

Staff Present: President Randy Avent, Provost Terry Parker, Dr. Allen Bottorff, David Fugett, Mike Dieckmann, Kathy Bowman, David Blanton, Dr. Kathryn Miller, Dr. Tom Dvorske, Maggie Mariucci and Kristen Wharton

III. Public Comment

There were no requests received for public comment.

IV. Approval of Minutes

Trustee Melia Rodriguez made a motion to approve the Academic and Student Affairs Committee meeting minutes of September 21, 2022. Trustee Lyn Stanfield seconded the motion; a vote was taken, and the motion passed unanimously.

V. 2020-22 Academic & Student Affairs Committee Work Plan Review

Committee Chair Kini reviewed the Academic and Student Affairs Committee Work plan. There was no discussion on this item.

VII. Provost Report

A. Regulation FPU-3.006 Student Code of Conduct

The revised regulation clarifies that actions that constitute expressive activities are not misconduct, when medical and hazing amnesty can be applied, the hearing process for interim suspension, and how the Student Code of Conduct interacts with other relevant University policies.

Trustee Lyn Stanfield made a motion to recommend approval of the revised regulation FPU-3.006 Student Code of Conduct to the Board of Trustees. Trustee Melia Rodriguez seconded the motion; a vote was taken, and the motion passed unanimously.

B. FIPR Institute Annual Report FY22

Provost Parker presented the annual Florida Industrial and Phosphate Research Institute (FIPR) report for fiscal year 2022. FIPR's severance tax income has decreased over the past several years. This loss of income has been balanced with contract funds. For fiscal year 2022, the Institute's net income is $122,377.

Trustee Gary Wendt inquired if there are any current projects on the removal of phosphate from Florida waterways. Provost Parker responded the research for using biochar relates directly to removing phosphate from both processed and runoff waters.

Committee Chair Kini inquired if there is an opportunity for development of intellectual property or patents for the University. Provost Parker responded in the affirmative stating the University is in the process of applying for patent protections on two projects: the Packed Column Jig, and the use of phosphogypsum stack materials for road base. Committee Chair Kini inquired if this allows the University to research joint venture or other monetization possibilities. President Randy Avent replied once the projects mature and are proven to work, the University will seek partners to license them.

Trustee Laine Powell made a motion to recommend approval of the Florida Institute of Phosphate Research Annual Report for fiscal year 2022 to the Board of Trustees. Trustee Lyn Stanfield seconded the motion; a vote was taken, and the motion passed unanimously.

C. Advanced Mobility Institute Annual Report FY22

President Avent presented the first annual Advanced Mobility Institute (AMI) report for fiscal year 2022. The Florida state legislature awarded the Institute $1M for use over two years, with only $146,660 expended in fiscal year 2022.

Committee Chair Kini inquired if development of a universal charger for electrical vehicles is underway. President Avent responded it is a standardization issue; the Institute for Electronic and Electrical Engineers (IEEE) will be the entity to establish this standardization.

Trustee Susan LeFrancois inquired if a faculty member will manage the equipment and the students' projects. She also asked if this Institute will be incorporated into the University's curriculum. President Avent responded his office currently oversees the program, and curriculum integration is at the discretion of the faculty members engaged in AMI and their department chairs. He does not foresee a specific program/degree in autonomous or electrical vehicles.

Trustee Wendt asked if the million-dollar grant is part of the University budget. President Avent responded in the affirmative. As AMI did not spend all of the appropriation, the balance was moved into the University's carryforward funds. Trustee Lyn Stanfield inquired if there are any concerns with the underspending of funds. President Avent stated the majority of the funds have been expensed over the two years.

Trustee Melia Rodriguez made a motion to recommend approval of the Advanced Mobility Institute Annual Report for fiscal year 2022 to the Board of Trustees. Trustee Laine Powell seconded the motion; a vote was taken, and the motion passed unanimously.

D. Student Success Plan Status Review

Provost Parker reviewed progress made on the University's Student Success Plan which is required by the BOG. Trustee Bob Stork inquired how achieving high marks in Performance Based Funding (PBF) helps the University be a better institution versus achieving them simply to obtain funding. Provost Parker responded this system of metric achievement has improved the University, particularly in retention and graduation rates.

Trustee Stork further inquired how growing and supporting the Graduate program assists the University versus having the Institution's attention on something else. Provost Parker responded that having a healthy Graduate program is important to support faculty and senior-level students from Florida Poly's undergraduate programs.

Trustee Stanfield asked for additional information on metric number seven: University Access Rate. Provost Parker responded this metric is measured by the percentage of Pell students enrolled at the University and must be balanced carefully. President Avent stated Florida Poly's percentage of 30% Pell students is higher than its peers, yet lower than the rest of the institutions in the SUS as Florida Poly is not a comprehensive university.

Provost Parker also reviewed admissions for Fall 2023, as well as various Student Affairs and Student Life activities. He announced two new Bachelor of Science degree programs, Civil Engineering and Industrial Engineering, which will be formally presented to the Board in February 2023. The goal is to offer these degrees to incoming first-year students in fall 2024.

Provost Parker stated rental rates for Phase II housing will increase by 7%; the University expects Phase I rental rates will also increase by 7%. Chair Otto inquired when rates were last increased. Last year there was a 2.25% increase, which is according to the contract.

Provost Parker reviewed SB7044, specifically the portion regarding changing accrediting agencies. Trustee Laine Powell inquired about the timeline for this process. Following a reaffirmation decision from SACSCOC in December, the University will send a letter of intent to change accreditors to the Department of Education (DOE). Once the DOE accepts the University's proposal, the new accreditation process will begin with another accreditor.

Trustee LeFrancois expressed the concern among SUS faculty senates regarding the requirement of post-tenure review in SB7044 and the ability to attract qualified faculty to the state of Florida. Provost Parker responded this legislation was written specifically for tenure campuses; Florida Polytechnic University and Florida Gulf Coast University are non-tenure campuses. However, this regulation requires Florida Poly to adhere to additional review processes in addition to the ones already in place.

Chair Otto inquired if the faculty job market is improving. Provost Parker responded it depends on the field. The applicant pool for Computer Science candidates is mixed, while the pool for Engineering Physics candidates has been particularly good.

Trustee Stork inquired how not having tenure affects Florida Poly's faculty. President Avent responded the strong faculty leave because they can, but not because the University does not offer tenure.

VIII. Closing Remarks and Adjournment

With no further business to discuss, the Academic and Student Affairs Committee Meeting adjourned at 11:12 a.m.

AGENDA ITEM: V.

Florida Polytechnic University

Academic and Student Affairs Committee

Board of Trustees

February 8, 2023

Subject: 2022-2024 Academic and Student Affairs Committee Work Plan

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Proposed Committee Action

Review only. No action required.

Background Information

Provost Terry Parker will review the Committee's 2022-2024 Work Plan.

Supporting Documentation: Academic and Student Affairs Committee Work Plan 2022-2024

Prepared by: Dr. Terry Parker, EVP and Provost

Committee Work Plan

Academic & Student Affairs Committee Work Plan 2022-2024

SEPTEMBER

- Academic & Student Affairs Committee Charter *(review and approve every two years – due September 2022)*
- Civil Discourse: Initial review of student orientation programming and student code of conduct
- Annual Textbook and Instructional Materials Affordability Report *(review and approve)*
- Renewal of Out of State Fee Waiver *(review and approve)*
- Institutional Accreditation Activity *(review as needed)*
- Admissions and Financial Aid *(review as needed)*
- Student Services *(review as needed)*
- Four-year graduation improvement plan *(review as needed)*
- Degree Program Additions and Faculty Hiring *(review as needed)*
- Student and Faculty Diversity *(review as needed)*
- Graduate programs *(review as needed)*
- Technology and Pedagogy *(review as needed)*

NOVEMBER

- Advanced Mobility Institute Annual Report *(review and approve)*
- FIPR Institute Annual Report *(review and approve)*
- FIPR Institute Seven-Year Review *(review and approve)*
- Revision of student code of conduct *(review and approve)*
- Institutional Accreditation Activity *(review as needed)*
- Admissions and Financial Aid *(review as needed)*
- Student Services (review as needed)
- Four-year graduation improvement plan *(review as needed)*
- Degree Program Additions and Faculty Hiring *(review as needed)*
- Student and Faculty Diversity *(review as needed)*
- Graduate programs *(review as needed)*
- Technology and Pedagogy *(review as needed)*

FEBRUARY

- CITF Increase, Inc. to Existing Fees or New Fees *(review and approve only if changes are proposed)*
- Academic Calendar (AY+1 and AY+2) *(review and approve)*
- Institutional Accreditation Activity *(review as needed)*
- Admissions and Financial Aid *(review as needed)*
- Student Services (review as needed)
- Four-year graduation improvement plan *(review as needed)*
- Degree Program Additions and Faculty Hiring *(review as needed)*
- Student and Faculty Diversity *(review as needed)*
- Graduate programs *(review as needed)*
- Technology and Pedagogy *(review as needed)*

APRIL

- University Accountability Report *(review and approve)*

JUNE

- Civil Discourse: Annual review of student orientation programming and student code of conduct
- Institutional Accreditation Activity *(review as needed)*
- Admissions and Financial Aid *(review as needed)*
- Student Services (review as needed)
- Four-year graduation improvement plan *(review as needed)*
- Degree Program Additions and Faculty Hiring *(review as needed)*
- Student and Faculty Diversity *(review as needed)*
- Graduate programs *(review as needed)*
- Technology and Pedagogy *(review as needed)*

AGENDA ITEM: VI.A.1.

Florida Polytechnic University
Board of Trustees
Academic & Student Affairs Committee
February 8, 2023

Subject: **Approval of the Proposed Final 2023-24 Academic Calendar**

Proposed Committee Action

Recommend approval of the proposed final 2023-2024 Academic Calendar to the Board of Trustees.

Background Information

Purpose:

Per BOG Regulation 8.001 University Calendars, each university shall adopt an annual calendar to be filed with the BOG by March 1 prior to the start of the academic year. By practice, the University approves the calendar for the upcoming academic year and also provides a tentative calendar for following academic year.

Background Information:

The dates noted on the following page for the 2023-24 Academic Year Calendar were previously approved by the Board on February 16, 2022, as tentative dates. While these dates have not changed there was a typo identified in the previously approved calendar where the Summer "A" 2024 First Day of Classes was noted as 5/3/2023 rather than 5/13/2023. We are requesting Board approval to file this adjustment to the BOG using their requested format. The Academic Year dates follow the requirements of the regulation and notes the specific activity/event items requested by the BOG for their purposes.

As a note, the file submission format and activity/event items requested this year are the same format as last year.

Supporting Documentation: Proposed Final 2023-2024 Academic Calendar

Prepared by: Andrew Konapelsky, University Registrar; Dr. Terry Parker, EVP & Provost

Academic Calendar for 2023-2024

Term	Activity/Event	Start Date	End Date (If Applicable)
Fall 2023	Resident Move-In	8/18/2023	
Fall 2023	First Day of Classes	8/22/2023	
Fall 2023	Breaks - *Labor Day Holiday*	9/4/2023	
Fall 2023	Breaks - *Veteran's Day Holiday (observed)*	11/10/2023	
Fall 2023	Breaks - *Thanksgiving Holiday Break*	11/22/2023	11/24/2023
Fall 2023	Last Day of Classes	12/6/2023	
Fall 2023	Final Examinations	12/9/2023	12/14/2023
Fall 2023	Commencement	5/5/2024	
Spring 2024	First Day of Classes	1/8/2024	
Spring 2024	Breaks - *Martin Luther King Jr. Holiday*	1/15/2024	
Spring 2024	Breaks - *Career Day*	2/13/2024	
Spring 2024	Breaks - *Spring Break*	3/2/2024	3/10/2024
Spring 2024	Last Day of Classes	4/24/2024	
Spring 2024	Final Examinations	4/27/2024	5/2/2024
Spring 2024	Resident Move-Out	5/4/2024	
Spring 2024	Commencement	5/5/2024	
Summer "A" 2024	First Day of Classes	5/13/2024	
Summer "A" 2024	Breaks - *Memorial Day*	5/27/2024	
Summer "A" 2024	Last Day of Classes	6/21/2024	
Summer "A" 2024	Final Examinations	In class	
Summer "B" 2024	First Day of Classes	7/1/2024	
Summer "B" 2024	Breaks - *Independence Day*	7/4/2024	
Summer "B" 2024	Last Day of Classes	8/9/2024	
Summer "B" 2024	Final Examinations	In class	
Summer "C" 2024	First Day of Classes	5/13/2024	
Summer "C" 2024	Breaks - *Memorial Day*	5/27/2024	
Summer "C" 2024	Breaks - *Summer Break*	6/24/2024	6/28/2024
Summer "C" 2024	Breaks - *Independence Day*	7/4/2024	
Summer "C" 2024	Last Day of Classes	8/9/2024	
Summer "C" 2024	Final Examinations	In class	
Summer "D" 2024	First Day of Classes	6/10/2024	
Summer "D" 2024	Breaks - *Independence Day*	7/4/2024	
Summer "D" 2024	Last Day of Classes	8/9/2024	
Summer "D" 2024	Final Examinations	In class	
Summer 2024	Commencement	5/5/2024	

Institution Name:	Florida Polytechnic University

AGENDA ITEM: VI.A.2.

Florida Polytechnic University

Board of Trustees

Academic & Student Affairs Committee

February 8, 2023

Subject: Approval of the Tentative 2024-25 Academic Calendar

Proposed Committee Action

Recommend approval of the Tentative Academic Year Calendar for 2024-25 to the Board of Trustees.

Background Information

Purpose:

Per BOG Regulation 8.001 University Calendars, each university shall adopt an annual calendar to be filed with the BOG by March 1 prior to the start of the academic year. By practice, the University approves the calendar for the upcoming academic year and also provides a tentative calendar for following academic year.

Background Information:

The dates noted on the following page for the 2024-25 Academic Year Calendar are tentative dates for planning purposes. These dates follow regular campus operations and should remain unchanged, barring any unforeseen circumstances. Any adjustments required will be submitted to the Board in 2024 for final approval before filing to the BOG.

The Academic Year dates follows the requirements of the regulation and notes the current activity/event items requested by the BOG for their purposes.

Supporting Documentation: Proposed Tentative 2024-2025 Academic Calendar

Prepared by: Andrew Konapelsky, University Registrar; Dr. Terry Parker, EVP & Provost

Academic Calendar for 2024-2025

Term	Activity/Event	Start Date	End Date (If Applicable)
Fall 2024	Resident Move-In	8/16/2024	
Fall 2024	First Day of Classes	8/20/2024	
Fall 2024	Breaks - *Labor Day Holiday*	9/2/2024	
Fall 2024	Breaks - *Veteran's Day Holiday*	11/11/2024	
Fall 2024	Breaks - *Thanksgiving Holiday Break*	11/27/2024	11/29/2024
Fall 2024	Last Day of Classes	12/4/2024	
Fall 2024	Final Examinations	12/7/2024	12/12/2024
Fall 2024	Commencement	5/4/2025	
Spring 2025	First Day of Classes	1/6/2025	
Spring 2025	Breaks - *Martin Luther King Jr. Holiday*	1/20/2025	
Spring 2025	Breaks - *Career Day*	2/11/2025	
Spring 2025	Breaks - *Spring Break*	3/1/2025	3/9/2025
Spring 2025	Last Day of Classes	4/23/2025	
Spring 2025	Final Examinations	4/26/2025	5/1/2025
Spring 2025	Resident Move-Out	5/3/2025	
Spring 2025	Commencement	5/4/2025	
Summer "A" 2025	First Day of Classes	5/12/2025	
Summer "A" 2025	Breaks - *Memorial Day*	5/26/2025	
Summer "A" 2025	Last Day of Classes	6/20/2025	
Summer "A" 2025	Final Examinations	In class	
Summer "B" 2025	First Day of Classes	6/30/2025	
Summer "B" 2025	Breaks - *Independence Day*	7/4/2025	
Summer "B" 2025	Last Day of Classes	8/8/2025	
Summer "B" 2025	Final Examinations	In class	
Summer "C" 2025	First Day of Classes	5/12/2025	
Summer "C" 2025	Breaks - *Memorial Day*	5/26/2025	
Summer "C" 2025	Breaks - *Summer Break*	6/23/2025	6/27/2025
Summer "C" 2025	Breaks - *Independence Day*	7/4/2025	
Summer "C" 2025	Last Day of Classes	8/8/2025	
Summer "C" 2025	Final Examinations	In class	
Summer "D" 2025	First Day of Classes	6/9/2025	
Summer "D" 2025	Breaks - *Independence Day*	7/4/2025	
Summer "D" 2025	Last Day of Classes	8/8/2025	
Summer "D" 2025	Final Examinations	In class	
Summer 2025	Commencement	5/4/2025	

Institution Name:	Florida Polytechnic University

AGENDA ITEM: VI.B.1.

Florida Polytechnic University

Board of Trustees

Academic & Student Affairs Committee

February 8, 2023

<u>Subject:</u> Approval of the Proposed Degree Program: B.S. Civil Engineering

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Proposed Committee Action

Recommend approval of the proposed degree program, Bachelor of Science in Civil Engineering, to the Board of Trustees.

Background Information

The formal degree proposal is included with this agenda item sheet.

Supporting Documentation: Bachelor of Science in Civil Engineering

Prepared by: Dr. Tom Dvorske, Vice Provost Academic Affairs; Dr. Terry Parker, EVP & Provost

STATE UNIVERSITY
SYSTEM OF FLORIDA

Board of Governors, State University System of Florida

REQUEST TO OFFER A NEW DEGREE PROGRAM

In Accordance with BOG Regulation 8.011

(Please do not revise this proposal format without prior approval from Board staff)

Florida Polytechnic University
Institution Submitting Proposal

Fall 2023
Proposed Implementation Term

Name of College(s) or School(s)

Civil and Environmental Engineering Department
Name of Department(s)/Division(s)

Civil Engineering
Academic Specialty or Field

Bachelor of Science in Civil Engineering
Complete Name of Degree

14.0801
Proposed CIP Code (2020 CIP)

The submission of this proposal constitutes a commitment by the university that, if the proposal is approved, the necessary financial resources and the criteria for establishing new programs have been met prior to the initiation of the program.

Date Approved by the University Board of Trustees

2/7/23
President's Signature **Date**

Board of Trustees Chair's Signature **Date**

02/03/2023
Provost's Signature **Date**

PROJECTED ENROLLMENTS AND PROGRAM COSTS

Provide headcount (HC) and full-time equivalent (FTE) student estimates for Years 1 through 5. HC and FTE estimates should be identical to those in Appendix A – Table 1. Indicate the program costs for the first and the fifth years of implementation as shown in the appropriate columns in Appendix A – Table 3A or 3B. Calculate an Educational and General (E&G) cost per FTE for Years 1 and 5 by dividing total E&G by FTE.

Implementation Timeframe	HC	FTE	E&G Cost per FTE	E&G Funds	Contract & Grants Funds	Auxiliary/ Philanthropy Funds	Total Cost
Year 1	23	20	$44,649.90	$892,998	0	0	$892,998
Year 2	46	44					
Year 3	94	68					
Year 4	119	80					
Year 5	150	134	$10,074.51	$1,349,984	0	0	**$1,349,984**

Additional Required Signatures

I confirm that I have reviewed and approved Need and Demand Section III.F. of this proposal.

Gloria Nelson

Signature of Equal Opportunity Officer

January 23, 2023

Date

I confirm that I have reviewed and approved Non-Faculty Resources Section VIII.A. and VIII.B. of this proposal.

Kathryn M. Miller

Signature of Library Dean/Director

1-23-2023

Date

Introduction

I. Program Description and Relationship to System-Level Goals

A. Describe within a few paragraphs the proposed program under consideration, and its overall purpose, including:

- **degree level(s)**
- **majors, concentrations, tracks, specializations, or areas of emphasis**
- **total number of credit hours**
- **possible career outcomes for each major (provide additional details on meeting workforce need in Section III)**

Florida Polytechnic University proposes to add a Bachelor of Science in Civil Engineering to the degree inventory. This 120 credit hour program draws from complementary areas of research and education with our environmental engineering program and projects underway through the University's FIPR Institute. In the field of transportation, the University's Advanced Mobility Institute (AMI) provides research opportunity and collaboration in areas of autonomous vehicles and transportation technologies that support a high-tech infrastructure. With degree strengths consistent with ABET standards in areas such as environmental engineering, geotechnical engineering, and construction and project management bolstered by existing research institutes (FIPR and AMI), Civil Engineering at Florida Poly would provide a unique experience in a small campus setting within the system. Data show that demand for civil engineers in Florida outpaces all universities' ability to produce them. The American Society of Civil Engineers identifies multiple career paths in civil engineering including public (government) agencies, education, consulting, manufacturing, technology, pharmaceuticals, and more. Florida Poly's program will prepare students to, among other things, support Florida's unique and growing transportation system and expanding infrastructure.

B. If the proposed program qualifies as a Program of Strategic Emphasis, as described in the Florida Board of Governors 2025 System Strategic Plan, please indicate the category.

- **Critical Workforce**
  ☐ Education
  ☐ Health
  ☐ Gap Analysis
- **Economic Development**
  ☐ Global Competitiveness
  ☒ Science, Technology, Engineering, and Math (STEM)

☐ **Does not qualify as a Program of Strategic Emphasis.**

II. Strategic Plan Alignment, Projected Benefits, and Institutional Mission and Strength

A. Describe how the proposed program directly or indirectly supports the following:

- **System strategic planning goals (see link to the 2025 System Strategic Plan on the New Program Proposals & Resources webpage)**
- **the institution's mission**
- **the institution's strategic plan**

Florida Poly's proposed B.S. in Civil Engineering aligns with the State University System's strategic plan in several ways. Clearly it supports the plan's goal to increase STEM programs. More substantively, we emphasize the following goals:

- *Goal: Strengthen the Quality and Reputation of the Universities*
  - A civil engineering program, a staple of any engineering university, will elevate Florida Polty's status as an emerging engineering University of excellence and more closely align Poly with its aspirational peers.
- *Goal: Strengthen the Quality and Reputation of Scholarship, Research, and Innovation*
  - Specifically, Florida Poly sees its civil engineering students participating in faculty research, enhancing the University's overall research profile and preparing graduates who are well-rounded and experienced in their field upon graduation.
- *Goal: Increase Community and Business Workforce*
  - The foremost outcome of the proposed program is to produce more graduates who will find full-time employment in civil engineering and related areas or continue their education in the engineering fields.

Florida Poly's mission – *to serve students and industry through excellence in education, discovery, and application of engineering and applied sciences* – frames the core academic programming the University designs and delivers. Civil engineering, a cornerstone of any engineering institution, will add more substance to our program offerings and help ground our aspirations toward excellence.

Our current and planned Strategic Plan (2023 – 2028, in development) both emphasize growing degree programs that meet the high-tech, high-wage demand in Florida. Civil engineering at Florida Poly strongly support that plan.

B. Describe how the proposed program specifically relates to existing institutional strengths. This can include:

- **existing related academic programs**
- **existing programs of strategic emphasis**
- **institutes and centers**
- **other strengths of the institution**

Broadly, Florida Poly's proposed B.S. in Civil Engineering fits nicely between existing programs in Environmental Engineering and Mechanical Engineering (with which is shares much of the first two years).

All of Florida Poly's programs fit into areas of strategic emphasis, specifically STEM. As a

100% STEM University, Florida Poly grows new programs out the existing resources – faculty, curriculum – to ensure efficiency in delivery and resources utilization as well as facilitate interdisciplinary collaboration and research.

The University's centers – Advanced Mobility Institute (AMI), and the Florida Institute for Phosphate Research (FIPR) – contribute to the program by providing research opportunities for faculty and students as well as hands-on experience working in the areas of the programs proposed concentrations.

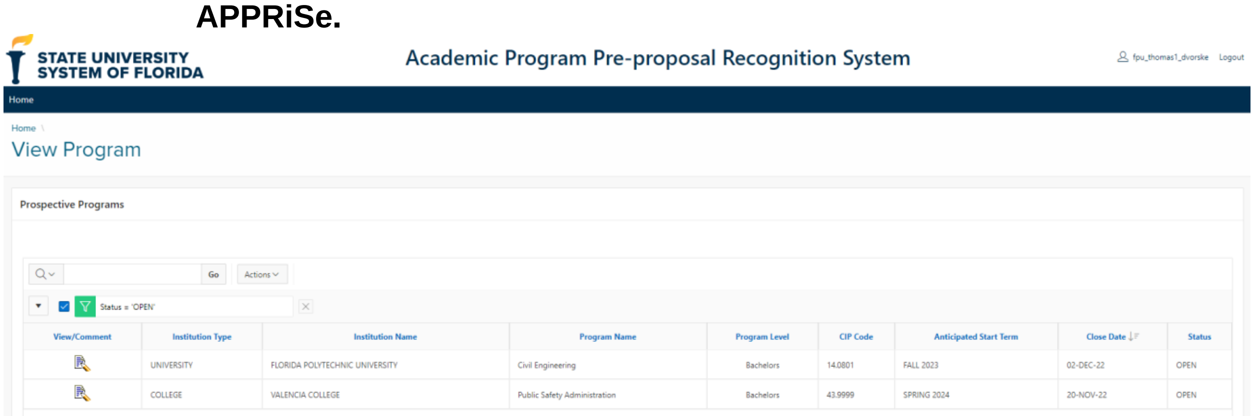
Florida Poly's newest building, the Applied Research Center (ARC), houses much of the Faculty research capacity in a 90,000 sf venue. The University also plans to build an engineering building adjacent to the ARC that will house environmental engineering and FIPR (with a presence still in Bartow, FL).

C. Provide the date the pre-proposal was presented to the Council of Academic Vice Presidents Academic Program Coordination (CAVP ACG). Specify whether any concerns were raised, and, if so, provide a narrative explaining how each concern has been or will be addressed.

Florida Poly presented the proposed program to the Council of Academic Vice Presidents – Academic Coordinating Group on November 8, 2022. No concerns were expressed and all SUS institutions were supportive of the proposal.

D. In the table below, provide a detailed overview and narrative of the institutional planning and approval process leading up to the submission of this proposal to the Board office. Include a chronology of all activities, providing the names and positions of both university personnel and external individuals who participated in these activities.

- **If the proposed program is a bachelor's level, provide the date the program was entered into the APPRiSe system, and, if applicable, provide narrative responding to any comments received from APPRiSe.**



View/Comment	Institution Type	Institution Name	Program Name	Program Level	CIP Code	Anticipated Start Term	Close Date	Status
	UNIVERSITY	FLORIDA POLYTECHNIC UNIVERSITY	Civil Engineering	Bachelors	14.0801	FALL 2023	02-DEC-22	OPEN
	COLLEGE	VALENCIA COLLEGE	Public Safety Administration	Bachelors	43.9999	SPRING 2024	20-NOV-22	OPEN

Academic Program Pre-proposal Recognition System

W web_do_not_reply@flbog.net
To Tom Dvorske

Reply | Reply All | Forward

Tue 10/18/2022 4:15 PM

Dear TOM DVORSKE,

FLORIDA POLYTECHNIC UNIVERSITY entered information for a potential bachelor's degree program in APPRiSe.

The prospective program was titled Civil Engineering in CIP code family: 14 ENGINEERING.

Please take the opportunity to review the prospective program and provide feedback, if appropriate. The comment period for this prospective program closes on December 2, 2022.

We appreciate your continued participation in the system and the benefit your knowledge contributes to the development of bachelor's degree programs in Florida.

Sincerely,

Mike Sfiropoulos
Florida College System

Christy England
Board of Governors, State University System

- **If the proposed program is a doctoral-level program, provide the date(s) of the external consultant's review in the planning table. Include the external consultant's report and the institution's responses to the report as Appendix B.**

Not Applicable

Planning Process

Date	Participants	Planning Activity Description
Fall 2020	Academic Affairs Leadership: Provost Parker; Vice Provosts – Dvorske, Miller, Corpus; Department Chairs: Vollaro (Mechanical and environmental engineering), Taj (Data Science and Business Analytics), Rashid (Electrical and Computer Engineering), Towle (Computer Science), Hickman (Math and Physics).	Preliminary discussion among Academic Affairs leadership of prospective programs in line with University's Strategic Plan
04.2020	President Avent, Cabinet (Vice Presidents – Bowman, DeIulio, Parker), Board of Trustees (Otto, Chair)	Included on the University's Accountability plan is a note that Civil Engineering is on the docket for consideration sometime in the next 2-3 years.
06.2021	President, Cabinet, Board of Trustees (see above), Academic Affairs Leadership Provost Parker; Vice Provosts – Dvorske, Miller, Corpus; Department Chairs: Vollaro (Mechanical and environmental engineering), Taj (Data Science and Business Analytics and Computer Science), Brilleslyper (Applied Mathematics), and Assistant Chairs, Demirel (Computer Science), and Sanchez (Data Science)	Civil Engineering included on the Accountability Plan with a proposed date of submission to the University Board of Trustees for May 2022.
Fall 2021	Academic Affairs Leadership: see previous.	The decision was made to focus first on developing and delivering two master's degrees and hold off for another year for CE.
Spring 2022	Vollaro, Chair, Mechanical and Environmental Engineering Department, AA Leadership (see above).	Preliminary planning for program content and focus, decision about timeline for development and implementation.
April, May 2022	Vice Provost of Academic Affairs, Tom Dvorske & Vice Provost of Enrollment, Ben Mattew Corpus	Joint propose for FY'23 budget funds to conduct marketplace and positioning research for CE and other programs.

June - Aug 2022	Vollaro, Mechanical and Environmental Engineering Department with collaboration from Taj, Dept. of Data Science and Business Analytics (DSBA) for specialized transportation concentration.	Program development continues with the intent to bring it to the University's curriculum committee in the 2022-2023 academic year.
July 2022	Vice Provost of Academic Affairs, Tom Dvorske & Vice Provost of Enrollment, Ben Mattew Corpus	Funds for R&D hit departments' budgets. Contract with Eduventures initiated with multiple meetings between July and September 2022.
Fall 2022	Vollaro, Chair, Mechanical and Environmental Department; Taj, Chair, DSBA Department	Ongoing development during faculty Welcome Back Week. Curriculum development continues through fall.
10.18.2022	Vice Provost of Academic Affairs, Tom Dvorske	APPRISE Entry – No Comments
11.08.2022	Vice Provost of Academic Affairs, Tom Dvorske	CAVP-ACG – No Comments
01.2023	Vollaro, Chair, Mechanical and Environmental Department; Taj, Chair, DSBA Department	Curriculum submitted to Undergraduate Curriculum Committee (UCC) for consideration and approval
02.2023	Provost, Terry Parker	Approves program and submits program to Board of Trustees for approval.

E. Provide a timetable of key events necessary for the implementation of the proposed program following approval of the program by the Board office or the Board of Governors, as appropriate, and the program has been added to the State University System Academic Degree Program Inventory.

Events Leading to Implementation –

Date	Implementation Activity
Assumes a April – July 2023 addition to inventory.	
June 2023	Update systems to include Civil as a Degree option
June – July 2023	Update website and develop marketing materials for recruiting
August 2023	Officially launch program for incoming freshman only

Institutional and State Level Accountability

III. Need and Demand

A. Describe the workforce need for the proposed program. The response should, at a minimum, include the following:

- **current state workforce data as provided by Florida's Department of Economic Opportunity**
- **current national workforce data as provided by the U.S. Department of Labor's Bureau of Labor Statistics**
- **requests for the proposed program from agencies or industries in your service area**
- **any specific needs for research and service that the program would fulfill**

Despite the impressive productivity out of Florida public higher-education system, annual demand for civil engineers outpaces productivity (even when including private institution productivity) by 45%, or nearly 700 unfilled openings. Moreover, over the next ten years, growth in related SOCs for Civil Engineering will rise faster (10%) than the national trend (5%). It is also one of the top three highest paying occupational groups in Florida.[3] While Civil Engineering job postings fell during the Covid-19 pandemic, data signals a strong recovery in 2022, with Florida ahead of the national trend that is expected to match or surpass 2019 peak figures for postings.

From an industry standpoint, employment in heavy and civil engineering construction in Florida and related areas will grow between 8.7 to over 14% over the next ten years. Clearly, the demand for more programs is justified by the existing gap in the workforce and projected demand over the next ten years.

Florida Poly annual research expenditures continue on a positive trend from $689,000 in FY 2020 to a projected $2,030,000 in FY 2023. Among institutionally defined peer institutions, the average research expenditure for Civil Engineering is around 2.3 million.

The program in Civil Engineering would seek ABET accreditation at the earliest possible time (upon reaching one graduate). ABET accreditation is considered essential for Civil Engineers to obtain employment and licensure.

B. Provide and describe data that support student demand for the proposed program. Include questions asked, results, and other communications with prospective students.

Students are drawn to Florida Poly for several reasons – the 100% STEM focus, the smaller campus community environment, greater affinity with peers, and the opportunity to work closely with faculty, engage in co- and extra-curriculars that appeal to their interests, and many others. The University's STEM focus enables Florida Poly to cultivate a unique student experience for highly talented, STEM-interested majors who are looking for that personal touch and strong community engagement.

Demand for Florida Poly continues to rise. Undergraduate applications have increased by 35% in 2021 and again by 45% in 2022. Not only has student demand for rigorous, quality STEM programs in small classes increased, recent empirical research has demonstrated improved

STEM academic outcomes, particularly for women, when there are small classes at small universities (Cissy, et al 2018, Bioscience). Based on data from Eduventures, the top five experiences Engineering-interested prospects are looking for are topic experiences the University offers: Internships; rigorous coursework; interactions with like-minded students, clubs, and activities; and research opportunities with faculty. This group also cares about academic strength, affordability, and career preparation. Florida Poly is low-cost to attend, and its graduates lead the system in median wages one-year after graduation.[2] The University is also recognized as the #1 public STEM University in the South.

Enrollment in Civil Engineering programs remained level during the pandemic, while overall engineering program enrollment dropped a few percentage points. Civil makes up for a relatively large share of the total engineering enrollment landscape and, despite no growth in the pandemic period, continued to outperform many other majors. Moreover, total programs nationally have grown by 19% since 2012, so while the pandemic saw a slowdown, that is expected to be temporary. National focus on infrastructure will continue to drive local, state and national demand for Civil Engineers. Conferrals in Florida have also continued to rise since 2012, with a one-time dip in 2014, though still underperforming relative to labor market demand.

1. Cissy J Ballen, Stepfanie M Aguillon, Rebecca Brunelli, Abby Grace Drake, Deena Wassenberg, Stacey L Weiss, Kelly R Zamudio, Sehoya Cotner, Do Small Classes in Higher Education Reduce Performance Gaps in STEM?, *BioScience*, Volume 68, Issue 8, August 2018, Pages 593–600, https://doi.org/10.1093/biosci/biy056
2. https://www.flbog.edu/wp-content/uploads/2022/10/2022_SYSTEM_Accountability_Plan_Final.pdf.

Anecdotally, Admissions recruiting efforts rountinely encounter prospects inquiring as to whether the University offers Civil Engineering. We do not formally communicate the program to students because it is not in our catalog or in the State Inventory.

C. Complete Appendix A – Table 1 (1-A for undergraduate and 1-B for graduate) with projected student headcount (HC) and full-time equivalents (FTE).

- **Undergraduate FTE must be calculated based on 30 credit hours per year**
- **Graduate FTE must be calculated based on 24 credit hours per year**

In the space below, provide an explanation for the enrollment projections. If students within the institution are expected to change academic programs to enroll in the proposed program, describe the anticipated enrollment shifts and impact on enrollment in other programs.

Enrollment projections are based on our experience with other recently implemented programs at the University. This typically begins with a "small" incoming class and gradually grows to a larger, sustainable enrollment. The University does not anticipate significant movement from other degree programs. The rate of major change at Poly is typically less than 3%. We will implement the program in fall 2023 for incoming first-year students only and transfer who have less than 30 credits. This method has worked for us for all of our previously implemented programs and provides students, the faculty, and the University to grow and make improvements along the way.

D. Describe the anticipated benefit of the proposed program to the university, local community, and the state. Benefits of the program should be described both quantitatively and qualitatively.

A program in civil engineering will be a draw to prospective students, increasing the University's enrollment and marketplace visibility. Bringing in a different kind of prospective engineer will also contribute to our campus culture in diversifying student interests, clubs, co-curricular activities and programs. Having more students in the local community means more dollars flowing to the community, more housing off-campus needed, and more off-campus demand for amenities. This will benefit the local community and the campus with the expected growth and investment in surrounding infrastructure.

The University maintains close relationship with companies such as Whiting Turner, Chastain Skillman, and the City of Lakeland. These companies each play an important role in the various phases of planning, design and construction and reflect the diverse professional opportunities that are available to students studying industrial and civil engineering. Additionally, University connections with engineering firms such as Black & Veatch or Burns & McDonnell could be strengthened.

E. If other public or private institutions in Florida have similar programs that exist at the four- or six-digit CIP Code or in other CIP Codes where 60 percent of the coursework is comparable, identify the institution(s) and geographic location(s). Summarize the outcome(s) of communication with appropriate personnel (e.g., department chairs, program coordinators, deans) at those institutions regarding the potential impact on their enrollment and opportunities for possible collaboration in the areas of instruction and research.

Florida is home to the following public and private institutions with Civil Engineering baccalaureate programs. Feedback from SUS deans and representatives on the CAVP-ACG indicates that there remains no concern about any potential impact to enrollments at these institutions. The private institutions produce few graduates in the field and it is not expected that students who are in the market for the private Universities are typically not the student population that Florida Poly attracts.

Univ	Headcount, 5-yr Avg	Degrees, 5-yr Avg
FAMU	32.8	4.4
FAU	196.6	57
FGCU	300	50.4
FIU	702.2	124.8
FSU	406.2	85.2
UCF	585.4	115.4
UF	534.2	141.6
UNF	228.8	35.6
USF	496.8	106.2
SUS	3483	720.6

Private Institutions	**Conferred Degrees (2020-21)**		**Fall Enrollment (2021)**	
	Civil Eng.	Ind. Eng.	Civil Eng.	Ind. Eng.
University of Miami	13	46	41	120
Florida Institute of Technology	28	0	Unknown*	0
Polytechnic University of Puerto Rico-Orlando	0	0	0	0
* For FIT the enrollment includes all their engineering programs both with IPEDS and on their website (nothing specific to Civil).				

F. Describe the process for the recruitment and retention of a diverse student body in the proposed program. If the proposed program substantially duplicates a program at FAMU or FIU, provide a letter of support from the impacted institution(s) addressing how the program will impact the institution's ability to attract students of races different from that which is predominant on the FAMU or FIU campus. The institution's Equal Opportunity Officer shall review this Section of the proposal, sign, and date the additional signatures page to indicate that all requirements of this section have been completed.

Goal #1 of Florida Poly's strategic plan 2018 – 2023 is to enroll a high-quality incoming class. To impact this goal, the University has restructured its admission and financial aid operations to support stronger evidenced-based decision making, including market segmentation, reorganized its staffing model to improve coverage, tactics, and messaging, and changed its admissions process to include a holistic view of prospects through items such as essays and recommendation letters. Our enrollment continues to grow.

The programs at FIU and FAMU provided no indication of concern regarding any impact a Florida Poly civil engineering program might have on their enrollment or diversity characteristics. Moreover, the proposed program, while similar, as all civil programs must meet the same ABET criteria, differs in its unique elements and opportunities with respect to AMI and FIPR. No letters from either institution have been received.

IV. Curriculum

A. Describe all admission standards and all graduation requirements for the program. Hyperlinks to institutional websites may be used to supplement the information provided in this subsection; however, these links may not serve as a standalone response. For graduation requirements, please describe any additional requirements that do not appear in the program of study (e.g., milestones, academic engagement, publication requirements).

There are no special admissions requirements for this program. Admissions requirements are the same for all Florida Poly students and a minimum is set by the Florida Board of Governors. Florida Poly recruits and selects students the University believes can be successful in our programs. Particular attention may be paid to test scores, high school GPA, and type(s) of any accelerated credit earned.

In general, students must complete the 120 credit hour program with a 2.0 or better and satisfy all program requirements. Florida Poly also requires that students complete an internship or equivalent professional experience during their program. Complete Graduation Requirements for a Baccalaureate degree are found in the Academic Catalog and in FPU-5.0094AP.

The following are minimum requirements for awarding the baccalaureate degree:
1. Satisfactory completion of the applicable college or program degree requirements and established curriculum as identified in the University Catalog in effect at the beginning of the student's most recent period of continuous enrollment.
2. Satisfactory completion of a minimum of one hundred twenty (120) credit hours with a cumulative GPA of 2.0 or better in coursework attempted at the University.
3. Satisfactory completion of thirty-six (36) credit hours of general education courses in communication, mathematics, social sciences, humanities, and natural sciences including six (6) credit hours of English Composition coursework and six (6) credit hours of mathematics courses at the college algebra level or higher. For the purposes of this rule, a grade of C or higher shall be considered successful completion.
4. Satisfactory completion of an additional six (6) credit hours of courses designated as "writing intensive" (W) by the University.
5. Satisfactory completion of at least forty-eight 48 credit hours of courses numbered 3000 and above.
6. Earn at least one-fourth of the credits applied towards the Baccalaureate degree, half of the major course credits, and the last thirty (30) credits in residence at Florida Poly. In cases of emergency, a maximum of six credits of the final thirty credits may be completed by correspondence or residence at another accredited institution with the approval of the program Department Chair and University Registrar.
7. Earn at least nine (9) credit hours in one or more summer semesters, unless the student entered the University with more than sixty (60) credit hours, or the University President or his/her designee waives this requirement.
8. Completion of the foreign-language admissions requirement.
9. Satisfactory completion of any pre-requisites or deficiencies as identified by the student's Faculty Advisor
10. Submission of a completed Graduation Application to the Office of the University Registrar so that it is received by the Registrar on or before the "Graduation Application Deadline" as noted on the Academic Calendar for the semester in which the student anticipates graduating.

B. Describe the specific expected student learning outcomes associated with the proposed program and include strategies for assessing the proposed program's learning outcomes. If the proposed program is a baccalaureate degree, include a hyperlink to the published Academic Learning Compact and the document itself as Appendix C.

The program in Civil Engineering follows criteria set forth by the Engineering Accreditation Commission of ABET. The student outcomes for Civil Engineering are as follows:

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. an ability to 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.
3. an ability to communicate effectively with a range of audiences.
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Program outcomes are supported by performance indicators – language that contextualizes these broader outcomes. Performance indicators are assessed in key courses throughout and near the end of the student's curriculum. Data is collected on a regular basis and a portion of the learning outcomes are reviewed annually.

The Academic Learning Compact, included in Appendix C, will be published after the program has been included in the SUS Inventory and can be posted and advertised in compliance with regulation.

C. If the proposed program is an AS-to-BS capstone, provide evidence that it adheres to the guidelines approved by the Articulation Coordinating Committee for such programs, as outlined in State Board of Education Rule 6A-10.024. Additionally, please list the prerequisites, if any, and identify the specific AS degrees that may transfer into the proposed program.

☒ Not applicable to this program because it is not an AS-to-BS Capstone.

D. Describe the curricular framework for the proposed program, including the following information where applicable:

- **total numbers of semester credit hours for the degree**
- **number of credit hours for each course**
- **required courses, restricted electives, and unrestricted electives**
- **a sequenced course of study for all majors, concentrations, tracks, or areas of emphasis**

The proposed program in Civil Engineering requires that students earn 120 credit hours for the degree. Two views of the program are presented here.

B.S. Civil Engineering

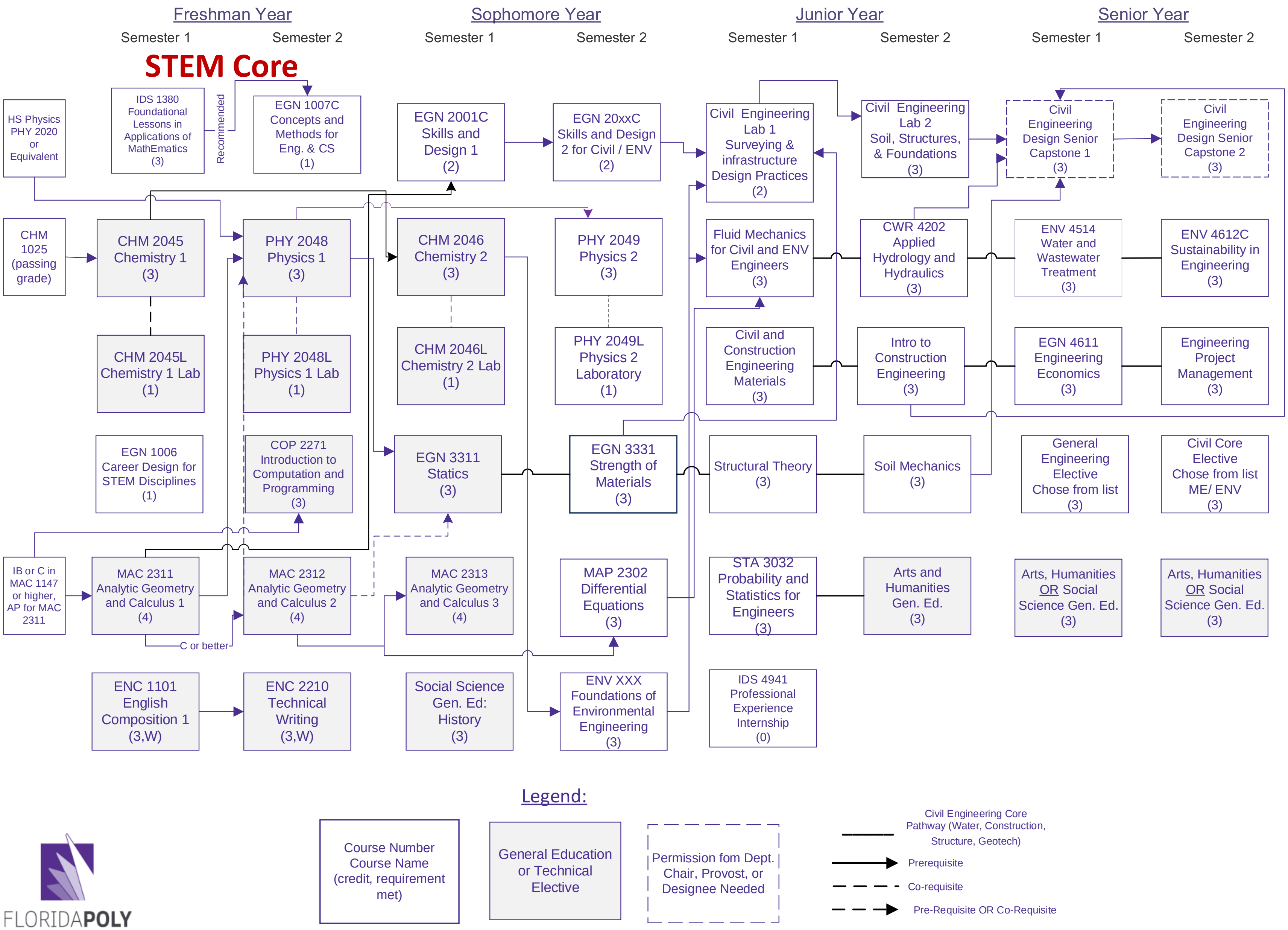
Florida Poly Program Template Approved 4/7/2017 (upd. 09.07.2022)

The following program curriculum template was approved by the UCC and the Provost in spring 2017. This template exists to ensure a certain level of consistency across new and existing programs in terms of general education, foundations, program core, and capstone requirements.

Category	Section	Course	Credits	Notes
I. Professional Foundations Core			8	
		EGN 1006 - Career Design for STEM Professionals	*1*	
		IDS 4941 - Professional Experience Internship	0	Included in Program Core
		IDS 1380 - Foundational Lessons and Applications in Mathematics	*3*	
		EGN 1007C - Concepts and Methods for Engineering and Computer Science	*1*	
II. General Education		*State Required Minimum*	**36**	
	Rules	1. Students must complete at least one ♦ course in each category to satisfy state of Florida regulation.		
	Section A	**Communication**	**6**	
		ENC 1101 - English Composition 1: Exp and Arg Writing (W) ♦	**3**	
		ENC 2210 - Technical Writing (W)	**3**	
Programs must require 12 credits of Humanities & Social Sciences. These may be broken down evenly or by 3/9; 9/3; however, students must complete at least 3 credits of state required coursework in each category.	**Section B**	**Humanities (choose from)**	**3 to 6**	
		ARH 2000 - Art Appreciation (W) ♦	3	
		PHI 2010 - Introduction to Philosophy (W) ♦	3	
		HUM 2020 - Introduction to the Humanities (W) ♦	3	
		MUL 2010 - Music Appreciation (W) ♦		
		LIT 2000 - Introduction to Literature (W) ♦		
		HUM 2022 Explorations in the Humanities (Various Topics) (W)	3	
		IDS 2144 Legal, Ethical, and Management Issues in Technology	3	
	Section C	**Social Science (choose from)**	**3 to 6**	
		AMH 2010 - American History to 1877	3	
		AMH 2020 - American History Since 1877 (W) ♦ Satisfies Florida State Civics Requirement	3	
		AMH 2930 - History: Special Topics	3	
		ECO 2013 - Principles of Macroeconomics (W) ♦	3	
		ECO 2023 - Principles of Microeconomics (W)	3	
		PSY 2012 - General Psychology (W) ♦		
	Section D	**Mathematics**	**7**	
		MAC 2311 - Analytic Geometry and Calculus 1 ♦	4	
		MAP 2302 - Differential Equations	3	
	Section E	**Natural Sciences**	**8**	
		PHY 2048 - Physics 1 ♦	3	
		PHY 2048L - Physics 1 Laboratory	1	
		CHM 2045 - Chemistry 1 ♦	3	
		CHM 2045L - Chemistry 1 Laboratory (W)	1	
	Section F	**Advanced Math and Science -- GE**	**3**	
		STA 3032 - Probability and Statistics	3	
II. Program Foundations / Advanced Math & Science			**15**	*12 to 15*
		MAC 2312 - Analytic Geometry and Calculus 2	4	
		MAC 2313 - Analytic Geometry and Calculus 3	4	
		PHY 2049 - Physics 2	3	
		PHY 2049L - Physics 2 Laboratory	1	
		COP 2271C - Introduction to Computation and Programming (required for all	3	

III. Program Core			**53**	
		40 credits represents a minimum, depending on how many credits are included in Category II, above.		
		Pre-Capstone design sequences should be included in this category--may be listed as a subset in catalog to stand out.		
Add Rows as needed		***The following should be counted in this category:***		
		** IDS 1380 - FLAME: Credits: 3*		
		** EGN 1007C - Concepts and Methods for Engineering and Computer Science: Credits: 3*		
	Design Block	EGN 1006 - Career Design for STEM Professionals	1	
		IDS 1380 - Foundational Lessons and Applications in Mathematics	3	
		EGN 1007C - Concepts and Methods for Engineering and Computer Science	1	
		EGN 2001C - Skills & Design 1	2	
		EGN 20XXC - Skills & Design for Civil and Environmental Engineering	2	
		XXX - Civil Engineering Lab 1 - Surveying & Infrastructure Design Practices	2	
		XXX - Civil Engineering Lab 2 - Soil, Structures, and Foundations	3	
		XXX - Civil Engineering Senior Design Capstone 1	see	
		XXX - Civil Engineering Senior Design Capstone 2	below	
	CE Core	EGN 3311 - Statics	3	
		EGN 3331 - Strength of Materials	3	
		ENV XXX - Foundations of Environmental Engineering	3	
		XXX - Fluid Mechanics for Civil and Environmental Engineerings	3	
		XXX - Civil and Construction Engineering Materials	3	
		XXX - Structural Theory	3	
		CWR 4202 - Applied Hydrology and Hydraulics	3	
		XXX - Intro to Construction Engineering	3	
		XXX - Soil Mechanics	3	
		ENV 4514 - Waste and Wastewater Treatment	3	
		EGN 4611 - Engineering Economics	3	
		ENV 4612C - Sustainability in Engineering	3	
		XXX - Engineering Project Management	3	
V. Electives & Other Requirements			**10**	*3 or 6*
		The number of electives may be reduced to fill out the program core or meet institutional or state required general education requirements.		
		CHM 2046 - Chemistry 2	3	
		CHM 2046L - Chemistry 2 Lab	1	
		Choose from Mechanical Engineering / Environmental Engineering lists	3	
		Civil Engineering Core Elective	3	
VI. Capstone			**6**	
		All programs are required to have a 6 credit senior capstone sequence.		
		XXX-4XXX Senior Capstone 1	3	
		XXX-4XXX Senior Capstone 2	3	
TOTAL HOURS			**120**	

A second view, a program flow chart, shows the optimal path through the degree program.


Freshman Year
Semester 1
Semester 2
Sophomore Year
Semester 1
Semester 2
Junior Year
Semester 1
Semester 2
Senior Year
Semester 1
Semester 2
STEM Core
HS Physics PHY 2020 or Equivalent
IDS 1380 Foundational Lessons in Applications of MathEmatics (3)
Recommended
EGN 1007C Concepts and Methods for Eng. & CS (1)
EGN 2001C Skills and Design 1 (2)
EGN 20xxC Skills and Design 2 for Civil / ENV (2)
Civil Engineering Lab 1 Surveying & infrastructure Design Practices (2)
Civil Engineering Lab 2 Soil, Structures, & Foundations (3)
Civil Engineering Design Senior Capstone 1 (3)
Civil Engineering Design Senior Capstone 2 (3)
CHM 1025 (passing grade)
CHM 2045 Chemistry 1 (3)
PHY 2048 Physics 1 (3)
CHM 2046 Chemistry 2 (3)
PHY 2049 Physics 2 (3)
Fluid Mechanics for Civil and ENV Engineers (3)
CWR 4202 Applied Hydrology and Hydraulics (3)
ENV 4514 Water and Wastewater Treatment (3)
ENV 4612C Sustainability in Engineering (3)
CHM 2045L Chemistry 1 Lab (1)
PHY 2048L Physics 1 Lab (1)
CHM 2046L Chemistry 2 Lab (1)
PHY 2049L Physics 2 Laboratory (1)
Civil and Construction Engineering Materials (3)
Intro to Construction Engineering (3)
EGN 4611 Engineering Economics (3)
Engineering Project Management (3)
EGN 1006 Career Design for STEM Disciplines (1)
COP 2271 Introduction to Computation and Programming (3)
EGN 3311 Statics (3)
EGN 3331 Strength of Materials (3)
Structural Theory (3)
Soil Mechanics (3)
General Engineering Elective Chose from list (3)
Civil Core Elective Chose from list ME/ ENV (3)
IB or C in MAC 1147 or higher, AP for MAC 2311
MAC 2311 Analytic Geometry and Calculus 1 (4)
MAC 2312 Analytic Geometry and Calculus 2 (4)
MAC 2313 Analytic Geometry and Calculus 3 (4)
MAP 2302 Differential Equations (3)
STA 3032 Probability and Statistics for Engineers (3)
Arts and Humanities Gen. Ed. (3)
Arts, Humanities OR Social Science Gen. Ed. (3)
Arts, Humanities OR Social Science Gen. Ed. (3)
C or better
ENC 1101 English Composition 1 (3,W)
ENC 2210 Technical Writing (3,W)
Social Science Gen. Ed: History (3)
ENV XXX Foundations of Environmental Engineering (3)
IDS 4941 Professional Experience Internship (0)
Legend:
Course Number Course Name (credit, requirement met)
General Education or Technical Elective
Permission fom Dept. Chair, Provost, or Designee Needed
Civil Engineering Core Pathway (Water, Construction, Structure, Geotech)
Prerequisite
Co-requisite
Pre-Requisite OR Co-Requisite
FLORIDAPOLY

E. Provide a brief description for each course in the proposed curriculum.

Freshman Year – STEM Core:

- **IDS 1380 - Foundational Lessons in Applications of MathEmatics**
  - Credits: 3
  - Course Description: This foundational course provides practical mathematical application to problems in engineering, computer science, and related STEM disciplines. All STEM applications will be presented within the context math topics and reinforced through extensive examples of their use in the core STEM courses. This course is designed to put the application first and then apply the mathematics to model or simulate it with hand calculations and/or computer software. Student will focus on their 'habits of mind' to consciously practice problem solving techniques, exercise best practice formats, and implement software that will provide the foundation for future success in a STEM curriculum.
  - Prerequisites: None
- **CHM 2045 - Chemistry 1**
  - Credits: 3
  - Course Description: This course introduces the principles of chemistry and their applications based upon the study of physical and chemical properties of the elements. Topics covered in this class includes: stoichiometry, atomic and molecular structure, the states of matter, chemical bonding, thermochemistry, and gas laws.
  - Prerequisites: None
  - Co-requisite or Prerequisite: Passing grade in CHM 1025
  - Co-requisite: CHM 2045L - Chemistry 1 Laboratory
- **CHM 2045L - Chemistry 1 Laboratory**
  - Credits: 1
  - Course Description: Students will participate in laboratory experiments designed to reflect the topics presented in CHM 2045 - Chemistry 1 . This course meets communication/writing-intensive requirements.
  - Prerequisites: None
  - Co-requisite: CHM 2045 - Chemistry 1
- **EGN 1006 - Career Design for STEM Disciplines**
  - Credits: 1
  - Course Description: This foundation course will provide students with an experience to engage in the academic process, training in skills for academic survival and professional success with implementation through participation in hands-on team project using basic skills from various STEM disciplines. Students will be introduced to teaming and leadership skills to gain introductory knowledge of design principles and exercise communication skills basic to academic and professional success.
  - Primary Term(s) Offered: Fall, Spring Rotation Year Annually
- **MAC 2311 - Analytic Geometry and Calculus 1**
  - Credits: 4
  - Course Description: This course is an introduction to analytic geometry; limits; continuity; differentiation of algebraic, trigonometric, exponential and logarithmic functions; applications of the derivative; inverse trigonometric functions; differentials; introduction to integration; and the fundamental theorem of calculus.
  - Prerequisites: Any of the following:

        - a grade of C in a MAC course numbered 1147 or higher
        - IB credit for a MAC course numbered 1147 or higher.
        - Any course grades, AP or IB scores used to meet this prerequisite must be on file by registration.
- **ENC 1101 - English Composition 1: Expository and Argumentative Writing**
    - Credits: 3
    - Course Description: This course focuses on the principal elements of writing clearly, efficiently and effectively. Logical arguments, building research skills and developing critical thinking through reading, writing and discussion are also presented. This course meets communication/writing-intensive requirements (W).
    - Prerequisites: None
- **EGN 1007 - Concepts and Methods for Engineering and Computer Science**
    - Credits: 1
    - Course Description: Students learn foundational skills, calculation methods, and basic programming in Excel for engineering problems. This course supports students' abilities to calculate and analyze data and provide them a foundation for applying engineering skills throughout the curriculum, in internship, and employment.
    - Prerequisites: None
- **PHY 2048 - Physics 1**
    - Credits: 3
    - Course Description: This is the first of a two-semester sequence of physics for technology and engineering. The course covers Newtonian mechanics and includes motion, vectors, Newton's laws, work and conservation of energy, systems of particles, collisions, equilibrium, oscillations, thermodynamics and waves.
    - Prerequisites: High-school Physics and (PHY 2020 or the equivalent) and MAC 2311 - Analytic Geometry and Calculus 1
    - Co-requisite or Prerequisite: MAC 2312 - Analytic Geometry and Calculus 2
    - Co-requisite: PHY 2048L - Physics 1 Laboratory
- **PHY 2048L - Physics 1 Laboratory**
    - Credits: 1
    - Course Description: This laboratory experience for PHY 2048 Physics with MAC 2311 - Analytic Geometry and Calculus 1 provides practical applications of Newtonian mechanics.
    - Prerequisites: None
    - Co-requisite: PHY 2048 - Physics 1
- **COP 2271 - Introduction to Computation and Programming**
    - Credits: 3
    - Course Description: This course is an introduction to computational thinking and the art of computer programming using the C programming language. Students will learn fundamental programming concepts and systematic design techniques. They will use them to write programs that computationally solve and reduce problems. At the end of the course, students will be able to use a programming language without focusing on the language specifics. No prior programming background is required and a working knowledge of high school level algebra is expected.
    - Prerequisites: MAC 1147 - Pre-calculus Algebra and Trigonometry or equivalent, e.g. Aleks score
- **MAC 2312 - Analytic Geometry and Calculus 2**
    - Credits: 4

- Course Description: Techniques of integration; applications of integration; differentiation and integration of inverse trigonometric, exponential, and logarithmic functions; sequences and series are presented in this class.
- Prerequisites: A grade of C or better in MAC 2311 - Analytic Geometry and Calculus 1

- **ENC 2210 - Technical Writing**
  - Credits: 3
  - Course Description: This course focuses on the forms, formats, and genres of business, government, professional, and technical communication. Students are given opportunities to practice creating proposals, reports, applications, and resumes. This course meets communication/writing-intensive requirements (W).
  - Prerequisites: ENC 1101 - English Composition 1: Expository and Argumentative Writing

Sophomore Year:

- **EGN 2001C - Skills and Design 1**
  - Credits: 2
  - Course Description: This course aims to integrate engineering design activities with engineering graphical communications using Computer Aided Design (CAD) software and professional skills emphasizing teaming and leadership, and communication in a variety of mediums. Computer Aided Design (CAD) software is used as a tool to create 2D and 3D sketches, 3D parts, 3D assemblies, and engineering drawing per industry standards. Skills in parametric modeling include planning and model strategy, dimensioning and tolerances, perspectives, and use of basic features in the CAD software. The project will allow students to integrate these basic skills with additive manufacturing processes to develop solutions to real world engineering problems. This course will develop students' knowledge of design processes as well as basic mechanical engineering skills, which will begin to prepare them for future open-ended problems in their capstone design course.
  - Prerequisites: MAC 2311 - Analytic Geometry and Calculus 1
- **CHM 2046 – Chemistry 2**
  - Credits: 3
  - Course Description: This course introduces the principles of chemistry and their applications based upon the study of physical and chemical properties of the elements. Topics covered in this class includes solutions, chemical thermodynamics, chemical kinetics, acid-based equilibrium, electrochemistry, inorganic chemistry, nucleic chemistry, organic chemistry, biochemistry, transition metals (biological and medical applications.
  - Co-requisite or Prerequisite: CHM 2045 - Chemistry 1 and CHM 2045L - Chemistry 1 Laboratory
  - Co-requisite: CHM 2046L - Chemistry 2 Laboratory
  - Course Co-Requisites: A grade of C or higher in CHM2045 and MAC1147 or equivalent
- **CHM 2046L - Chemistry 2 Laboratory**
  - Credits: 1
  - Course Description: Students will participate in laboratory experiments designed to reflect the topics presented in CHM 2046 - Chemistry 2 . This course meets communication/writing-intensive requirements (W).
  - Prerequisites: None
  - Co-requisite: CHM 2046 - Chemistry 2
- **EGN 3311 - Statics**
  - Credits: 3

- Course Description: This course covers the equilibrium of particles frames, machine, trusses and rigid bodies in two and three dimensions using vector algebra.
- Prerequisites: PHY 2048 - Physics 1
- Co-requisite or Prerequisite: MAC 2312 - Analytic Geometry and Calculus 2

- **MAC 2313 - Analytic Geometry and Calculus 3**
  - Credits: 4
  - Course Description: This course covers solid analytic geometry, vectors, partial derivatives and multiple integrals.
  - Prerequisites: Letter grade of C or higher in MAC 2312 - Analytic Geometry and Calculus 2
- **PHY 2049 - Physics 2**
  - Credits: 3
  - Course Description: The second of a two-semester sequence of physics for scientists and engineers. Content includes Coulomb's law, electric fields and potentials, capacitance, currents and circuits, Ampere's law, Faraday's law, inductance, Maxwell's equations, electromagnetic waves, ray optics, interference and diffraction.
  - Prerequisites: PHY 2048 - Physics 1 and MAC 2312 - Analytic Geometry and Calculus 2
  - Co-requisite: PHY 2049L - Physics 2 Laboratory
- **PHY 2049L - Physics 2 Laboratory**
  - Credits: 1
  - Course Description: This laboratory experience for PHY 2049 - Physics 2 with MAC 2312 - Analytic Geometry and Calculus 2 illustrates the practical applications of Coulomb's law, electric fields and potentials, capacitance, currents and circuits, Ampere's law, Faraday's law, inductance, Maxwell's equations, electromagnetic waves, ray optics, interference and diffraction.
  - Prerequisites: None
  - Co-requisite: PHY 2049 - Physics 2
- **EGN 3331 - Strength of Materials**
  - Credits: 3
  - Course Description: Topics include properties of materials; Mohr's Circle; Hooke's Law for isotopic materials; stress and strain; stress strain diagrams; design loads; safety and working stresses; shear and moment diagrams; beams of two materials; indeterminate axially-loaded members; torsional shearing stresses and loads; displacements; and flexural and transverse shear stresses.
  - Prerequisites: MAC 2312 - Analytic Geometry and Calculus 2 and EGN 3311 - Statics and PHY 2048 - Physics 1
- **MAP 2302 - Differential Equations**
  - Credits: 3
  - Course Description: The relationship between differential equations and initial conditions to physical problems in engineering, physics, technology and other applied areas is discussed. Students will be able to formulate, solve, and analyze the results of mathematical models of elementary physical problems and apply them. Topics include: first-order ordinary differential equations, theory of linear ordinary differential equations, solution of linear ordinary differential equations with constant coefficients, the Laplace transform and its application to solving linear ordinary differential equations.
  - Prerequisites: MAC 2312 - Analytic Geometry and Calculus 2 (with a minimum grade of C)

Junior Year:

- **STA 3032 - Probability and Statistics**
    - Credits: 3
    - Course Description: This course is a survey of the basic concepts in probability and statistics with applications in electrical, mechanical, and civil engineering. Topics include probability, common discrete and continuous probability distributions, estimation and hypothesis testing, and simple regression.
    - **This course is not equivalent to STA 3036 - Probability and Statistics for Business, Data Science, and Economics and will not be approved as a substitution if you change majors into DSBA.
    - Prerequisites: MAC 2312 - Analytic Geometry and Calculus 2 with a grade of C or higher
- **IDS 4941 - Professional Experience Internship**
    - Credits: 0
    - Course Description: This course is a co-curricular requirement that provides students with the opportunity to experience working in a professional environment or community-based organization where they can apply the knowledge and skills they have gained from their program.
    - This requirement may be satisfied through a traditional internship provided by an employer; a community service experience; or some other form of professional/entrepreneurial experience; pending approval by the Provost or designee. The student is assessed resident tuition and the associated fees for one credit hour (see BOG Regulation 7.0003 and University Policy FPU 4.001). A grade of satisfactory/unsatisfactory is earned and included on the transcript for the course.
    - Prerequisites: Completion of at least 72 Credit hours, or permission of Department Chair, Provost, or designee.
- **CWR 4202 - Applied Hydrology and Hydraulics**
    - Credits: 3
    - Course Description: Physical processes governing occurrence and distribution of precipitation, infiltration, evaporation, and surface water runoff. Statistical hydrology, unit hydrograph theory, and watershed modeling. Floodplain hydrology and open channel hydraulics. Urban hydrology, hydraulics and design of storm sewers, and design of detention structures for flood control.
    - Prerequisites: MAP 2302 - Differential Equations and EGN 3343 - Engineering Thermodynamics and EML 3015 - Fluid Mechanics and ENV 2003 - Introduction to Environmental Engineering

Senior Year:

- **ENV 4514 - Water and Wastewater Treatment**
    - Credits: 3
    - Course Description: Design of water and wastewater treatment units.
    - Prerequisites: ENV 3008 Environmental Chemistry and ENV 3004C Environmental Engineering Lab I; Chemistry II - Civil Engineering majors.
- **EGN 4611 - Engineering Economics**
    - Credits: 3
    - Course Description: The objective is to help engineering students recognize and understand the importance of cost factors that are inherent in all engineering decisions. Development of ability to handle engineering problems that involve economic factors. The course includes economic environment, selections in present economy, value

analysis, critical path economy, interest and money-time relationships, depreciation and valuation, capital financing and budgeting, basic methods for undertaking economic studies, risk, uncertainty and sensitivity, selections between alternatives, fixed, increment, and sunk costs, the effects of income taxes in economic studies, replacement studies, minimum cost formulas, economic studies of public projects, economic studies in public utilities. Effects of inflation are considered at each step.
    - Prerequisites: Permission from Department Chair
- **ENV 4612 - Sustainability in Engineering**
    - Credits: 3
    - Course Description: Sustainable practices are defined and green engineering principles are directed towards engineering design. Life cycle analysis are used to assess environmental, economic, and societal impacts to evaluate material choices, construction practices, water and waste treatment practices, transportation infrastructure, policy, and planning, agricultural practices, and energy generation and consumption.
    - Prerequisites: CHM 2046 Chemistry 2 and ENV 2003 - Introduction to Environmental Engineering and ENV 3008 Environmental Chemistry or other equivalent.

NEW COURSES
Civil Engineering

EGN2002C – Skills and Design 2 (active course- not new)
Credits: 2

- Course Description: This course aims to advance the knowledge and experience of students to use engineering tools and professional skills to seek solutions to real world problems. Students will engage in engineering design activities, use Computer Aided Design (CAD) software, and continue to mature with professional skills emphasizing teaming and leadership, and communication in a variety of mediums. Intermediate Computer Aided Design (CAD) skills including parts assembly, model motion and analysis, and design tables. The project will allow students to integrate these intermediate level skills with subtractive manufacturing processes. This course will enhance students' knowledge of design processes as well as build intermediate level mechanical engineering skills, which will continue to prepare them future open-ended problems in their capstone design course.
- Prerequisites: EGN 2001C - Skills and Design 1
- Co-requisite or Prerequisite: EGN 3311 - Statics

Soil Mechanics
Credits: 3

- PHYSICAL PROPERTIES OF SOILS, COMPACTION, FLOW OF WATER THROUGH SOIL, DISTRIBUTION OF STRESS WITHIN SOIL AND CONSOLIDATION.

Civil Engineering Lab 1
Credits: 2

- A LAB EXPERIENCE IN DEPARTMENTAL FACILITIES INCLUDING THE SUBJECT AREAS OF STRUCTURES, MATERIALS FLUIDS, TRANSPORTATION, SOILS, ENGINEERING MECHANICS AND ENVIRONMENTAL ENGINEERING.

Fluid Mechanics for Civil and Environmental Engineering
Credits: 3

- BASIC PRINCIPLES OF CONTINUUM FLUID MECHANICS AND TRANSPORT CONCEPTS. VISCOUS FLUID THEORY; MOMENTUM AND ENERGY CONSIDERATION. INTRODUCTION TO HYDRAULICS, PIPE FLOW.

Civil and Construction Engineering Materials
Credits: 3

- A STUDY OF THE PRINCIPAL MATERIALS USED FOR ENGINEERING PURPOSES WITH SPECIAL ATTENTION TO THEIR MECHANICAL PROPERTIES AND THE IMPORTANCE OF THESE PROPERTIES TO THE ENGINEER.

Structural Theory
Credits: 3

- ADVANCED MECHANICS OF MATERIALS APPLIED TO CIVIL STRUCTURAL SYSTEMS, ELASTICITY, TORSION, INELASTIC BENDING, FAILURE THEORY FOR CONCRETE AND SOILS, COMPATIBILITY, EQUILIBRIUM, AND ENERGY METHODS.

Civil Engineering Lab 2 (repeat of Lab 1)
Credits: 3

- A LAB EXPERIENCE IN DEPARTMENTAL FACILITIES INCLUDING THE SUBJECT AREAS OF STRUCTURES, MATERIALS FLUIDS, TRANSPORTATION, SOILS, ENGINEERING MECHANICS AND ENVIRONMENTAL ENGINEERING.

Intro to Construction Engineering
Credits: 3

- AN INTRODUCTION TO THE THEORY AND PRINCIPLES OF CONSTUCTION ENGINEERING AND ENGINEERING MANAGEMENT. EMPHASIS ON PREDESIGN, PLANNING, SCHEDULING,

CONTRACTS AND SPECIFICATIONS, CONSTRUCTION METHODS AND EQUIPMENT, AND CONSTRUCTION SAFETY.

Engineering Project Management

Credits: 3

- THIS COURSE PROVIDES AN OVERVIEW OF PROJECT ORGANIZATION, TEAM FORMATIONS, AND OPERATIONS INVOLVING MATRIX TEAMS (AS WELL AS OTHER FORMULATIONS) AND AN OVERVIEW OF THE PROJECT LIFE CYCLE. PROJECT PLANNING, SCHEDULING, AND CONTROL ARE ALSO DISCUSSED AS WELL AS ECONOMIC DECISIONS INVOLVING PROJECTS SUCH AS CAPITAL BUDGETING, RISK ANALYSIS, AND REPLACEMENT DECISIONS. STUDENTS MAKE ORAL AND WRITTEN PRESENTATIONS. PERMISSION OF THE INSTRUCTOR IS REQUIRED IN ORDER TO ENROLL IN THIS COURSE.

Foundations of Environmental Engineering

Credits: 3

- INTRODUCTION TO TOPICS IN ENVIRONMENTAL ENGINEERING, INCLUDING WATER AND AIR QUALITY, SUSTAINABLE MATERIALS MANAGEMENT, AND ECOSYSTEMS.

F. For degree programs in medicine, nursing, and/or allied health sciences, please identify the courses that contain the competencies necessary to meet the requirements identified in Section 1004.08, Florida Statutes. For teacher preparation programs, identify the courses that contain the competencies necessary to meet the requirements outlined in Section 1004.04, Florida Statutes.

☒ Not applicable to this program because the program is not a medicine, nursing, allied health sciences, or teacher preparation program.

G. Describe any potential impact on related academic programs or departments, such as an increased need for general education or common prerequisite courses or increased need for required or elective courses outside of the proposed academic program. If the proposed program is a collaborative effort between multiple academic departments, colleges, or schools within the institution, provide letters of support or MOUs from each department, college, or school in Appendix D.

The program in Civil Engineering is anticipated to help the University grow its overall enrollment. As such, there is not an expectation that this program will unnecessarily impact or burden any one department as the overall growth plan for the University assumes additional degree programs. Florida Poly curricula is, by its nature, interdisciplinary in many areas. It is routine for programs to offer courses that have a mix of students from different disciplines, particularly design-based courses and core engineering science courses.

The program in Civil Engineering will be taught out of the Environmental Engineering Dpeartment (which will become a Civil and environmental Engineering Department).

H. Identify any established or planned educational sites where the program will be offered or administered. If the proposed program will only be offered or administered at a site(s) other than the main campus, provide a rationale.

The program will be offered at greater than 50% face-to-face format on the University's main campus. Florida Poly has no plans at present to develop off-site locations for educational delivery.

I. Describe the anticipated mode of delivery for the proposed program (e.g., face-to-face, distance learning, hybrid). If the mode(s) of delivery will require specialized services or additional financial support, please describe the projected costs below and discuss how they are reflected in Appendix A – Table 3A or 3B.

The program will be offered at greater than 50% face-to-face format on the University's main campus. Therefore, no new or special resources will be necessary to support any distance-learning modality. Existing resources are sufficient to deliver the small amount that is already present in all of our curriculum (i.e. 2 credits, hybrid).

J. Provide a narrative addressing the feasibility of delivering the proposed program through collaboration with other institutions, both public and private. Cite any specific queries made of other institutions with respect to shared courses, distance/distributed learning technologies, and joint-use facilities for research or internships.

Florida Poly collaborates with UCF and USF on research and for faculty opportunities. With UCF, we have developed a future-faculty program that brings doctoral students near the end of their program onto our campus to teach courses and get a flavor of the actual academic career.

On the research front, many of our faculty work with and in labs at both UCF and USF and with colleagues at those institutions. The program in Civil Engineering will similarly benefit from existing relationships and, undoubtedly, will encourage further collaboration between institutions.

At this point, any queries would be theoretical. As we onboard new faculty, more conversations about potential collaborations are anticipated.

K. Describe any currently available sites for internship and/or practicum experiences. Describe any plans to seek additional sites in Years 1 through 5.

☐ Not applicable to this program because the program does not require internships or practicums.

As civil engineers design, build and supervise infrastructure projects and systems, we will be able to utilize many of our current corporate and government connections for internship sites. Specific examples include:

Industry	Company
Engineering	Black & Veatch
Engineering	Burns & McDonnell
Engineering	Chastain-Skillman
Engineering	Jacobs Engineering Services
Government	City of Lakeland

The University's Career Services Center has developed the following "Career Growth Plan" for all new programs the University implements:

- Year 1: Announce with our local audience the availability of civil engineering at Florida Poly.
- Year 2: Utilize Curriculum Advisory Boards to strategize on outreach for civil engineering career opportunities.
- Year 3: Ensure civil engineering is represented at campus career events.
- Year 4: Review and assess additional steps necessary to connect students with professional opportunities in the civil engineering field.

V. Program Quality Indicators - Reviews and Accreditation

A. List all accreditation agencies and learned societies that would be concerned with the proposed program. If the institution intends to seek specialized accreditation for the proposed program, as described in Board of Governors Regulation 3.006, provide a timeline for seeking specialized accreditation. If specialized accreditation will not be sought, please provide an explanation.

- ABET – Engineering Accreditation Commission
- American Society of Civil Engineers (ASCE)

Civil Engineering must be ABET accredited to provide value to students; therefore, at the earliest possible date (last semester of the first program graduate), the University will submit a request for evaluation and begin the process with the Engineering Accreditation Commission of ABET. Assuming a fall 2023 implmentation, the process could begin as early as spring 2027.

B. Identify all internal or external academic program reviews and/or accreditation visits for any degree programs related to the proposed program at the institution, including but not limited to programs within academic unit(s) associated with the proposed degree program. List all recommendations emanating from the reviews and summarize the institution's progress in implementing those recommendations.

Florida Polytechnic University programs in Mechanical Engineering, Computer Engineering, Electrical Engineering, and Computer Science all hold ABET accreditation. All programs were approved for a 6-year period, with Mechanical having submitted a 3-year report, which was accepted with no additional report required.

C. For all degree programs, discuss how employer-driven or industry-driven competencies were identified and incorporated into the curriculum. Additionally, indicate whether an industry or employer advisory council exists to provide input for curriculum development, student assessment, and academic-force alignment. If an advisory council is not already in place, describe any plans to develop one or other plans to ensure academic-workforce alignment.

Learning Outcomes for the program in Civil Engineering come directly from ABET criterion 3. These outcomes are developed by collection of societies of professional engineers and academics who make up the organization called ABET; thus, the learning outcomes are industry/employer-driven.

Similarly, ABET requires that its programs include “Educational Objectives” (PEOs) that are broad statements that speak to what graduates should accomplish within a few years of earning their degree. These objectives are periodically reviewed by the program's Curriculum Advisory Board (CAB), made up of industry partner representatives and academics from other institutions. When starting a new program, Florida Poly draws on the PEOs of its other programs as a starting point for the CAB's review. The PEOs for Civil Engineering are as follows:

- Graduates demonstrate growth in professional development through graduate study or professional training.
- Graduates demonstrate effective team work as members and leaders in professional environments.
- Graduates demonstrate employability in industry, government, and entrepreneurial endeavors.

Florida Polytechnic University's mission is to "serve students and industry through excellence in education, discovery, and application of engineering and applied sciences." The program in Civil Engineering directly supports these goals through program content in engineering designed to educate students to be successful professionals that serve a range of public, private, and government industries and enhance the research reputation and economy of the state of Florida in keeping with the University System's strategic plan.

VI. Faculty Participation

A. Use Appendix A – Table 2 to identify existing and anticipated full-time faculty who will participate in the proposed program through Year 5, excluding visiting or adjunct faculty. Include the following information for each faculty member or position in Appendix A – Table 2:

- **the faculty code associated with the source of funding for the position**
- **faculty member's name**
- **highest degree held**
- **academic discipline or specialization**
- **anticipated participation start date in the proposed program**
- **contract status (e.g., tenure, tenure-earning, or multi-year annual [MYA])**
- **contract length in months**
- **percent of annual effort that will support the proposed program (e.g., instruction, advising, supervising)**

This information should be summarized below in narrative form. Additionally, please provide the curriculum vitae (CV) for each identified faculty member in Appendix E.

As Appendix A illustrates, the University has six full-time, multi-year contract faculty who provide direct and supportive instruction and research associated with the program. Additionally, the University is posting advertisements for Civil Engineering faculy in spring 2023; however, we are off-cycle. In fall 2023, we will begin faculty recruitment for the program for the upcoming years. By Year 5, we anticipate at least four full-time Civil Engineering credentialed faculty to be on staff to provide primary delivery and quality assurance of the program.

B. Provide specific evidence demonstrating that the academic unit(s) associated with the proposed program have been productive in teaching, research, and service. Such evidence may include trends over time for average course load, FTE productivity, student HC in major or service courses, degrees granted, external funding attracted, and other qualitative indicators of excellence (e.g., thesis, dissertation, or research supervision).

The following workload summary describes the relative proportion of each faculty members's workload. CVs illustrate their productivity in the areas of research, in particular.

Appendix D. Faculty Workload Summary

Facuty Workload Summary for Civil Engineering

Academic Year 2022 - 2023

Facuty Member	PT or FT	Classes Taught (Course No./Credit Hrs.)	Teaching	Research or Scholarship	Service/ Other	Acad. Admin.	% Time Devoted to the Program
Fall 2022							
Mechanical Engineering							
Mary Vollaro	FT	IDS 1380 Fundamental Lessons in Applications of Mathematics	33%		13%	54%	100%
Elizabeth Kames	FT	EGN 1006 Career Design for STEM Discipline EGN 2001C Skill and Design 1 EGL 4500 Design & Analysis of Machine Components	78.60%	14.30%	7.10%		100%
Environmental Engineering							
Xiaofan Xu	FT	ENV 3008 Environmental Chemist ENG 3048 GIS Applications in Environmental Engineering	50%	37.50%	12.50%		100%
Malak Anshassi	FT	ENV 4341 Solid & Hazardous Waste Management IDS 1380 Fundamental Lessons in Applications of Mathematics	50%	41.67%	8.33%		100%
Derek Hinderson	FT	CWR 4402 Applied Hydrology & Hydraulics EGN 1006 Career Design for STEM Discipline ENV 3004C Envionmental Engineering Lab 1 EVR 1001L Environmental Science Lab	64.20%	25.00%	10.80%		100%

VII. Budget

A. Use Appendix A – Table 3A or 3B to provide projected costs and associated funding sources for Year 1 and Year 5 of program operation. In narrative form, describe all projected costs and funding sources for the proposed program(s). Data for Year 1 and Year 5 should reflect snapshots in time rather than cumulative costs.

For Fiscal Year 2023, the University received an increase to its base budget of approximately $5.1 million, which goes almost entirely to supporting program growth, including new faculty. The initial cost of the Civil Engineering program is well below this threshold, even as projected in year five.

Additionally, in 2018 the University received a recurring appropriation of $4.8 million that we have applied to the development and implementation of new programs. Of this appropriation, around $1.4 million has yet to be directly allocated to a degree program. The total operating revenue for new programs and faculty sits at around $6.5 million.

B. Use Appendix A – Table 4 to show how existing Education & General (E&G) funds will be reallocated to support the proposed program in Year 1. Describe each funding source identified in Appendix A – Table 4, and provide a justification below for the reallocation of resources. Describe the impact the reallocation of financial resources will have on existing programs, including any possible financial impact of a shift in faculty effort, reallocation of instructional resources, greater use of adjunct faculty and teaching assistants, and explain what steps will be taken to mitigate such impacts.

As noted in the previous section (VII.A.), due to recurring appropriations to the University, allocations will not impact or create any shifts in the resource support for existing programs.

C. If the institution intends to operate the program through continuing education, seek approval for market tuition rate, or establish a differentiated graduate-level tuition, as described in Board of Governors Regulation 8.002, provide a rationale and a timeline for seeking Board of Governors' approval.

☒ Not applicable to this program because the program will not operate through continuing education, seek approval for market tuition rate, or establish a differentiated graduate-level tuition.

D. Provide the expected resident and non-resident tuition rate for the proposed program for both resident and non-resident students. The tuition rates should be reported on a per credit hour basis, unless the institution has received approval for a different tuition structure. If the proposed program will operate as a continuing education program per Board of Governors Regulation 8.002, please describe how the tuition amount was calculated and how it is reflected in Appendix A – Table 3B*.*

Tuition for this program remains the same as it does for all Florida Poly programs. Our posted tuition and fees as of January 26, 2023 is as follows:

Undergraduate

UNDERGRADUATE	RESIDENT	NON-RESIDENT
Tuition	$105.07	$105.07
Out-Of-State Fee	-	$510.00
Financial Aid Fee	$5.25	$5.25
Non-Resident Financial Aid Fee	-	$25.50
Capital Improvement Trust Fund Fee	$4.76	$4.76
Transportation Fee	$3.00	$3.00
Activity and Service Fee	$17.62	$17.62
Athletic Fee	$14.12	$14.12
Health Fee	$9.58	$9.58
Technology Fee	$5.25	$5.25

E. Describe external resources, both financial and in-kind support, that are available to support the proposed program, and explain how this amount is reflected in Appendix A – Table 3A or 3B.

All Florida Poly programs have the same access to Florida Poly Foundation funds. These funds provide mostly student scholarships although can be used for other purposes such as faculty development, research, or programming associated with the degree program or field.

Appendix A, Tables 3A/3B reflect this in the absence.

VIII. Non-Faculty Resources

A. Describe library resources currently available to implement and/or sustain the proposed program through Year 5 below, including but not limited to the following:

- **the total number of volumes and serials available in the discipline and related disciplines**
- **all major journals that are available to the university's students**

The Library Director must sign the additional signatures page to indicate that they have review Sections VIII.A. and VIII.B.

The Florida Polytechnic University Library is comprised of two distinct collections: the main library collection is a multi-disciplinary digital library, and the Florida Industrial Phosphate Research (FIPR) Institute collection is primarily a comprehensive collection of phosphate-related resources and archival materials. There was a conscious effort at the inception of the institution to establish the main library as an entirely digital library. The Florida Polytechnic University Library provides specialized, STEM-focused resources and learning opportunities for students, faculty, and staff to work successfully with, interpret, and utilize information. Students at Florida Polytechnic University have 24/7/365 access to library resources via the internet.

The Florida Polytechnic University's main library is located on the second floor of the University's Innovation, Science and Technology Building, in an open-space area called the Commons. The main, digital collection contains over 150,000 full text eBook volumes that are a mixture of owned and licensed materials. There is no physical stack area.

The University Library provides support for all the degrees offered at the institution, and currently supports Masters and Bachelors programs in Computer, Electrical and Mechanical Engineering. Resources that directly support Florida Poly’s current engineering programs will also directly support the proposed Civil Engineering program. Current library resources include: AccessEngineering, American Society of Mechanical Engineers (ASME) Digital Collection, Engineering Village (Inspec and Compendex), Elsevier’s Science Direct, EBSCO Engineering Core eBook collection and associated databases, IEEE Electronic Library, and ProQuest’s SciTech Premium Collection, and SpingerLINK.

Major journals currently available through the Florida Poly Library that will directly support Civil Engineering are:

- IEEE Transaction on Intelligent Transportation System (2000 – Present)
- IEEE Transactions on Control Systems Technology (2005 – Present)
- IEEE Transactions on Instrumentation and Measurement (2003 – Present)

B. Discuss any additional library resources that are needed to implement and/or sustain the program through Year 5. Describe how those costs are reflected in Appendix A – Table 3A or 3B.

☐ Not applicable to this program because no additional library resources are needed to implement or sustain the proposed program.

To further support the Civil Engineering program, the library will seek to acquire institutional access to the American Society of Civil Engineering (ASCE) Library. ASCE Library is comprised of ASCE journals, eBooks, proceedings, and standards all of which would support the research needs of the civil engineering department. The cost of institutional access based on our FTE would be $25,904 annually.

C. Describe any specialized equipment and space currently available to implement and/or sustain the proposed program through Year 5.

Civil Engineering does need some laboratory space that is appropriate for subjects such as soils laboratory, concrete materials and testing, and possibly structures. The Gary Wendt Engineering building has included in its footprint (which is generically configured to add space to accompany our student body growth with degree program growth), includes four ground floor laboratories that are appropriate to the "dirty" use for civil engineering labs, and that can be assigned to civil engineering teaching and research needs. This building is in the Design/Build phase of its construction and is expected to be fully operational in January of 2025, or sooner. Other specialized equipment to support the civil engineering program will be put in place as we grow the program with operational funds.

D. Describe any additional specialized equipment or space that will be needed to implement and/or sustain the proposed program through Year 5. Include any projected Instruction and Research (I&R) costs of additional space in Appendix A – Table 3A or 3B. Costs for new construction should be provided in response to Section X.E. below.

☒ Not applicable to this program because no new I&R costs are needed to implement or sustain the program through Year 5.

E. If a new capital expenditure for instructional or research space is required, indicate where this item appears on the university's fixed capital outlay priority list. Appendix A – Table 3A or 3B includes only I&R costs. If non-I&R costs, such as indirect costs affecting libraries and student services, are expected to increase as a result of the program, describe and estimate those expenses in narrative form below. It is expected that high enrollment programs, in particular, would necessitate increased costs in non-I&R activities.

☒ Not applicable to this program because no new capital expenditures are needed to implement or sustain the program through Year 5.

F. Describe any additional special categories of resources needed to operate the proposed program through Year 5, such as access to proprietary research facilities, specialized services, or extended travel, and explain how those projected costs of special resources are reflected in Appendix A – Table 3A or 3B.

☒ Not applicable to this program because no additional special categories of resources are needed to implement or sustain the program through Year 5.

G. Describe fellowships, scholarships, and graduate assistantships to be allocated to the proposed program through Year 5, and explain how those are reflected in Appendix A – Table 3A or 3B.

☒ Not applicable to this program because no fellowships, scholarships and/or graduate assistantships will be allocated to the proposed program through Year 5.

IX. Required Appendices

The appendices listed in tables 1 & 2 below are required for all proposed degree programs except where specifically noted. Institutions should check the appropriate box to indicate if a particular appendix is included to ensure all program-specific requirements are met. Institutions may provide additional appendices to supplement the information provided in the proposal and list them in Table 4 below.

Table 1. Required Appendices by Degree Level

Appendix	Appendix Title	Supplemental Instructions	Included? Yes/No	Required for Degree Program Level		
				Bachelors	Masters/ Specialist	Doctoral/ Professional
A	Tables 1-4		Yes	X	X	X
B	Consultant's Report and Institutional Response					X
C	Academic Learning Compacts	Include a copy of the approved or proposed Academic Learning Compacts for the program	Yes	X		
D	Letters of Support or MOU from Other Academic Units	Required only for programs offered in collaboration with multiple academic units within the institution	No Applicable to this Proposal	X	X	X
E	Faculty Curriculum Vitae		Yes	X	X	X
F	Common Prerequisite Request Form	This form should also be emailed directly to the BOG Director of Articulation prior to submitting the program proposal to the Board office for review.	Yes	X		
G	Request for Exemption to the 120 Credit Hour Requirement	Required only for baccalaureate degree programs seeking approval to exceed the 120 credit hour requirement	Not Applicable to this Proposal	X		
H	Request for Limited Access Status	Required only for baccalaureate degree programs seeking approval for limited access status	Not Applicable to this Proposal	X		

Table 2. Additional Appendices

Appendix	Appendix Title	Description

Appendix A. Tables

APPENDIX A

TABLE 1-A
PROJECTED HEADCOUNT FROM POTENTIAL SOURCES
(Civil Engineering Baccalaureate Degree Program)

Source of Students (Non-duplicated headcount in any given year)*	Year 1 HC	Year 1 FTE	Year 2 HC	Year 2 FTE	Year 3 HC	Year 3 FTE	Year 4 HC	Year 4 FTE	Year 5 HC	Year 5 FTE
Upper-level students who are transferring from other majors within the university**	8	7	6	5	4	4	4	3	3	2
Students who initially entered the university as FTIC students and who are progressing from the lower to the upper level***	13	11	32	31	66	63	78	75	102	95
Florida College System transfers to the upper level***	2	2	3	3	10	0	15	0	18	15
Transfers to the upper level from other Florida colleges and universities***	0	0	4	4	12	0	19	0	24	20
Transfers from out of state colleges and universities***	0	0	1	1	2	1	3	2	3	2
Other (Explain)***	0	0	0	0	0	0	0	0	0	0
Totals	**23**	**20**	**46**	**44**	**94**	**68**	**119**	**80**	**150**	**134**

*   List projected annual headcount of students enrolled in the degree program. List projected yearly cumulative ENROLLMENTS instead of admissions.
** If numbers appear in this category, they should go DOWN in later years.
*** Do not include individuals counted in any PRIOR CATEGORY in a given COLUMN.

APPENDIX A
Table 2
Anticipated Faculty Participation

Faculty Code	Faculty Name or "New Hire" Highest Degree Held Academic Discipline or Specialty	Rank	Contract Status	Initial Date for Participation in Program	Mos. Contract Year 1	FTE Year 1	% Effort for Prg. Year 1	PY Year 1	Mos. Contract Year 5	FTE Year 5	% Effort for Prg. Year 5	PY Year 5
A	Mary Vollaro, Ph.D. Mechanical Engineering	Prof.	MYA	Fall 2023	9	0.75	0.22	0.17	9	0.75	0.22	0.17
A	Xiaofan Xu, Ph.D. Environmental Science	Asst. Prof.	MYA	Fall 2023	9	0.75	0.22	0.17	9	0.75	0.44	0.33
A	Malak Anshassi, Ph.D. Env/Env. Health Eng.	Asst. Prof.	MYA	Fall 2023	9	0.75	0.22	0.17	9	0.75	0.44	0.33
A	Derek Henderson, Ph.D. Civil Engineering	Asst. Prof.	MYA	Fall 2023	9	0.75	1.00	0.75	9	0.75	1.00	0.75
A	Jun Kim, Ph.D. Env/Env. Health Eng.	Asst. Prof.	MYA	Fall 2023	9	0.75	0.22	0.17	9	0.75	0.44	0.33
A	Elisabeth Kames, Ph.D. Mechanical Engineering	Asst. Prof.	MYA	Fall 2023	9	0.75	0.22	0.17	9	0.75	0.22	0.17
B	New Hire, Ph.D. Civil Engineering	Assoc. Prof.	MYA	Fall 2023	9	0.75	1.00	0.75	9	0.75	1.00	0.75
B	New Hire, Ph.D. Civil Engineering	Assoc. Prof.	MYA	Fall 2023	9	0.75	1.00	0.75	9	0.75	1.00	0.75
B	New Hire, Ph.D. Civil Engineering	Asst. Prof.	MYA	Fall 2027	0	0.00	1.00	0.00	9	0.75	1.00	0.75
B	New Hire, Ph.D. Civil Engineering	Prof.	MYA	Fall 2027	0	0.00	1.00	0.00	9	0.75	1.00	0.75
	Total Person-Years (PY)							**3.08**				**5.07**

Faculty Code	Code Description	Source of Funding	PY Workload by Budget Classification Year 1	PY Workload by Budget Classification Year 5
A	Existing faculty on a regular line	Current Education & General Revenue	1.58	2.07
B	New faculty to be hired on a vacant line	Current Education & General Revenue	1.50	3.00
C	New faculty to be hired on a new line	New Education & General Revenue	0.00	0.00
D	Existing faculty hired on contracts/grants	Contracts/Grants	0.00	0.00
E	New faculty to be hired on contracts/grants	Contracts/Grants	0.00	0.00
F	Existing faculty on endowed lines	Philanthropy & Endowments	0.00	0.00
G	New faculty on endowed lines	Philanthropy & Endowments	0.00	0.00
H	Existing or new faculty teaching outside of	Enterprise Auxiliary Funds	0.00	0.00
		Overall Totals for	**3.08**	**5.07**

APPENDIX A
TABLE 3A
EROLLMENT AND GROWTH
PROJECTED COSTS AND FUNDING SOURCES

Institutions should not edit the categories or budget lines in the table below. This table is specific to state-funded (E&G) programs, and institutions are expected to explain all costs and funding sources in Section VII.A. of the proposal. Detailed definitions for each funding category are located at the bottom of the table.

Budget Line Item	Reallocated Base* (E&G) Year 1	Enrollment Growth (E&G) Year 1	New Recurring (E&G) Year 1	New Non-Recurring (E&G) Year 1	Contracts & Grants (C&G) Year 1	Philanthropy/ Endowments Year 1	Other Funding Year 1 - Please Explain in Section VII.A. of the Proposal	Subtotal Year 1	Continuing Base** (E&G) Year 5	New Enrollment Growth (E&G) Year 5	Other*** (E&G) Year 5	Contracts & Grants (C&G) Year 5	Philanthropy/ Endowments Year 5	Other Funding Year 5 - Please Explain in Section VII.A. of the Proposal	Subtotal Year 5
Salaries and Benefits (Faculty)	0	0	390,631		0	0	0	$390,631	671,229	0	0	0	0	0	$671,229
Salaries and Benefits (A&P and USPS)	0	0	114,096		0	0	0	$114,096	120,942	0	0	0	0	0	$120,942
OPS (including assistantships & fellowships)	0	0	10,200		0	0	0	$10,200	13,600	0	0	0	0	0	$13,600
Programmatic Expenses****	0	0	378,071		0	0	0	$378,071	544,213	0	0	0	0	0	$544,213
Total Costs	**$0**	**$0**	**$892,998**	**$0**	**$0**	**$0**	**$0**	**$892,998**	**$1,349,984**	**$0**	**$0**	**$0**	**$0**	**$0**	**$1,349,984**

*Identify reallocation sources in Table 4.
**Includes recurring E&G funded costs ("reallocated base," "enrollment growth," and "new recurring") from Years 1-4 that continue into Year 5.
***Identify if non-recurring.
****include library costs, expenses, OCO, special categories, etc.

Faculty and Staff Summary

Total Positions	Year 1	Year 5
Faculty (person-years)	3.08	5.08
FTE (A&P and USPS)	2.85	3.1

Calculated Cost per Student FTE

	Year 1	Year 5
Total E&G Funding	$892,998	$1,349,984
Annual Student FTE	20	134
E&G Cost per FTE	$ 44,649.90	$ 10,074.51

Table 3 Column Explanations		
Reallocated Base* (E&G)	1	E&G funds that are already available in the university's budget and will be reallocated to support the new program. Please include these funds in the Table 4 – Anticipated reallocation of E&G funds and indicate their source.
Enrollment Growth (E&G)	2	Additional E&G funds allocated from the "Student and Other fees Tust Fund" contingent on enrollment increases.
New Recurring (E&G)	3	Recurring funds appropriated by the Legislature to support implementation of the program.
New Non-Recurring (E&G)	4	Non-recurring funds appropriated by the Legislature to support implementation of the program. Please provide an explanation of the source of these funds in the budget section (section VII.A.) of the proposal. These funds can include initial investments, such as infrastructure.
Contracts & Grants (C&G)	5	Contracts and grants funding available for the program.
Philanthropy Endowments	6	Funds provided through the foundation or other Direct Support Organizations (DSO) to support the program.
Continuing Base** (E&G)	7	Includes the sum of columns 1, 2, and 3 over time.
New Enrollment Growth (E&G)	8	See explanation provided for column 2.
Other*** (E&G)	9	These are specific funds provided by the Legislature to support implementation of the program.
Contracts & Grants (C&G)	10	See explanation provided for column 5.
Philanthropy Endowments	11	See explanation provided for column 6.
Other Funding	12	Any funding sources not already covered in any other column of the table. Please provide an explanation for any funds listed in these columns in the narrative for Section VII.A. of the proposal.

APPENDIX A

TABLE 4

ANTICIPATED REALLOCATION OF EDUCATION GENERAL FUNDS*

Program and/or E&G account from which current funds will be reallocated during Year 1	Base before reallocation	Amount to be reallocated	Base after reallocation
Example: 555-555 World exploration fund (example)	0	0	**$0**
	0	0	**$0**
	0	0	**$0**
	0	0	**$0**
	0	0	**$0**
	0	0	**$0**
	0	0	**$0**
	0	0	**$0**
Totals	$0	$0	**$0**

*** If not reallocating E&G funds, please submit a zeroed Table 4**

Program funds come from unallocated E&G.

Appendix B. Academic Learning Compact for Civil Engineering

Florida Polytechnic University's Academic Learning Compact describes what students, who follow the major's study plan, will know and be able to do. These are listed as core student learning outcomes.

Program:	Civil Engineering
Purpose of the Program:	The Civil Engineering Bachelor of Science degree program at Florida Polytechnic University is designed to provide students core competencies in a range of civil engineering applications and facilitate student success through a comprehensive, liberal education foundation that complements students' in-depth study of technical fields and principles and application of design. Civil Engineers from Florida Poly will graduate with the knowledge and skill to enter industry successfully or continue their education at the graduate level.
Graduates of the program will demonstrate the following:	1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics. 2. an ability to 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. 3. an ability to communicate effectively with a range of audiences. 4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts. 5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives. 6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions. 7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Core Learning Outcomes:

Student Learning Outcomes	**The Outcomes Involve These Skills:**		
Upon completion of the Civil Engineering Degree, students will possess:	**Content**	**Critical Thinking**	**Communication**
1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics		X	
2. an ability to 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	X		
3. an ability to communicate effectively with a range of audiences			X
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts		X	
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives	X		X
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions		X	
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.	X	X	

Appendix C. Faculty Curriculum Vitae

Faculty Vitae will be added before submission to the Board of Governors office.

Malak Anshassi- Curriculum Vitae

manshassi95@gmail.com 8203 Collier Pl, Tampa, Fl 33637 Cell: 813.385.6392

EDUCATION

University of Florida, College of Engineering, Gainesville, FL — Graduation Date

Doctor of Philosophy in Environmental Engineering Sciences, 3.95/4.00 — **December 2020**

Dissertation: *Evaluating the Use of Sustainable Materials Management in Rethinking Solid Waste Management and Policies*

Study 1: Reviewing the Underlying Assumptions in Waste LCA Models to Identify Impacts on Waste Management Decision Making

Study 2: Approaches to Integrate Sustainable Materials Management into Waste Management Planning and Policy

Study 3: The Greenhouse Gas and Economic Costs of Eliminating Residential Recycling

Study 4: Investment in Low Income Countries to Reduce Ocean Plastic and Greenhouse Gases

Master of Engineering in Environmental Engineering Sciences, 3.95/4.00 — **May 2018**

Thesis: *Incorporating Life Cycle Thinking into Solid Waste Public Policy Planning*

Study 1: Replacing Recycling Rates with Life Cycle Metrics as Government Materials Management Targets

Study 2: An Evaluation of the Methodology Used to Generate Life Cycle Based Alternative Recycling Metrics

Bachelor of Science in Environmental Engineering Sciences with minor in Sustainability Studies, 3.78/4.00 — **May 2017**

Magna Cum Laude Honors Thesis: *Setting Municipal Recycling Metrics Using Sustainable Materials Management Principles: Reaching Florida's 75% Recycling Goal*

Selected Coursework: Municipal Refuse Disposal • Solid Waste Containment Design • Groundwater and Surface Hydrology • Hydraulic Systems Design • Life Cycle Assessment • Water and Wastewater Treatment Design • Air Pollution Control Design Water Chemistry • Environmental Analysis • Ecological Engineering • Ecological Systems Design • Construction and Demotion Debris • Developing Country Solid Waste • Facets of Sustainability • Environmental Education • Green Engineering Design

Specialized Skills: WARM LCA Model • MSW-DST LCA Model • SWOLF LCA Model • EASETECH LCA Model • WRATE LCA Model • OpenLCA • Microsoft Suites • Arabic (fluent)

CERTIFICATIONS AND LICENSES

Engineering Intern (Florida, US): License #1100023360

RESEARCH/ WORK EXPERIENCE

Florida Polytechnic University

Assistant Professor of Environmental Engineering, Lakeland, FL — **August 2021-Current**

University of Florida Sustainable Materials Management Laboratory

Postdoctoral Research Associate, Gainesville, FL — **January 2021-August 2021**

Graduate Research Assistant, Gainesville, FL — **May 2017-Decemeber 2020**

Undergraduate Research Assistant, Gainesville, FL — **August 2016-May 2017**

- Took a lead role in project proposal and scope funding/grant writing and secured over 20 projects from local Florida government, Florida state agencies, and private waste industry. For a list of the projects see below.
- Managed and mentored over 20 undergraduate students and 10 graduate students in their projects with local governments in Florida and other private/public organizations looking to implement sustainable materials management.
- Mentored four Master of Engineering graduate students in their thesis research study development, experimentation, analysis, and writing execution.
- Facilitated numerous project's success related to construction and demolition debris recycling, solid waste recycling, alternatives impact studies, waste life cycle assessment, waste composition studies, and tools for local government sustainable materials management integration.
- Regularly engaged with local government decision makers, state policy makers, LCA practitioners, regulators, and private waste industry experts.
- Participated in transforming research projects into publishable peer-reviewed manuscripts and tools for sustainable materials management-based decision making. For a list see below.

RESEARCH PROJECT HISTORY

All project below conducted at University of Florida with Dr. Timothy Townsend as the Principal Investigator and I, as the Lead Researcher and Project Manager, where I directed a group of undergraduate and graduate students in completing the projects.

Estimating the Environmental Benefits of Recycling Concrete Washout, Diligent Services, Inc. **February 2021- June 2021**

- Conducting on-site visits at the facilities to estimate the mass of concrete washout produced and recycled, collecting literature/reports on concrete LCAs, and provide an evaluation of the best management practice for concrete washout.

State of Practice Review to Assess the Cost and Market Potential for Yard Trash Waste Management Practices in Miami Dade County, Miami Dade Department of Solid Waste Management **2020-2021**

- Assisted Miami Dade County by conducting research on the current mass and flows of yard trash disposed of in the county, performing a market analysis for potential yard trash end uses, and estimating the costs of instituting a yard trash compositing or mulching facility.

An Integrated Tool for Local Government to Track Materials Management and Progress toward Sustainability Goals, Hinkley Center for Solid and Hazardous Waste Management **October 2019- May 2021**

- Developed a comprehensive tool that includes: 1) the WasteCalc functions and refined functions; 2) metrics to measure environmental, social, and economic impacts developed; and 3) a method to measure Florida source reduction activities.

Examination of SMM in Alachua County to Measure Mass and Environmental Footprints of the Entire Materials Stream, Alachua County Department of Solid Waste Management **2020-2021**

- Provided Alachua County an examination of the mass and environmental footprint of their entire materials stream, evaluated alternative material source reduction strategies, and conducted a two-season waste composition study.

Determining the Mass of Food Waste Donated and Potentially Recoverable and Developing a Tool to Track Donated Food, Florida Department of Environmental Protection **January 2020- May 2020**

- Compiled information from available Florida sources that track the current masses of food waste donated, estimated the potentially recoverable masses of donated food, and developed a tool for better tracking, and conducted a LCA to measure the environmental footprints associated with the current and potential recoverable masses.

Examining Contamination Rates at Florida Materials Recovery Facilities, Florida Recycling Partnership Foundation **October 2019- April 2020**

- Gathered information from MRFs on the types and masses of waste incoming into and output from the facility and measured the historic and current recovery and contamination rates.

Conducting Waste Composition Studies and Updating the Waste Composition (WasteCalc) Model, Florida Department of Environmental Protection **2019-2020**

- Updated the WasteCalc to include current waste state and national statistics and SMM components (i.e., equations to estimate environmental footprints) and conducted waste composition studies throughout Florida (for the model).

Comparative Evaluation of Life Cycle Assessment Models' Measurement of Greenhouse Gas Emissions from Landfills and Waste-to-Energy Facilities, Local Government Coalition for Renewable Energy **2019-2020**

- Assessed the functionality of LCA models (i.e., WARM and MSW-DST) to quantify greenhouse gas emissions associated with landfills/landfill-gas-to-energy facilities and waste-to-energy facilities.

Construction and Demolition Debris (C&D) Recycling Roadmap, Construction and Demolition Recycling Association **August 2019- December 2019**

- Identified, through a series of discussions with a stakeholder working group, missing C&D recycling opportunities, developed tangible steps for local government and industry to integrate C&D recycling, and compiled findings into a comprehensive whitepaper that served as a roadmap for recycling C&D.

Updating the Waste Composition (WasteCalc) Model, Florida Department of Environmental Protection **2018-2019**

- Updated the WasteCalc model (a tool regularly used by Florida Counties to estimate their waste stream collected compositions which is then used in annual solid waste state reporting) to include current waste composition state and national statistics and developed more accurate equations for the model.

Looking Beyond Florida's 75% Recycling Goal: Development of a Methodology and Tool for Assessing Sustainable Materials Management Recycling Rates in Florida, Hinkley Center for Solid and Hazardous Waste Management

October 2018- March 2020

- Created a tool for Florida decision-makers that incorporates data from various waste LCA models to measure their waste management-based environmental and social footprints.

SMM State Waste Management Assessment for California, Minnesota, and Maryland, American Institute for Packaging and the Environment Protection **2017-2018**

- Analyzed SMM approaches implementation in three US states, to do so, data was collected on waste disposition via discussion with state representatives, and state-specific SMM approaches were formulated and applied hypothetically.

Application of Sustainable Materials Management in Polk County, Polk County Department of Solid Waste Management

2017-2018

- Examined the 2016 solid waste management practices and alternative solid waste management approaches in Polk County, Florida. The examination consisted of mapping the waste flows in the county, using LCA models to quantify the environmental impacts, and developing a method to estimate the economic costs for the 2016 waste management and alternative approaches.

Economic and Life Cycle Evaluation of Municipal Solid Waste Management in Alachua County and Assessment of Alternative Solid Waste Approaches to Increase Recycling Rates, Alachua County Department of Solid Waste Management

May 2017- March 2018

- Similar methodology and research scope to Polk County project but for data and context of Alachua County.

Economic and Life Cycle Evaluation of Municipal Solid Waste Management in Escambia County and Assessment of Alternative Solid Waste Approaches to Increase Recycling Rates, Escambia County **May 2017- December 2017**

- Similar methodology and research scope to Polk County project but for data and context of Escambia County.

Economic and Life Cycle Evaluation of Municipal Solid Waste Management in Sarasota County and Assessment of Alternative Solid Waste Approaches to Increase Recycling Rates, Sarasota County Department of Solid Waste Management

May 2017- December 2017

- Similar methodology and research scope to Polk County project but for data and context of Sarasota County.

Economic and Life Cycle Evaluation of Municipal Solid Waste Management in Palm Beach County and Assessment of Alternative Solid Waste Approaches to Increase Recycling Rates, Solid Waste Authority of Palm Beach County

May 2017- December 2017

- Similar methodology and research scope to Polk County project but for data and context of Palm Beach County.

The Economic and Environmental Benefits of Recycling Asphalt Shingles in California, Zanker Materials Recovery and Landfill: Zanker Recycling **January 2017- May 2017**

- Estimated the environmental/ economic benefits of asphalt shingle recycling in California in 2017, in terms of landfill diversion, greenhouse gas emission reduction, energy reduction, job creation, and economic output. The recycling benefits were based on estimated asphalt shingle waste generation, conducted through a study-developed method.

The Benefits of Construction and Demolition Materials Recycling in the United States, Construction and Demolition Recycling Association **2016-2017**

- Provided a whitepaper that included an assessment of the benefits of the C&D recycling industry in the US in 2014. The data from C&D industry and literature were used to quantify the total C&D materials stream generated and disposed of mass footprints, then using an LCA model the environmental footprints were estimated, and the landfill space savings, jobs produced, and recycling revenue generated were estimated using a developed method.

Florida Solid Waste Management: State of the State, Hinkley Center for Solid and Hazardous Waste Management

October 2016- September 2018

- Investigated and reported on the mass flows of solid waste in Florida in 67 counties. Conducted a comprehensive analysis on the economic feasibility of available strategies and technologies for solid waste management in Florida, along with an LCA evaluation of the environmental footprints of these approaches, and the potential to meet Florida 75% recycling rate target.

CONFERENCE PRESENTATIONS

In addition to presenting research at the below conferences/workshops, I presented at local Florida County Commissioner Meetings, conducted presentations for each of the projects above to each funding organization, and am well-versed in poster presentations.

Air and Waste Management Association Annual Conference 2021, Online Portal **June 16, 2021**

- *How Does it Work? Recycling: Environmental Assessment of Recycling*

Recycle Florida Today: 2021 Virtual Conference and Annual Business Meeting, Online Portal **June 8, 2021**

- *Moving Sustainability Forward – Efforts by the Public Sector and Tools Available to Help the Cause*

SWANA Hinkley Center Research Symposium, Online Portal **October 13, 2020**

- *An Integrated Tool for Local Government to Track Materials Management and Progress toward Sustainability Goals*

2020 Virtual Conference and Exhibition, Online Portal **September 22, 2020**

- *Florida Recycling Workgroup… Moving recycling forward beyond 2020 – SMM Committee*

Postponed 2020 International Conference on Resource Sustainability, Dublin, Ireland **Originally July 2020**

- *Tools to Measure SMM: Waste LCA Models and Their Place in Waste Decision Making*

2020 SWM-LCA Workshop, Washington D.C. **March 11, 2020**

- *Looking beyond Florida's 75% Recycling Goal: Development of a Methodology and Tool for Assessing Sustainable Materials Management Recycling Rates in Florida*

Resource Recycling Conference and Trade Show, New Orleans, Louisiana **August 27, 2019**

- *Evaluating Life Cycle Thinking In Solid Waste Management Decision Making*

International Solid Waste Association 2018 World Congress, Kuala Lumpur, Malaysia **October 23, 2018**

- *Incorporating Life Cycle Thinking in Solid Waste Management Policy*

2nd Conference on Life Cycle Assessment of Waste, Copenhagen, Denmark **June 22, 2018**

- *Replacing Recycling Rates with Life Cycle Metrics as Government Materials Management Targets*

2018 SWANA FL Annual Conference, Palm Beach, Florida **May 31, 2018**

- *Project Update: Incorporating Life Cycle Thinking into the Solid Waste Management Industry and Policies*

REFEREED PUBLICATIONS (CHRONOLOGICAL)

The following below are published or under-review manuscripts. I am currently working on five other manuscripts in-addition to be submitted this year.

1. **Anshassi, M.**; Smallwood, T., and Townsend, T.G. (2021) "Life Cycle Comparison of MSW Landfilling versus Incineration: Expected Outcomes Based on US Landfill Gas Regulations". Under Review Journal of Waste Management.
2. Wasserman, M.; **Anshassi, M.**, and Townsend, T.G. (2021) "Assessing Sample Number Requirements for Municipal Solid Waste Composition Studies". Under Review Journal of Hazardous, Toxic, and Radioactive Waste.
3. **Anshassi, M.**; and Townsend, T.G. (2021) "A review of LCA assumptions impacting whether landfilling or incineration results in less greenhouse gas emissions". Journal of Resources, Conservation and Recycling. https://doi.org/10.1016/j.resconrec.2021.105810
4. **Anshassi, M.**; and Townsend, T.G. (2021) "Reviewing the Underlying Assumptions in Waste LCA Models to Identify Impacts on Waste Management Decision Making". Journal of Cleaner Production. https://doi.org/10.1016/j.jclepro.2021.127913
5. **Anshassi, M.**; Preuss, B.; and Townsend, T.G. (2021) "Moving Beyond Recycling: Examining Steps for Local Government to Integrate Sustainable Materials Management". Journal of Air and Waste Management Association. https://doi.org/10.1080/10962247.2021.1924312
6. Cline, C.; **Anshassi, M.**; Laux, S.; and Townsend, T.G. (2019) "Characterizing municipal solid waste component densities for use in landfill air space estimates". Journal of Waste Management and Research. https://doi.org/10.1177%2F0734242X19895324
7. **Anshassi, M.**; Laux, S.; and Townsend, T.G. (2019) "Approaches to integrate sustainable materials management into waste management planning and policy". Journal of Resources, Conservation and Recycling. https://doi.org/10.1016/j.resconrec.2019.04.011
8. **Anshassi, M.**; Laux, S.; and Townsend, T.G. (2018) "Replacing recycling rates with life-cycle metrics as government materials management targets". Journal of Environmental Science and Technology. https://doi.org/10.1021/acs.est.7b06007

TEACHING & LEADERSHIP EXPERIENCE

Sustainable Material Management Committee Lead Chair, *Florida Recycling Partnership,* FL **Present**

- Co-chair leader that facilitates discussion with stakeholder members on methods to incorporate sustainable materials management into Florida recycling policy.

Invited Guest Lecturer, *Solid and Hazardous Waste Management*, University of Florida **Spring 2018, 2019, 2020**

- Lectured to a group of undergraduate and graduate students on the fundamentals of a waste LCA, provided a tutorial of the WARM waste LCA model, assigned and created a homework assignment, and created corresponding exam problem.

Invited Guest Lecturer, *Life Cycle Assessment***,** University of Florida **Fall 2019**

- Lectured to graduate students on the fundamentals of conducting an LCA as directed in the ISO 14040 guidelines.

Membership and Education Committee Chair, *Recycle Florida Today,* Tampa, FL **Spring 2017-Fall 2018**

- Co-chair of Recycle Florida Today, established new members and organized webinars relating to solid waste.

Teaching Assistant, *Air Pollution Control Devices,* Gainesville, FL **Fall 2018**

- Provided teaching assistance to 50 undergraduates and graduates on the fundamentals of the control mechanisms and the design procedures of the various control technologies following ABET requirements. During the semester I created and graded homework problems and exams, and I occasionally lectured for the professor.

Teaching Assistant, *Water and Wastewater Treatment Design,* Gainesville, FL **Fall 2016**

- Provided teaching assistance to 110 undergraduates and graduates on the design and concepts of water and wastewater treatment following ABET requirements. During the semester I graded the water and wastewater design portfolios for each student team, created and graded exams, and provided lecture presentation assistance to the professor.

RELAVANT ACADAMIC PROJECTS

Developing Country Solid Waste Capstone, *Department of Environmental Engineering*, University of Florida **Spring 2017**

- Collaborated with a team of 5 peers to design an integrated waste management system consisting of an economic, environmental, and social analysis of waste management scenarios. Corresponded with local government in Puebla, ME, and traveled there to implement the scenarios through governmental regulatory agencies, engineering, and construction firms.

CDRA C&D Debris Recycling Benefit, *Department of Environmental Engineering*, University of Florida **Spring 2017**

- Estimated C&D Debris waste generation in the US for 2014 and quantified the environmental and economic benefits associated with recycling C&D Debris.

Asphalt Shingles Recycling Benefit, *Department of Environmental Engineering*, University of Florida **Spring 2017**

- Estimated asphalt shingles waste generation in CA for 2017, and calculated the environmental and economic benefits associated with recycling asphalt shingles to be used to support asphalt shingles reuse in CA.

Environmental International Challenge, *Air and Waste Management Association*, University of Florida **Fall 2016**

- Successfully oversaw a technical design team on a statewide student competition to reduce ozone levels between the US and ME, in which we won first place. Lead the technical side of modeling and monitoring equipment planning to reduce ozone levels.

HONORS AND AWARDS

Nominee for Social Media Spotlight UN's International Day of Women and Girls in Science, University of Florida **Spring 2020**

Florida Section A&WMA Scholarship Award, Air and Waste Management Association **Fall 2020**

CDM Smith Fellowship Award, CDM Smith **Spring 2017**

Ramage Spangler Scholarship, University of Florida **Spring 2017**

PROFESSIONAL ASSOCATIONS

Air and Waste Management Association **Fall 2016-Present**

Recycle Florida Today **Spring 2017-Present**

Florida Recycling Partnership **Fall 2017-Present**

Solid Waste Association of North America **Spring 2018-Present**

Derek A. Henderson, Ph.D.

Professional Preparation

University of Virginia	Charlottesville, VA	Civil Engineering	Ph.D.	2015
Oklahoma State University	Stillwater, OK	Environmental Engineering	MS	2007
Oklahoma State University	Stillwater, OK	Civil Engineering	BS	2006
Oklahoma State University-IT	Okmulgee, Ok	Construction Management	AS	2000

Appointments

2021 – Present	Assistant Professor, Environmental Engineering Dept., Florida Polytechnic University
2019 – 2021	Environmental Lab Manager, Dept. of Engineering Systems and Environment, Univ. of Virginia
Spring 2018	Instructor, Dept. of Civil & Environmental Engineering, Univ. of Virginia
2016 – 2018	Research Associate, Dept. of Civil & Environmental Engineering, Univ. of Virginia
2011 – 2015	Research Assistant, Dept. of Civil & Environmental Engineering, Univ. of Virginia
2008 – 2009	Environmental Engineer, Conestoga-Rovers and Assoc., Chicago, IL
2006 – 2007	Research and Teaching Assistant, Dept. of Civil & Environmental Engineering, Oklahoma State Univ.

Research Interests

Low impact development design, performance, and life cycle, particularly with respect to transportation infrastructure

Vegetative extraction of water and soil contaminants

Operation management and design enhancement impacts to low impact development practices

Water and soil quality analysis using various methods including atomic absorption and chromatography

Publications

Hayes, G. M., Burgis, C., Zhang,W., Henderson, D.A., Smith, J.A. (2021) "Runoff reduction by four green stormwater infrastructure systems in a shared environment." Sustainable Water in the Built Environment. Vol 7, Issue 2. doi:10.1061/JSWBAY.0000932

Burgis, C.R., Hayes, G., Henderson, D.A., Zhang, W., Smith, J.A. (2020) "Green Stormwater Infrastructure Buffers Surface Waters from Road Salt Loading." Science of the Total Environment. 729. 138736

Burgis, C.R, Hayes, G.M., Zhang, W., Henderson, D.A., Smith, J.A., (2020) "Tracking Denitrification in Green Stormwater Infrastructure with Dual Nitrate Stable Isotopes" Science of the Total Environment, https://doi.org/10.1016/j.scitotenv.2020.141281

Henderson, D.A., Smith, J.A., Moruza, G., Burgis, C., (2019) "Low Impact Development Technologies for Highway Stormwater Runoff." Encyclopedia of Water: Science, Technology, and Society.

Henderson, D.A., Smith, J.A., and Fitch, G.M., (2016) "Impact of Vegetation Management on Vegetated Roadsides and Their Performance as a Low-Impact-Development Practice for Linear Transportation Infrastructure." Transportation Research Record, DOI: 10.3141/2588-19.

Henderson, D.A. (2015) "Performance and Feasibility Study of Vegetated Roadsides as a Low-Impact-Development Practice for Linear Transportation Systems." PhD Dissertation, University of Virginia, Civil and Environmental Engineering.

Pending Publications

Hayes, G., Burgis, C.R., Henderson, D.A., Zhang, W., Smith, J.A. (2021) "Evidence of Metal Mobilization in Groundwater, Soils, and Stormwater by Road Salt Activity." Journal: TBD, (manuscript in preparation)

Hayes, G., Burgis, C.R., Henderson, D.A., Zhang, W., Smith, J.A. (2020) "Green Infrastructure Demonstrates Variable Mitigation of Fecal Contamination in Stormwater." Sustainable Water in the Built Environment. (in review)

Presentations

* denotes presenter

Conference Presentations

Zhang, W.*, Burgis, C., Hayes, G. M., Henderson, D.A., Smith, J.A., "Water Quality Performance of Green Stormwater Infrastructure along Lorton Road". Session 11. Poster presentation (abstract submission) at the American Water Resources Association's Annual

Water Resources Conference. Salt Lake City, Utah, November 2019. (won the Student Poster Runner-up Award).

Hayes, G. M.*, Burgis, C., Zhang, W., Henderson, D.A., Smith, J.A., “Comparing flow reductions of four green infrastructure systems in a roadside environment and early results from groundwater monitoring receiving infiltrated runoff”. Session 12. Lectern presentation (abstract submission) at the American Water Resources Association’s Annual Water Resources Conference. Salt Lake City, Utah, November 2019.

Hayes, G.*, Burgis, C., Henderson, D.A., Smith, J.A., Low-Impact Development for Roadside Stormwater Management: Performance of Several Stormwater Control Techniques in a Shared Watershed. P19-20488. Lectern presentation (abstract submission) at Transportation Research Board Annual Meeting. Washington, DC, January 2019.

Burgis,. C.*, Hayes, G., Henderson, D.A., Smith, J.A., Assessment of Green Infrastructure Practices on Lorton Road, Fairfax County, VA. ASCE Environmental & Water Resources Institute International Low Impact Development Conference, Nashville, Tennessee, August 14, 2018

Hayes, G.*, Burgis, C., Henderson, D.A., Smith, J.A., Low Impact Development in Highway Stormwater Management: A Virginia Case Study. Lectern presentation (abstract submission) at Environment & Water Resources Institute (ASCE) Operation & Maintenance of Stormwater Control Measures Conference. Denver, CO, November, 2017

Henderson, D.A.*, Smith, J.A., Fitch, G.M., Impact of Vegetation Management on Vegetated Roadsides and Their Performance as a Low-Impact-Development Practice for Linear Transportation Infrastructure. Transportation Research Board, Washington D.C., January 12, 2016

Henderson, D.A.*, Smith, J.A., Fitch, G.M., Long Term Performance Study of Various Low-Impact-Development Practices for Linear Transportation Systems. Mid-Atlantic Chapter - International Erosion Control Association, Annapolis, Maryland, September 21, 2016

Henderson, D.A.*, Smith, J.A., Fitch, G.M., Impact of Vegetation Management on Vegetated Roadsides and Their Performance as a Low-Impact-Development Practice for Linear Transportation Infrastructure. Environmental & Water Resources Institute International Low Impact Development Conference, Portland, Maine, August 30, 2016

Henderson, D.A.*, Smith, J.A., Fitch, G.M., Impact of Vegetation Management on Vegetated Roadsides and Their Performance as a Low-Impact-Development Practice for Linear Transportation Infrastructure. Environmental & Water Resources Institute International Low Impact Development Conference, Houston, Texas, January 20, 2015

Invited Presentations

Henderson, D.A.*, Smith, J.A., Fitch, G.M, Burgis, C., Hayes, G., Low Impact Development Performance Study. University of Virginia Post-Doctoral Flash Presentation Symposium, Charlottesville, Virginia, June 21, 2018.

Henderson, D.A.*, Smith, J.A., Burgis, C., Fitch, G.M, Lorton Road Widening Low Impact Development (LID) Study. Virginia Transportation Research Council Environmental Research Advisory Council, Charlottesville, Virginia, May 6, 2016

Henderson, D.A.*, Smith, J.A., Fitch, G.M., Lorton Road Widening Low Impact Development (LID) Study. Virginia Center for Transportation Innovation and Research (VCTIR) Environmental Research Advisory Council (ERAC). June 2, 2015

Henderson, D.A.*, Vegetated Roadsides' Runoff Mitigation Performance. University of Virginia Graduate Research Symposium, February 27, 2015 (Poster).

Henderson, D.A.*, Smith, J.A., Fitch, G.M., Lorton Road Widening Low Impact Development (LID) Study. Virginia Center for Transportation Innovation and Research (VCTIR) Environmental Research Advisory Council (ERAC). May 15, 2014.

Teaching Experience

Instructor, CEE 5040: Groundwater Hydrology and Contaminant Transport, University of Virginia, Spring 2018.

Teaching Assistant, APMA 1110: Calculus II, University of Virginia, Spring 2013

Guest Lecturer, ENGR 1620: Introduction to Engineering, University of Virginia, October 17, 2013

Teaching Assistant, APMA 2130: Differential Equations, University of Virginia, Fall 2011

Teaching Assistant, CIVE 4833: Unit Operations in Civil Engineering, Oklahoma State University, Spring 2007

Teaching Assistant, Introduction to Environmental Engineering, Oklahoma State University, Fall 2006

Awards and Special Recognition

Honorable Mention, University of Virginia Graduate Research Symposium, Spring 2015.

Sergeant-at-Arms, Chi Epsilon Civil Engineering National Honor Society, 2006

Professional Activities

Building Zone Committee Chair: Assist in development, review, approval, and implementation for all COVID safety plans for Olsson Hall, Thornton Hall B & D-Wing and all research activities – 2020 to present

Reviewer for *Environmental Science: Water Research and Technology* (1), *Journal of Environmental Engineering* (1), *Environmental Pollution* (1).

Judge, University of Virginia Engineering Research Symposium, Charlottesville, Virginia, Aril 7, 2020

Judge, University of Virginia Engineering Research Symposium, Charlottesville, Virginia, March 28, 2019

ASCE Associate Member 2020

Certified LabVIEW Associate Developer 2017

40-hour hazardous waste operator certification 2008

Contributor, Oklahoma Transportation Center – Federal Transportation Administration Risk Assessment Tool, 2007

Engineering Intern certification 2007

ELISABETH KAMES, Ph.D.

Professional Contact
4700 Research Way
Department of Mechanical Engineering
Lakeland, FL. 33805

Personal Contact
1720 Hamilton Ave. SW
Palm Bay, FL. 32908
Cell: (630) 476 -1265

EDUCATION

Ph.D., Mechanical Engineering May 2020
Florida Institute of Technology Melbourne, FL
Dissertation: Examining the Impact of Student Motivation on Performance in Mechanical Engineering Design Courses
Advisor: Beshoy W. Morkos, Ph.D.

M.S., Mechanical Engineering December 2016
Florida Institute of Technology Melbourne, FL
Concentration in Dynamic Systems, Robotics and Controls

B.S., Mechanical Engineering (cum laude) May 2015
Florida Institute of Technology Melbourne, FL

ACADEMIC APPOINTMENTS

Florida Polytechnic University Lakeland, FL.
Assistant Professor March 2021 – Present

Florida Polytechnic University Lakeland, FL.
Visiting Assistant Professor August 2020 – March 2021

Florida Institute of Technology Melbourne, FL.
Visiting Instructor August 2019 – May 2020

ACADEMIC EXPERIENCE

Florida Polytechnic University Lakeland, FL.
Assistant Professor March 2021 – present

- Serve as an assistant professor in the Department of Mechanical Engineering
- Conducting research on persistence and retention in mechanical engineering

Florida Polytechnic University Lakeland, FL.
Visiting Assistant Professor August 2020 – March 2021

- Served as a visiting assistant professor in the Department of Mechanical Engineering for the 2020-2021 academic year
- Taught three courses during the fall semester and three courses in the spring semester
- Conducting research on persistence and retention in mechanical engineering

Florida Institute of Technology Melbourne, FL.
Visiting Instructor August 2019 –May 2020

- Served as a visiting instructor in the Department of Mechanical and Civil Engineering for the 2019-2020 academic year
- Taught, as the instructor on record, seven different courses throughout the year to over 300 students
- Secured $60K in industry funding for student capstone projects

Florida Institute of Technology Melbourne, FL.
Graduate Research Assistant May 2015 – May 2020

- Worked with Dr. Beshoy Morkos on industry (~$300K) and federally (~$1M) funded projects. Work included learning how to write grants, executing the research, and leading multiple research teams.

- Developed research tools, methods, and techniques as part of research findings.
- Presented work at multiple American Society for Engineering Education (ASEE) Annual Conferences (where some of my papers were selected as the best within division), American Society of Mechanical Engineers International Design Engineering Technical Conferences & Computers and Information in Engineering Conference (ASME IDETC/CIE)
- Published work in relevant journals such as the International Journal of Engineering Education

PROFESSIONAL EXPERIENCE

Engineer in Training No. 1100022752, Florida 2019

Structural Composites/Compsys, Inc. Melbourne, FL.

Composite Engineering Intern 2016 – 2019

- Designed and developed machinery to facilitate and automate composite manufacturing projects
- Developed and manufactured tooling for projects for the U.S. Navy, Lockheed Martin, and Wabash National Corporation

TEACHING EXPERIENCE

Instructor on record: 11 unique courses
Graduate Assistant: 8 unique courses

Florida Polytechnic University – Mechanical Engineering Lakeland, FL.

Professor – EGN 2002C – Skills and Design 2 Spring 2021

- Taught two sections of Skills and Design 2
- Lectured to freshman/sophomore level students on the fundamentals of design and manufacturing
- Overviewed the importance of Geometric Dimensioning and Tolerancing on part creation
- Organized and executed a small design project (miniature catapults) to showcase dynamics principles

Professor – EML 3811 – Mechatronics Spring 2021

- Taught EML 3811 to upper-level undergraduate students in a FLEX modality
- Topics included sensors and signal conditioning, digital signals and logic, actuation, first-order and second-order engineering system models, and transfer functions
- Delivered class syllabus, material, homework problems, quizzes, exams, and semester project

Professor – EGN 2001C – Skills and Design 1 Fall 2020/Fall 2021

- Taught two sections of Skills and Design 1 in two different modalities (online and FLEX section)
- Lectured to freshman/sophomore level students on the fundamentals of design
- Facilitated the use of Solidworks for 3D modeling and design
- Organized and executed a small manufacturing project (manila folder bridge) to showcase statics principles

Professor – EML 4500 – Design and Analysis of Machine Components Fall 2020/Fall 2021

- Taught EML 4500 during the fall semester to 18 undergraduate students in a FLEX modality
- Educated students on the fundamentals of the design of basic machine elements, emphasizing failure prevention for static and variable loading scenarios
- Topics included permanent and nonpermanent joints, springs, bearings, gears, clutches, flywheels, and geometric dimensioning and tolerancing
- Prepared class syllabus, material, homework problems, quizzes, exams, and semester project

Florida Institute of Technology – Mechanical Engineering Melbourne, FL.

Instructor – MEE 4193/4194 – ME Design 1 & 2 (Capstone Design) Fall 2019/Spring 2020

- Secured $60K in competitive funding (not donations) to support industry funded student projects
- Organized student project teams based on student skillsets and interests
- Procured funding from 4 industry sponsors for student projects
- Oversaw 109 students on 11 different senior capstone design teams

- Lectured on engineering design and proper design procedures

Instructor – MEE 4190 – Design Methodologies (Junior Design) Spring 2020

- Taught MEE 4190 during the spring semester to 84 undergraduate students
- Assigned student project teams based on student skillsets and interests
- Prepared class syllabus, material, homework problems, and three miniature, group projects to prepare students for capstone design

Instructor – MEE 3090 – Design of Machine Elements Fall 2019

- Taught MEE 3090 during the fall semester to 56 undergraduate students
- Lectured and educated students on the fundamentals of engineering mechanics and the design of basic machine elements, emphasizing failure prevention
- Prepared class syllabus, material, homework problems, quizzes, exams, and semester project

Instructor – MEE 1025 – ME Practicum 1 Fall 2019

- Lectured to freshman level students on the fundamentals of the design process and design principles
- Advised students on their project work, interfacing with senior level students to assist with capstone design

Instructor – MEE 2025 – ME Practicum 2 Fall 2019

- Lectured to sophomore level students on the fundamentals of the design process and design principles
- Advised students on their project work, interfacing with senior level students to assist with capstone design

Instructor – MEE 3025 – ME Practicum 3 Fall 2019

- Lectured to junior level students on the fundamentals of the design process and design principles
- Advised students on their project work, interfacing with senior level students to assist with capstone design projects

Graduate Teaching Assistant Fall 2015 – Spring 2019

- Served as a teaching assistant to multiple engineering courses at all curriculum levels
- Classes included: Statics, Dynamics, Computer Aided Engineering, Design Methodologies, Mechanical Vibrations, Control Systems, Mechanical Engineering Design 1, and Mechanical Engineering Design 2

Graduate Advisor – MEE 4193/MEE 4194 – Senior Capstone Design Fall 2015 – Spring 2019

- Advised multiple student teams as a Graduate Student Advisor for Mechanical Engineering Design 1 and 2
- Interfaced with over 50 student teams (~400 students)
- Interfaced with both industry and federal industry sponsored project liaisons
- Completed ordering, oversaw student project progress, and advised students to successful project completion

PUBLICATIONS

Journal Publications (2 published, 2 accepted pending revision, 6 in preparation)

1. Hein, P.H., **Kames, E.**, Cheng, C. Morkos, B. (2021), Employing Machine Learning Techniques to Assess Requirement Change Volatility. *Research in Engineering Design*, 32(2), 245-269 doi: 10.1007/s00163-020-00353-6
2. **Kames, E.**, Morkos, B., Bessette, A. (2019), The Implementation of an Intervention Plan to Improve Student Motivation and Performance in Mechanical Engineering Senior Design Capstone. *International Journal of Engineering Education*. Volume 35, No. 3, pp. 779-794
3. Shah, D., **Kames, E.,** Morkos, B. Neurocognitive Effects of Incentivizing Students to Improve Performance through Repeat Attempts, Journal of Computing and Information Science in Engineering (*Revisions)*
4. Hein, P.H., **Kames, E.,** Morkos, B., Exploring Artificial Neural Networks and Complex Network Metrics to Predict Requirement Change Volatility, Journal of Mechanical Design *(Revisions).*
5. **Kames, E.,** Shah, D., Morkos, B. A Mixed Methods Analysis Examining the Impact of Motivation Factors in Senior Capstone Design Courses. Journal of Engineering Education *(In preparation)*
6. **Kames, E.,** Shah, D., Morkos, B. Examining the Impact of Student Motivation Factors on Performance and Persistence in Design Courses. Journal of Engineering Education *(In preparation)*
7. Shah, D., **Kames, E,** Morkos, B., Student Motivation in Engineering Capstone Design: A Convergent Mixed Methods Study Comparing Industry and Non-Industry Sponsored Projects. Journal of Mechanical Design (JMD-21-1088) (*Revisions*)

8. Hein, P.H., **Kames, E.,** Morkos, B., Investigation of Requirement Change Propagation using Complex Network Metrics and Network Interference Method, Journal of Mechanical Design *(In preparation)*
9. Shah, D., **Kames, E.**, Clark, M., Development of an Interview Protocol and Formal Coding Scheme for use in Qualitative Data Collection in Design Courses, Journal of Mechanical Design *(In preparation)*
10. Hein, P.H., **Kames, E.,** Morkos, B., Computational Support for Predicting Requirement Change Volatility using Complex Network Metrics, Journal of Mechanical Design *(In preparation).*

Conference Proceedings (12 published, 1 in preparation)

1. **Kames, E.**, Shah, D., Morkos, B. Examining the Effect of Negative Design Stimuli on Perception of Peer Contribution in Design Settings. (*In preparation for the 2022 ASEE Annual Conference & Exposition)*
2. Shah, D., **Kames, E.**, Morkos, B. (2021) Neurocognitive Effects of Incentivizing Students to Improve Performance through Repeat Attempts in Design Settings. ASME International Design Engineering Technical Conferences and Computers and Information in Engineering Conference.
3. Shah, D., **Kames, E.**, Morkos, B. (2021) Impact of Educators Changing Student Motivation: A Study of Transient Factor Correlation and Orthogonality. Paper presented at the 2021 ASEE Annual Conference & Exposition, Virtual.
4. **Kames, E.**, Shah, D., Clark, M., Morkos, B. (2019), A Mixed Methods Analysis of Motivation Factors in Senior Capstone Design Courses. Paper presented at 2019 ASEE Annual Conference & Exposition, Tampa, Florida. ***(selected as one of the top 5 papers in Division out of >120 submission)***
5. Shah, D., **Kames, E.**, Clark, M., Morkos, B. (2019), Examining the Differences in Student Motivation for Industry Projects in Senior Capstone Design. Paper presented at 2019 ASEE Annual Conference & Exposition, Tampa, Florida.
6. Shah, D., **Kames, E.**, Clark, M., Morkos, B. (2019), Development of a Coding Scheme for Qualitative Analysis of Student Motivation in Senior Capstone Design. ASME. International Design Engineering Technical Conferences and Computers and Information in Engineering Conference.
7. Clark, M., Shah, D., **Kames, E.**, Morkos, B. (2019), Developing Interview Protocol for Engineering Capstone Design Courses. ASME. International Design Engineering Technical Conferences and Computers and Information in Engineering Conference.
8. Madison, A., Koren, K., **Kames, E.**, Morkos, B. (2019), Examining the Effect of Friction During Dry Sliding on Select Thermoplastics. ASME. International Design Engineering Technical Conferences and Computers and Information in Engineering Conference.
9. **Kames, E.**, Shah, D., Morkos, B. (2018), A Longitudinal Study Exploring Motivation Factors in Cornerstone and Capstone Design Courses. Paper presented at 2018 ASEE Annual Conference & Exposition, Salt Lake City, Utah.
10. **Kames, E.**, Thiess, D., Morkos, B. (2018), Learning by Doing: A Simple Educational Method for Modelling Vehicle Suspensions. ASME International Design Engineering Technical Conferences and Computers and Information in Engineering Conference.
11. **Kames, E.**, Thiess, D., Kepinski, P., Zaremba, R., Morkos, B. (2018), Simulating Occupant Response to Low Speed, Automotive Rear-End Collisions. ASME International Design Engineering Technical Conferences and Computers and Information in Engineering Conference.
12. **Kames, E.**, Zaremba, R., Morkos, B. (2017), Analyzing Composite Material Manufacturing Methods Using Failure Modes Effect Analysis. ASME International Design Engineering Technical Conferences and Computers and Information in Engineering Conference.
13. Schmitt, E., **Kames, E.**, Morkos, B., Conway, T. A. (2016), The Importance of Incorporating Designer Empathy in Senior Capstone Design Courses. Paper presented at 2016 ASEE Annual Conference & Exposition, New Orleans, Louisiana.

Poster Sessions (1 posters)

1. **Kames, E.**, "Examining the Effect of Student Motivation on Academic Performance in Design Courses," *ASME International Design Engineering Technical Conference*, Quebec City, Quebec, 2018.

Award Papers (3 papers)

1. **Kames, E.,** "Addressing the Possibilities: The Benefits of the Implementation of Artificial Intelligence in Engineering Design Education," ASEE Annual Conference, Tampa, FL, 2019.
2. **Kames, E.**, "Next Generation Robotic Applications for Design and Manufacturing," ASME International Design Engineering Technical Conference, Cleveland, OH, 2017.
3. **Kames, E.** and Patel, D., "Internet of Things in Manufacturing," ASME International Design Engineering Technical Conference, Charlotte, NC, 2016.

FUNDING SECURED

Total: $60,000 (Kames as PI: $60,000)

- **Kames, E.,** (PI), 2019, "Design of Beam Data Scanning System – Phase II", **Sun Nuclear Corporation**, $15,000
- **Kames, E.,** (PI), 2019, "Design and Analysis of Complex System" (Title Removed for Restrictions), **Lockheed Martin**, $15,000
- **Kames, E.,** (PI), 2019, "Design and Analysis of Complex System" (Title Removed for Restrictions), **US Navy**, $15,000
- **Kames, E.,** (PI), 2019, "System Optimization Through Use of Additive Manufacturing", **Leonardo DRS**, $15,000

HONORS, ACTIVITIES, AND SERVICE

Awards

- Best of Design Engineering Education Division (from >120 submission) for "A Mixed Methods Analysis of Motivation Factors in Senior Capstone Design Courses" at 2019 ASEE Annual Conference & Exposition
- Recipient of 2019 ASEE DEED Graduate Design Essay Competition for "Addressing the Possibilities: The Benefits of Implementing Artificial Intelligence in Engineering Design Education," Tampa, FL
- Recipient of 2018 ASME IDETC/CIE CAPP Graduate Research Poster Award for "Examining the Effect of Student Motivation on Academic Performance in Design Courses," Quebec City, Quebec, Canada
- Recipient of 2017 NSF Graduate Design Essay Competition for "Next Generation Robotic Applications for Design and Manufacturing," ASME International Design Engineering Technical Conference. Cleveland, OH
- **NSF Graduate Research Fellowship Program Honorable Mention**, 2016
- Recipient of 2016 NSF Graduate Design Essay Competition for "Internet of Things in Manufacturing," ASME International Design Engineering Technical Conference. Charlotte, NC
- Recipient of 2015 ASME Graduate Student of the Year Award recipient at Florida Institute of Technology
- Pi Tau Sigma Mechanical Engineering Honor Society inductee at Florida Institute of Technology
- Tau Beta Pi Engineering Honor Society inductee at Florida Institute of Technology

Publications Reviewed

Conference Proceedings

- International Design Engineering Technical Conference
- International Conference on Engineering Design
- American Society for Engineering Education

Journal Submissions

- ASME Journal of Mechanical Design
- ASME Journal of Medical Devices

Memberships

- Member, American Society of Mechanical Engineers, ASME — 2011 – Present
- Member, Society for Women Engineers, SWE — 2011 – Present
- Member, Order of the Engineer — 2013 – Present
- Member, American Society for Engineering Education, ASEE — 2016 – Present
- Member, Astrobiology Research and Education Society, ARES — 2016 – Present
- Member, Society of Automotive Engineers, SAE — 2019 – Present

Community Activities

- Volunteer/Mentor, FIRST Robotics — 2010 – Present

FELLOWSHIPS AND AWARDS

- ASEE Travel Award **$500** — July 2019
- ASME CIE Travel Award **$750** — August 2018
- NSF/ASME Travel Award **$1,250** — August 2017

- NSF/ASME Travel Award **$1,250** August 2016

SKILLS AND QUALIFICATIONS

Computer

- Solidworks
- AutoDesk Inventor
- Creo/ProE
- R/RStudio
- C++
- ANSYS APDL
- ANSYS Workbench
- AMESim
- MATLAB
- Microsoft Office

Engineering

- Technical drawing
- Geometric dimensioning & tolerancing (GD&T)
- Analysis
- Composite design
- Graphical synthesis
- Rapid prototyping
- Statistical data analysis

Mechanical

- Machine shop
- CNC machines
- Composite work

Jun Kim, Ph.D.

335 Haskins Ct SE, Ada, MI 49301 jun@alumni.rice.edu www.linkedin.com/in/jkwater

Education

2015-2020 **Rice University**, Houston, TX
Ph.D. in Environmental Science & Engineering (GPA: 3.86/4)

2005-2007 **Gwangju Institute of Science and Technology (GIST)**, Gwangju, S. Korea
M.S. in School of Environmental Science and Engineering, Summa Cum Laude (4.00/4)

2000-2005 **Handong Global University (HGU)**, Pohang, S. Korea
B. Eng. in Environmental Eng. & Civil Eng, *Minor in Computer Science*

Professional Experience

2020-present **Committee Member, Education and Training Council, MI-AWWA**, Grand Rapids, MI
Research & Treatment Practices:
focuses on current research and leading treatment practices for emerging contaminants.
Reviews the CEC course materials and provides feedbacks.

2020-present **Water Sciences Committee Member, Water Quality Association (WQA)**, Lisle, IL
Manages the technical and scientific tasks of WQA.
Provides advice to the Water Quality Research Foundation (WQRF) research projects.
Provides semi-annual reports to the Board of Directors.

2021-present **HQ Representative for Ext Stakeholders, Access Business Group**, Ada, MI
2020-present **Lead, Simulation Center of Excellence (CoE)**
2019-present **Product Design Engineer**
HQ Point of Contact for NSF International and Water Quality Association (WQA).
Manage research collaborations with National Labs, Universities, Governments, NPOs.
Lead product development projects and coordinate team members
Develop heavy metal and oxyanion removal adsorbents.
Investigate PFASs adsorption mechanism.
Co-develop novel water treatment process using nanomaterials.
Developed 3D COMSOL simulation models for water filtration reactors.
Completed mechanistic investigations on organic/inorganic adsorption in porous media.
1 Patent, 6 peer-reviewed publications, 3 conference presentations, 4 awards.

2015-2019 **PhD Researcher, National Science Foundation (NSF) Engineering Research Center (ERC) for Nanotechnology-Enabled Water Treatment (NEWT)**, Houston, TX
Developed transformative and off-grid water treatment systems: Capacitive deionization (CDI), photo-thermal disinfection reactor (PTDR), microbial fuel-cell (MFC), ion-selective membrane, graphene/CNT electrodes.
1 Patent, 7 peer-reviewed publications, 6 conference presentations, 8 awards.

2011-2015 **Research Engineer III, Doosan Hydro Technology**, Tampa, FL
Developed patented high-rate produced water/seawater treatment units
(flotation unit, evaporator, membrane system, pre-/post- treatment units).
Completed vibrating anaerobic membrane bioreactor for Canadian heavy oil site.
1 Patent, 2 peer-reviewed publications, 4 conference presentations, 1 award.

2010-2011 **Research Engineer, LG Advanced Research Institute**, Seoul, South Korea
Characterized PVDF hollow fiber UF polymers and nano-materials
(SEM/EDS, TEM, XRD, XPS, FTIR, Electrophoresis, Dynamic Light Scattering, Zeta-potential Analyzer, UV-Vis Spectroscopy, contact angle goniometry, BET Analyzer)
Developed ultrapure water monitoring system for semiconductor manufacturing
(GC-ECD/MSD, LC-MS, HPLC, ICP-OES/MS, IC, TOC)
1 Patent, 1 conference presentation, 1 performance award, 1 QC award.

2008-2010 **Research Engineer/Project Manager, "S" grade, Woongjin R&D Center**, Seoul, Korea
2007-2008 **Associate Research Engineer**
Performed material/water quality analysis at the Water Quality Association (WQA) Recognized Testing Laboratory (RTL).
Developed filter testing protocols (particulate, turbidity, heavy metals, VOCs, cyst, and P-231).
Identified ion transport through membrane polymer surfaces.
4 Patents, 1 publication, 1 research award, 3 performance awards, 1 QC award.

2005-2007 **MS Research Assistant, GIST**, Gwangju, Korea
National Research Laboratory (NRL) for Applications of Environmental Nanoparticles
Developed an advanced oxidation process (AOP) using reactive iron-oxide nanoparticles.
1 Patent, 2 peer-reviewed publications, 4 awards.

Summer 2004 **Summer Research Intern, Pohang University of Science and Technology (POSTECH)**
Marine Environment Chemistry Lab, Pohang, S. Korea
Participated in optimizing thermodynamic constants in the natural seawater system.

2000-2004 **Undergrad Research Assistant, Aquasen,** HGU, Pohang, Korea
Developed a particle size analyzer sensor
Participated in numerical seawater wave simulation projects for harbor construction sites.

Teaching Experience

2022 Spring **(Appointed) Adjunct Professor, Cornerstone University**, Grand Rapids Main, MI
EGR 437 - Environmental Engineering (4 credit)

2021 Fall **Adjunct Professor, Northwood University**, Midland Main Campus, MI
NSC 2100 - Environmental Science (3 credit)
NSC 4060 - Science & Technology (3 credit)

2016-2018 **Teaching Assistant, Rice University**, Houston, TX

CEVE 535 - Physical Chemical Processes for Water Quality (3 credit)

2016-2018 **Grader, Rice University**, Houston, TX
CEVE 534 - Fate and Transport of Contaminants in the Environment (3 credit)

Fall 2004 **Teaching Assistant, HGU**, South Korea
Academic Writing

Fall 2003 **Teaching Assistant, HGU**, South Korea
English Public Speaking

Spring 2002 **Teaching Assistant, HGU**, South Korea
Internet application techniques

Invited Presentations

October 13, 2021 Industry-Academia-Research Nexus
– CUE 20070 Seminar, HGU

October 20, 2020 Life as a Water Scientist
– CEE 880/881 Seminar in Environmental and Water Resource Engineering (EWRE) Program at University of Michigan, Ann Arbor

February 21, 2020 Transitioning from Academia to Industry: Tips for NEWT Students/Postdocs
– Career Mentoring: Rice University/NEWT Research Center

Honors & Awards

2021 **Next Gen Award – WQA Leadership Awards Winner**
https://www.wqa.org/about-us/leadership-awards/next-gen-award
WQA 2021 Award Recipients
https://www.wqa.org/awards
https://wqa.org/annual?utm_source=home&utm_medium=banner&utm_campaign=annual

2021 **Faces of the Industry: Young Professionals Award – Water Quality Products (WQP)**
https://mydigitalpublication.com/publication/?i=695052
WQP 2021 Young Professionals

2020 **Closing Comment – Rice University** May Graduation Commencement
https://www.youtube.com/watch?v=GYTO1oRVFyQ

2019 **Best Paper Awards – COMSOL 2019 Boston**
https://cee.rice.edu/news/jun-kim-win-best-paper-award-comsol

2019 **Constancio Miranda Fellowship – Doris Duke Charitable Foundation**
https://www.ddcf.org

2018 **Certificate of Merit – American Chemical Society (ACS)**
https://acsenvr.com/website/awards-recognition/certificate-of-merit/

2018 **Best Paper Scholarship – Texas American Water Works Association (AWWA)**
https://engineering.rice.edu/news/kim-wins-best-paper-award

2018 **Korean Honor Scholarship – Embassy of the Republic of Korea**
Embassy of the Republic of Korea
Announcement - KHOUKEC.org
Article - Overseas Korean Journalists Association

2018 **KSEA-KUSCO Scholarship – Korean-American Scientists & Engineers Association**
https://scholarship.ksea.org/Recipients.aspx?ssYear=2018

2017 **International Travel Grant – Rice Engineering Alumni (REA)**
https://alumni.rice.edu/rea/scholarships

2015-2016 **Robert and Eleanor Shubinski Award – Rice University**

2015-2019 **Research Assistantship – Rice University**

2013 **Water Award – Doosan Headquarter**

2012 **Best Performer – LG**

2011 **6 Sigma Best Practice Award – LG**

2010 **The Honor of Top Research Member (R&D Incentive) – Woongjin**

2009 **Best Performer (Promotion) – Woongjin**

2008 **6 Sigma Best Practice Award – Woongjin**

2007 **New Idea Competition Award (1 month International Business Travel) – Woongjin**

2006 **Best Presentation Award – Korean Society of Environmental Engineering**

2006 **Scholarship for Science and Engineering – Korea Public Broadcasting Station (KBS)**

2005-2007 **National Full Scholarship – Ministry of Science and Technology**

2005-2007 **Brain Korea 21 Scholarship – Ministry of Education and Human Resources**

Service and Leadership

2021 **Joint Committee Proxy (for voting-member), NSF DWTU**
NSF JC DWTU Meeting - May 12, 2021

2020-present **Committee Member, Education & Training Council, MI-AWWA**
Material Reviewer - Continuing Education Credit (CED) courses.
Fellowship Committee – AWWA Fellowship for Water Quality & Treatment Research
Moderator - Monthly CED Webinars.

2020-2021 **Task Force Team member, WQA Technical Convention Education**
Reviewed technical tracks and presentation proposals for WQA Convention 2021.

June-July, 2020 **Simulation Adviser, SolMem LLC**
Multi-effect nanophotonic solar membrane distillation module simulation

April, 2020 **HWTS Newsletter contributor**
The Water Institute at UNC in collaboration with WHO & UNICEF

2020-present **Career Mentor, NSF ERC NEWT students/postdocs**
NEWT career development workshop (February 21, 2020)

2019-present **Task Group Member, NSF International - DWTU Joint Committee (JC)**
NSF/ANSI 53 – High Lead
NSF/ANSI 53 – PFAS
NSF/ANSI/CAN 61 – Nanomaterial
NSF/ANSI 53 – 1,2,3-TCP
NSF P-244

2019-present **Task Force Team, Water Quality Research Foundation (WQRF)**
2020 Project: Safe Drinking Water Act (SDWA) Compliance
2019 Project: Emerging contaminant removal and microbial growth in membrane filtration and activated carbon point-of-use system.
2018 Project: Contaminant Level Occurrence (Mapping tool): Completed.
2018 Project: Predictive modeling of US drinking water emergencies study.

2018-2019 **Vice President, Student Leadership Council (SLC), NEWT Research Center**

2018-2019 **Treasurer, American Water Works (AWWA) Rice Chapter**

2018-2019 **Vice President, Korean Graduate Student Association, Rice University**

2018-2019 **RICE STEM Outreach: Nano-In-Schools**
Taught science classes at local High Schools in Alief ISD in TX

2017-2018 **Harvey effect monitoring team, water/soil sampling & monitoring, Rice University**
Volunteered in analyzing pH, alkalinity, turbidity, and heavy metals
http://news.rice.edu/2017/09/11/rice-teams-collect-floodwater-for-study/
USA Today/news/nation/2017/09/04/rice-university-students-test-water-e.-coli/105272534/
http://news.rice.edu/2018/04/25/harvey-registry-latest-tool-in-hurricane-recovery-effort/
YOUTUBE/watch?v=LfdphNg-n5w
https://engineering.rice.edu/news/nsf-backs-'rapid'-study-harvey's-environmental-wake

2017-2018 **Professional development leader, Student Leadership Council (SLC), NEWT Center**

2016-2016 **Public health-related drinking water quality analysis – a collaboration with KHOU 11**
KHOU11 news station reported on live breaking news. (November 10, 2016)
http://www.khou.com/article/mobile/news/high-lead-levels-found-in-water-inside-city-buildings/350946843
https://www.khou.com/article/news/high-lead-levels-found-in-water-inside-city-buildings/350946843

2015-2019 **NSF Research Experience for High School Teachers/Students (REHST/REHSS) and for Community College Undergraduates (REU), Rice University**
Provide guidelines for a short-term water treatment project as a research mentor
Mentee: Ji Won Kim (Rice University), 2018 Fall
Mentee: Elisabeth Villarreal (Lee College), 2018 Summer
Mentee: Daniel S. Caña (Lone Star College), 2017 Summer
Mentee: Yunong Wang (Toyota Technological Institute), 2016 Fall.
Mentee: Jerry Cortez (Houston Academy of International Studies), 2016

Programming/software Skills

COMSOL, MATLAB, AutoCAD, Visual MINTEQ, C, ArcGIS, ETDOT (ADesignS, StePP).

Selected Patents

US 62/715116, Electrodes for selective removal of multivalent ions through capacitive deionization

US 9422168, EP 14165628, KR 102014004909, Dissolved Air Flotation Device for Liquid Clarification

WO 2013055163, PCT/KR2012008338, KR 1020110105512, Plates for measuring zeta-potential of non-planar material and method for measurement thereof

KR 1020090096353, Water purifier and its controlling method (Korean Patent)

KR 1020080112899, Water purifying filter element using iron oxide nanoparticles and method thereof (KP)

KR 100784167, Alumina-supported iron oxide nanoparticles for the advanced oxidation process (KP)

Selected Publications & Proceedings

Google Scholar Link

1. Eva Gil, Xiaochuan Huang; Kuichang Zuo, Jun Kim, Susana Rincón, Kiarash Ranjbari, François Perreault, Pedro J. J. Alvarez, Alejandro Zepeda, Qilin Li, A polysulfone/cobalt-metal organic framework nanocomposite membrane with enhanced water permeability and fouling resistance, Water Research 2021 (submitted).
2. Jun Kim, Amanda Morgott, Ziqi Wu, Liane Hopaluk, Michael Miles, William Stoner, Qilin Li, 3D Filter Product Modeling for Emerging Contaminants, WQA Convention & Exhibition 2021, Las Vegas. WQA Convention 2021 Technical Sessions **– The most viewed session in 2021.**
3. Ziqi Wu, Himel Barua, Jolanta R. Rylski, Joshua B. Taylor, and Jun Kim, A multiple regression model framework for designing a UVC LED reactor for point-of-use water treatment, Environmental Science: Water Research & Technology, 2021, 7, 1516-1529. https://pubs.rsc.org/en/content/articlelanding/2021/ew/d1ew00215e#!divAbstract
4. Jun Kim, Amanda Morgott, Ziqi Wu, Amy Puroll, Michael Miles, William Stoner, Qilin Li, Equation-based Adsorption Modeling for Aqueous Inorganic Species in Cylindrical Porous Media, COMSOL North America 2020. https://www.comsol.com/paper/equation-based-adsorption-modeling-for-aqueous-inorganic-species-in-cylindrical--92281
5. Zuo, Kuichang; Huang, Xiaochuan; Liu, Xingchen; Gil, Eva; Kim, Jun; Jain, Amit; Chen, Long; Liang, Peng; Zepeda, Alejandro; Verduzco, Rafael; Lou, Jun; Li, Qilin, A Hybrid Metal-Organic Framework-Reduced Graphene Oxide Nanomaterial for Selective Removal of Chromate from Water in an Electrochemical Process, Environmental Science & Technology, 54 (20), 13322-13332 (2020). https://doi.org/10.1021/acs.est.0c04703
6. Jun Kim, Ion-transport Theory, Electrosorption Mechanism, and Application of Capacitive Deionization, Rice University, 2020. https://scholarship.rice.edu/handle/1911/107966
7. Z Wu, J Rylski, J Taylor, D Schlenk, L Hopaluk, J Kim, Multiphysics Modeling of UV-C LED Reactor Design for Point-Of-Use Drinking Water Disinfection, IUVA, Orlando, FL, 2020.
8. Jun Kim, Amanda Morgott, Ziqi Wu, Liane Hopaluk, Michael Miles, William Stoner, Qilin Li, Simulating Transport and Adsorption of organic contaminants in 3D Porous Activated Carbon Block Media, COMSOL 2019 Boston, MA. https://doi.org/10.25611/fmxp-ff31 – **Best Paper Awards**
9. Jun Kim, Amit Jain, Kuichang Zuo, Rafael Verduzco, Qilin Li, Selective Removal of Calcium Ions from Water Using Target-ion Specific Capacitive Deionization, Water Research, 160, 445-453 (2019). https://doi.org/10.1016/j.watres.2019.05.016
10. Stephanie Loeb, Jun Kim, Chenxi Jiang, Lawrence Early, Haoran Wei, Qilin Li, Jae-Hong Kim, Nanoparticle Enhanced Interfacial Solar Photothermal Water Disinfection Demonstrated in 3-D Printed

Flow-Through Reactors, Environmental Science & Technology, 53, 13, 7621-7631 (2019). https://doi.org/10.1021/acs.est.9b01142

11. Amit Jain, Cierra Weathers, Jun Kim, Matthew D. Meyer, Shane Walker, Qilin Li, Rafael Verduzco, Self-Assembled, Sulfonated Pentablock Copolymer Cation Exchange Coatings for Membrane Capacitive Deionization, Molecular Systems Design & Engineering, 4, 348-356 (2019). https://doi.org/10.1039/C8ME00115D
12. A Jain, J Kim, K Zuo, I Said, S Walker, Q Li, R Verduzco, Functionalized and self-assembled ion exchange coatings for capacitive deionization, abstracts of papers of the American Chemical Society 257, 2019.
13. Jun Kim, Amit Jain, Kuichang Zuo, Rafael Verduzco, Qilin Li, abstracts of papers of the American Chemical Society, 2018. – **Certificate of Merit**
14. J Kim, A Jain, K Zuo, R Verduzco, Q Li, Texas Water 2018 WEAT/AWWA annual meeting, San Antonio, TX, 2018. – **Best Paper Scholarship**
15. Kuichang Zuo, Jun Kim, Amit Jain, Tianxiao Wang, Rafael Verduzco, Qilin Li, Novel Composite Electrodes for Selective Removal of Sulfate by the Capacitive Deionization Process, Environmental Science & Technology, 52 (16), pp 9486–9494 (2018). https://doi.org/10.1021/acs.est.8b01868
16. Amit Jain, Jun Kim, Kuichang Zuo, Qilin Li, Rafael Verduzco, Aqueous-Processed, High-Capacity Electrodes for Membrane Capacitive Deionization, Environmental Science & Technology. 52 (10), pp 5859–5867 (2018). https://doi.org/10.1021/acs.est.7b05874
17. O Oluwaseye, W Walker, A Jain, J Kim, Q Li, R Verduzco, RC circuit modeling of desalination performance of multicell membrane capacitive deionization (MCDI) systems for desalination of brackish water, abstracts of papers of the American Chemical Society 256, 2018.
18. A Jain, J Kim, K Zuo, Q Li, R Verduzco, Ion-selective and high capacity electrodes for membrane capacitive deionization, abstracts of papers of the American Chemical Society 255, 2018.
19. K Zuo, J Kim, A Jain, T Wang, R Verduzco, Q Li, Resin-modified capacitive deionization for selective uptake and removal of sulfate, Ion-selective and high capacity electrodes for membrane capacitive deionization, abstracts of papers of the American Chemical Society 256, 2018.
20. Jun Kim, Amy Heldenbrand, Qilin Li, A volumetric electrosorption equilibrium model in porous carbon for capacitive deionization, CDI&E, Seoul, S. Korea, 2017.
21. Amit Jain, Jun Kim, Qilin Li, Rafael Verduzco, Ion Exchange Polymeric Coatings for Selective Capacitive Deionization, Bulletin of the American Physical Society 62, 2017. https://meetings.aps.org/Meeting/MAR17/Session/S6.2
22. O Monzon, Y Yang, J Kim, A Heldenbrand, Q Li, P Alvarez, Microbial fuel cell fed by Barnett Shale produced water: Power production by hypersaline autochthonous bacteria and coupling to a desalination unit, Biochemical Eng. Journal 117, 87-91 (2016). https://doi.org/10.1016/j.bej.2016.09.013
23. Qilin Li, Amy Heldenbrand, Jun Kim, New mechanistic and predictive model for ion adsorption equilibrium in capacitive deionization, ACS, Philadelphia, 2016.
24. J. Kim, L. H. Doan, and H. Roh, Pilot Studies for the Reuse of NF Brines using High Recovery RO, IWA - Water Reuse and Energy, Daegu, S. Korea, 2014.
25. J. Kim, L. H. Doan, and H. Roh, New Approach to Evaluate the Performance of High Loading rate Dissolved Air Flotation in Seawater, AMTA, Las Vegas, NV, 2014.

26. Jun Kim, Lan Huong Doan, and Hyung Keun Roh, Innovative Flow Analysis Method for High Loading Rate DAF, International Desalination Association – Desalination & Water Reuse, Vol. 24, pp. 42-47 (2014). https://www.desalination.biz/news/3/Innovative-Flow-Analysis-Method-for-High-Loading-Rate-DAF/7706/

27. Jun Kim, Hosik Park, Haeryong Jung, JungkwonSeo, and Heechul Choi, Iron Oxide Nanoparticle-Impregnated Alumina for Catalytic Ozonation of para-Chlorobenzoic Acid in Aqueous Solution, Water, Air, & Soil Pollution, 225:1975 (2014). https://doi.org/10.1007/s11270-014-1975-0

28. J Kim, P Mane, L Doan, HK Roh, Effect of Saturator Pressure on Micro-bubble Properties and Implications on Full-scale DAF System Operation, International Desalination Association 2013 Tianjin (2013).

29. P Mane, S Wang, LH Doan, J Kim, HK Roh, Pilot Testing of Second Stage RO for Cost-Effective Brine Volume Minimization in ZLD Processes, AMTA/AWWA Membrane Technology Conference & Exposition (2013).

30. P Mane, L Doan, S Wang, J Kim, HK Roh, Pilot-Scale Evaluation of Integrated Lime Softening and Ultrafiltration for NF Softening Concentrate Reuse, Water Quality Technology Conference and Exposition (2012).

31. Haeryong Jung, Hosik Park, Jun Kim, Ji-Hoon Lee, Hor-Gil Hur, Nosang V Myung, Heechul Choi, Preparation of biotic and abiotic iron oxide nanoparticles (IOnPs) and their properties and applications in heterogeneous catalytic oxidation, Environmental science & technology, 41, 13, 4741–4747 (2007), https://doi.org/10.1021/es0702768

MARY B. VOLLARO, Ph.D.

mvollaro@flpoly.org **863.874.8604**

EDUCATION

Ph.D. in Materials Science, Field of Metallurgy, May 1996
UNIVERSITY OF CONNECTICUT, Storrs, CT
Dissertation: Phase Formation, Microstructures, and Electrical Properties of Ni-Cr Films
Advisor: Dr. Donald I. Potter

M.S. in Metallurgy, 1986
RENSSELAER POLYTECHNIC INSTITUTE
The Hartford Graduate Center, Hartford, CT

B.S. in Mechanical Engineering, 1983
WESTERN NEW ENGLAND COLLEGE, Springfield, MA

PROFESSIONAL EXPERIENCE

Associate Professor, Mechanical & Industrial Engineering Aug '16 - present
FLORIDA POLYTECHNIC UNIVERSITY, Lakeland, FL

Associate Professor, Mechanical Engineering Aug '04- May '16
Assistant Professor, Mechanical Engineering Sept '98 – Aug '04
Assistant Professor of Engineering (Visiting) Sept '97 –Aug '98
WESTERN NEW ENGLAND UNIVERSITY, Springfield, MA

Assistant Professor (adjunct) Summer '97
FAIRFIELD UNIVERSITY, BEI School of Engineering, Fairfield, CT

Research Scientist Feb '96 – Aug '97
ADVANCED TECHNOLOGY MATERIALS, INC., Danbury, CT

Graduate Research Assistant / Teaching Assistant June '89 –Apr '96
UNIVERSITY OF CONNECTICUT, Storrs, CT

Manufacturing Engineer / Process Planner July '86 – Aug '88
PRATT AND WHITNEY AIRCRAFT, North Haven, CT

Materials Engineer I June '83– July '86
AVCO LYCOMING, Stratford, CT

PUBLICATIONS

Vollaro, M.B. , Klein, R.R. , *"Completing the pass: Leadership 'on' and 'in' the field",* Proceedings of the 2016 ASEE Annual National Conference

Waters, C. , Krause, S., Weeks, P., **Vollaro, M.B.,** Dupen, B., and Callahan, J., "*Revealing Student Misconceptions and Instructor Blind Spots with Muddiest Point Formative Feedback*", Proceedings of 2016 ASEE Annual National Conference

Vollaro, M.B. , Klein, R.R. , *"Training for Leadership and Team Skills from Freshman Year Forward",* Proceedings of the 2015 ASEE Annual National Conference

Vollaro, Mary B., and Brennan, Michael, *"Leveraging student's interests in a senior design project through integration of materials selection methodology",* Proceedings of the 2014 ASEE National Conference

Dr. Owe G. Petersen (Milwaukee School of Engineering), Dr. R. David Kent (Milwaukee School of Engineering), Dr. Christina Howe (University of Evansville), and **Dr. Mary B. Vollaro (Western New England University), "***General Education: Key for Success for an Entrepreneurial Engineering Career"***,** Proceedings of the 2012 ASEE National Conference

Vollaro, M.B., "*Information Literacy as part of the Materials Science Course"*, Proceedings of the 2011 ASEE Annual Conference, Proceedings of the 2011 ASEE Annual National Conference

Vollaro, M.B., "*Student Perception of a Series of Activities in a Manufacturing Processes Course",* Proceedings of the 2009 ASEE Annual National Conference

Vollaro, M.B., "*Materials Selection Exercises based on Current Events",* Proceedings of the 2007 ASEE Annual National Conference

Vollaro, M.B., "*Engineering Exploration for Junior Girls Scouts: Partnership, Activities, Insight, and Reflection",* Proceedings of the 2006 ASEE Annual National Conference

Vollaro, M.B., "*More than Science Fair Fun*: *Poster Session as an Experiential Learning Activity in the Classroom",* Proceedings of the 2005 ASEE Annual National Conference

Mary B. Vollaro and Craig Johnson (Central Washington University), "*Materials Education 2004 Topical Trends and Outreach Effort*", Proceedings of the 2004 ASEE Annual Conference.

Vollaro, M.B.," *The Classroom is our Lattice": A Series of "Quick" Visualization Exercises for the Introductory Materials Science Course* ", Proceedings of the 18th Annual National Educators Workshop (NEW), Experiments in Engineering, Materials, Science and Technology, October 2004.

Musiak, R., Schreiner, S., **Vollaro, M.,** Lipkens, B., Haffner, E., Grabiec, R., "*The Total Learning Environment of our Freshman Engineering Students*", Proceedings of 2003 ASEE Annual Conference

Mindek, Jr., R.B., Keyser, T.K., Musiak, R.E., Schreiner, S., **Vollaro, M.B.,** "*Integration of Engineering Ethics Into The Curriculum: Student Performance and Feedback*", Proceedings of 2003 ASEE Annual Conference

Vollaro, M.B., "*Field Trips: An innovative approach in teaching 'Manufacturing Processes' to traditional undergraduates"*, Proceedings of 2002 ASEE Annual Conference

Schreiner,S., Keyser, T., Musiak,R., Mindek, R., **Vollaro,M.,** "*Strategic use of Manhattan: An Internet communication tool used with a freshmen engineering design course*", Proceedings of 2002 ASEE Annual Conference

Vollaro, M.B., "*Poster Sessions: A Learner-Centered Activity and Assessment Tool for Engineering Students",* Proceedings of the 2002 American Society for Engineering Education Zone 1 Conference

Park, Holly., Skutnik, Bolesh J., and **Vollaro, Mary B.,** "*Prototype for Numerical Aperture Tester for Step-Index Multimode Specialty Medical Optical Fiber*", Proceedings of the IEEE 28th Annual Northeast Bioengineering Conference

Musiak, R.E., Haffner, E.W., Schreiner, S., Karplus, A.K., **Vollaro, M.B**., Grabiec, R.A., "*Forging New Links: Integrating the Freshman Engineering Curriculum*", Proceedings of the 2001 ASEE Annual Conference

Vollaro, M.B. and Potter, D. I., "*Phase Formation in Coevaporated Ni-Cr Thin Films*", *Thin Solid Films*, 239 (1994) 37-46.

Vollaro, M.B. and Miller, J.A., "*Quality and Inspection of Brazed Joints*", American Society of Metals (ASM) Handbook, Vol. 6, Welding, Brazing and Soldering, 1993, American Society of Metals (ASM), 1117-1123.

Vollaro, M.B. and Miller, J.A., "*Inspection of Brazed Joints*", Brazing Handbook Fourth Edition, 1991, American Welding Society (AWS), 259-266.

PRESENTATIONS

Vollaro, M.B. , and Klein, R.R. , *"Training for Leadership and Team Skills from Freshman Year Forward"*, 2015 ASEE Annual Conference, Leadership (LEAD) Division, Seattle, WA, June 16, 2015

Vollaro, M.B., "*A model for senior design projects = Student's personal interests + Materials Selectin Methodology*", at the 6th North American Materials Education Symposium, March 25-27, 2015, at The Ohio State University, Columbus, OH

Vollaro, Mary B., and Brennan, Michael, *"Leveraging student's interests in a senior design project through integration of materials selection methodology",* 2014 ASEE National Conference, Indianapolis, IN, June 16, 2014

Vollaro, M.B., and Klein, R.R., "*Training in teaming and leadership from 'start to finish' in school and beyond….* ", Poster presentation, at KEEN 2013 Winter Meeting, January 3-4, 2013 in Tempe, AZ and at poster session of KEEN & ENT Division, June 25, 2013 at the ASEE 2013 Annual Conference in Atlanta, GA

Vollaro, M.B., "*Insights to Materials Selection from a Historical Perspective"*, conducted hands-on workshop, 2011 National Educators Workshop (NEW), October 16-18, 2011 in Greensboro, North Carolina

Vollaro, M.B., "*Information Literacy as part of the Materials Science Course"*, 2011 ASEE Annual Conference, 2011 ASEE Annual Conference in Vancouver, BC, Canada.

Vollaro, M.B., "*Improving the Technical Reporting Ability of Undergraduate Engineering Students: Common language description to handbook properties of materials",* 2nd North American Materials Symposium, March 2011 at Worcester Polytechnic Institute, Worcester, MA.

Vollaro, M.B., "*Student Perception of a Series of Activities in a Manufacturing Processes Course",* 2009 ASEE Annual Conference in Austin, TX, and 22nd Annual National Educators Workshop in Lynwood, WA, October 2007.

Vollaro, M.B., "*Materials Selection Exercises based on Current Events",* 2007 ASEE Annual Conference, Honolulu, HI, 21st Annual National Educators Workshop, 2006

Vollaro, M.B., "*Engineering Exploration for Junior Girls Scouts: Partnership, Activities, Insight, and Reflection",* 2006 ASEE Annual Conference, 2006 Annual Conference, Chicago, Illinois, and 20th Annual National Educators Workshop, Gaithersburg, MD, 2005

Vollaro, M.B., "*More than Science Fair Fun*: *Poster Session as an Experiential Learning Activity in the Classroom",* 2005 ASEE Annual Conference and 19th Annual National Educators Workshop, Phoenix, AZ, 2004.

Mary B. Vollaro and Craig Johnson (Central Washington University) *Materials Education 2004 Topical Trends and Outreach Effort*, 2004 ASEE Annual Conference, Salt Lake City, UT

Vollaro, M.B.," *The Classroom is our Lattice": A Series of "Quick" Visualization Exercises for the Introductory Materials Science Course* " 18th Annual National Educators Workshop, Experiments in Engineering, Materials, Science and Technology, Hampton, VA, October 2004

Musiak, R., **Schreiner, S.,** Vollaro, M., Lipkens, B., Haffner, E., Grabiec, R., "*The Total Learning Environment of our Freshman Engineering Students*", 2003 ASEE Annual Conference in Nashville, Tennessee, June 24, 2003.

Mindek, Jr., R.B., **Keyser, T.K.,** Musiak, R.E., Schreiner, S., Vollaro, M.B., "*Integration of Engineering Ethics Into The Curriculum: Student Performance and Feedback*", Proceedings of 2003 ASEE Annual Conference in Nashville, Tennessee, June 24, 2003.

Vollaro, M.B., "*Engineering Exploration for Junior Girls Scouts: Establishing a partnership and implementing a hands-on activity*", ASEE Zone 1 Conference, University of Maine, Orono, ME, May 1, 2003

Vollaro, M.B., "*Experiences using Manhattan: A personal perspective*", 2003 Wellen Davidson Seminar at Western New England College, Springfield, MA. , January 9, 2003

Vollaro, M.B., *"Field Trips: An innovative approach in teaching 'Manufacturing Processes' to traditional undergraduates",* 2002 ASEE Annual Conference, June 16-20, 2002 in Montreal, Canada.

Schreiner,S., Keyser, T., Musiak,R., Mindek, R., Vollaro,M., *"Strategic use of Manhattan: An Internet communication tool used with a freshmen engineering design course",* 2002 ASEE Annual Conference, June 16-20, 2002 in Montreal, Canada.

Bronson, C., and Vollaro, M.B*., "Assessment though our Roots: Transforming a Course Assignment in to a Course Embedded Assessment Tool",* 2002 American Association for Higher Education (AAHE) Assessment Conference, Boston, MA

Vollaro, M.B., "*Poster Sessions: A Learner-Centered Activity and Assessment Tool for Engineering Students",* 2002 American Society for Engineering Education Zone 1 Conference, April 5-6, 2002, United States Military Academy, West Point, NY

Presented workshop with ENGR103 team members, "*Workshop: Introduction of the Design Process to Freshman Engineering Students*" at the 2002 American Society for Engineering Education Zone 1 Conference, April 5 – 6, 2002 at the United States Military Academy, West Point, NY

Park, Holly., Skutnik, Bolesh J., and Vollaro, Mary B., *"Prototype for Numerical Aperture Tester for Step-Index Multimode Specialty Medical Optical Fiber*", IEEE 28th Annual Northeast Bioengineering Conference, April 20-22, 2002 at Drexel University, Philadelphia, PA

Vollaro, M.B., "*Poster Sessions: A Learner-Centered Activity and Assessment Tool for Engineering*", Development Series 2002-03 Enhancing Teaching and Learning at WNEC at Western New England College, Springfield, MA, December 4, 2002

Musiak, R.E., Haffner, E.W., **Schreiner, S**., Karplus, A.K., Vollaro, M.B., Grabiec, R.A., *"Forging New Links: Integrating the Freshman Engineering Curriculum*", 2001 ASEE Annual Conference, Albuquerque, NM, June 24-27, 2001.

Vollaro, M.B., Second Annual WNEC Engineering Symposium, "*Hands-on with a Scanning Electron Microscope*", Western New England College, May 20, 1999

Vollaro, M.B., First Annual WNEC Engineering Symposium, "*Review of Technology for Materials Characterization*", Western New England College, May 13, 1998

Vollaro, M.B., and Potter, D.I., "*Electrical Properties and Microstructure of Ni-Cr Thin Films*", Poster, Materials Research Society (MRS) 1996 Fall Meeting, December 2-6, 1996, Boston, MA

PROFESSIONAL DEVELOPMENT

Attended workshop, *Engineering Leadership Lab Demonstration*, at 2015 ASEE Annual Conference in Seattle, WA on June 14, 2015

Attended workshop, *Web-Enabled Tools and Resources for More Effective Teaching and Learning*, at ASEE Annual Conference in Indianapolis, IN, on June 15, 2014

Attended workshop, *Fast Formative Feedback to Enhance Learning and Motivation*, at 2013 ASEE Annual Conference in Atlanta, GA on June 23, 2013

Activities in support Kern Entrepreneurship Education Network (KEEN):

SEE Faculty Workshop, *"Shaping Entrepreneurial Engineers Faculty Workshop"* sponsored by KEEN network on best practices, January 5, 2013 in Tempe, AZ

Winter Meeting in Tempe, AZ on January 3-5, 2013

SCAN Meeting for KEEN group, Villanova University in November 16, 2012

KEEN Fall meeting in Milwaukee, WI on September 28-29, 2012

Pre-meeting workshop on KEEN Student Outcomes (KSO) rubrics for outcomes 1, 2 and 4, Milwaukee, WI on September 27, 2012

Meeting of SCAN Group at Union College in Schenectady, NY on June 1, 2012

KEEN Assessment Workshop and Meeting in Milwaukee, WI on April 18-20, 2012

SEE Workshop and Winter Meeting in Orlando, FL on January 3-6, 2012

KEEN Workshop and meeting in Milwaukee, WI on September 28-30, 2011

Attended (on scholarship), the Olin I2E2 faculty workshop, *Meeting the Needs of the 21st Century: Designing for Student Engagement*, at Franklin W. Olin College of Engineering in Needham, MA on June 13-17, 2011

Attended workshop, *Integrating Sustainability into Engineering: Design Principles and Tools to Expand Educative Capacity*, at ASEE 2010 National Conference in Louisville, KY in June 2010

Attended symposium, *Information Technology in Support of Materials Education*, at Stevens Institute of Technology, March 20, 2010

Participation with students, *2009 WERC International Environmental Design Contest on the task of "Wind-2-H2O: Converting Wind Energy to Mechanical Energy for Water Treatment*" at New Mexico State University in Las Cruces, MN

Attended workshop, *Web-based Assessment of Capstone Engineering Design*, ASEE 2009 National Conference in Austin, TX, June 2009

Attended workshop, *Case Studies in Engineering Education,* ASEE 2007 National Conference in Honolulu, HI, June 2007

Attended short course, *New Approaches in Materials Education; CES Edupack 2006* presented by Prof. Mike Ashby from Cambridge University, held in Chicago, IL, June 2006

Attended one-week course (NFS Grant funded), *Nanoscale Mechanical Characterization: The Theory and Practice of Contact Probe Techniques*, held Northwestern University, Evanston, IL, on Aug. 11-15, 2003

Attended short course, *New Approaches in Materials and Manufacturing Education; CES 4.0 Material Selector*, presented by Prof. Mike Ashby from Cambridge University, held in Nashville, TN, June 22, 2003

Attended 3-day teaching workshop, *Teaching Engineering Faculty to Teach in an Active Learning Environment*, Roger Williams University, August 13-15, 2001

Attended workshop, *Instruction on the use of Lego-Dacta kits and ROBOLAB software for age appropriate engineering experiences for grades K-12*, Tufts University, May 23, 2001

GRANTS AWARDED

September 2011, Kern Entrepreneurship Education Network (KEEN), Phase 1, Kern Family Foundation, $75,000

Summer 2011, Scholarship for the Olin I2E2 faculty workshop, *Meeting the Needs of the 21st Century: Designing for Student Engagement*, at Franklin W. Olin College of Engineering in Needham, MA (Awarded $2000 scholarship to participate in this week-long event attended by engineering faculty from around the world, e.g., mainland China, Peru, Singapore, England, Saudi Arabia, and more.)

Summer 2010, WNEC School of Engineering Summer Development Grant- Write proposal for WNEC's participation in the Grand Challenges Scholars Program sponsored by NAE (National Academy of Engineers), $1000

2009-10, Clean Energy Workforce Training Capacity Building Grant Program, Development in Life Cycle Analysis Course, $3500

Summer 2008, WNEC Curriculum Development Grant for ENGR105 course redesign, $500

2008-09, Center for the Advancement of Scholarship on Engineering Education, National Academy of Engineering to improve recruitment and retention of female students in mechanical engineering. $2400

Summer 2005, Curriculum grant for development of new ENGR105- freshman engineering course for applications and computer programming design using MATLAB, $1000

Summer 2003, National Science Foundation (NSF) Fellowship, Summer Institute on Nano Mechanics and Materials, at Northwestern University, Evanston, IL, on August 11-15, 2003

2001-2003, Awarded a position in 3-year grant funded by Engineering Information Foundation, "Leadership Skills and Community-Building Workshop for Women Junior Faculty in Engineering", Outward Bound Professional program at Hurricane Island, ME (August 2001), "Writing and Community Building Workshop" in Vergennes, VT (August 2002) and "Strategic Career Planning for Women in Engineering" in Northampton, MA (August 2003).

2001 SME Library Award, Society of Manufacturing Engineers (SME) Education Foundation, Materials to upgrade manufacturing library, $2252

March 2001, Western New England College Faculty Professional Development Grant, "Additional course development for ENGR103 Introduction to Engineering", $2000

Summer 1998, Western New England College Faculty Professional Development Grant, "The Development of a Training Manual and Maintenance Program for the Scanning Electron Microscope", $1000

SPECIAL ASSIGNMENTS (at Western New England University)

2012-2016, Program Coordinator College of Engineering Honors Program, and **Chair** of College of Engineering Honors Program Committee**.** Developed hybrid model with cohort and honors-by-contract courses to meet the needs of the College of Engineering Honors students

2011-2013, KEEN PI and WNE Coordinator, **PI and Coordinator** for KEEN grant

2011-2013, Program Designer and Coordinator, WNE College of Engineering Grand Challenges Scholars Program sponsored by NAE (National Academy of Engineers)

2012-2013, Coordinator, WNE College of Engineering Study Abroad initiatives with HEI in Universite Catholique De Lille in Lille, France

COURSES TAUGHT (at Western New England University)

ME309 *Materials Science*, 3 credits, Undergraduate

EE312 *Electrical Materials and Devices*, 3 credits, Undergraduate

BME340 *Introduction to Biomaterials*, 3 credits, Undergraduate

ME208 *Mechanics of Materials,* 3 credits, Undergraduate

ME322 (previously **IE314**) *Manufacturing Processes*, 3 credits, Undergraduate

ENGR103 *Introduction to Engineering*; 4 credits, Freshmen

ENGR102 *First Year Engineering Seminar*, 1 credit, Required, Freshmen

HONE 102 *Honors First Year Engineering Seminar*, 1 credit, Freshmen

ENGR 100 *Engineering Seminar & College Success Skills*, 2 credits, Freshmen

ENGR 105 (ENGR110) *Computer Applications in Engineering*, 2(3) credits), Freshmen

ME313 *ME Laboratory I*, Undergraduate (Jr.) –Strain gauges & cantilever beam

ME314 *ME Laboratory II*, Undergraduate (Jr.) - Cold work & recrystallization of cartridge brass

IE318 *IE Design Lab I*, Undergraduate (Jr.) , **IE428** *IE Design Lab III*, Undergraduate (Sr.)

ME 412 *Green Engineering: Materials Selection in the Life Cycle Design Process*, 3 credits, Upper level undergraduate

ME 480 *Internship for Mechanical Engineering*, 3 credits

EMGT 590 and EMGT690 – *Special Topics in Engineering Management: Topics in Advanced Manufacturing Processes***,** Upper level undergraduate/ Graduate

ME640 *Materials Selection and Manufacturing Process,* 3 credits, Graduate

COURSE HIGHLIGHTS (from Western New England University)

Use of virtual classroom Kodiak (Desire2Learn software) – All courses presented on this platform and contain course materials. Report from WNE Information Technology indicated ENGR 102 First Year Seminar course utilized the most Kodiak features (7) of any course on campus.

The Annual Materials Science Poster Session – Students chose a topic, research the literature for information on 'properties, processing, and microstructure', create a poster, and present it in a symposium format.

Information Literacy for Materials Science – Workshop conducted in collaboration with our librarian in support of the ME309 project, i.e., poster and paper.

'Muddiest Points' student centered inquiry to facilitate student learning in Materials Science.

Interactive classroom in Manufacturing Processes, including hands-on activities, videos with guided reflection, 'video' exams, and student presentations.

Assignments utilizing the CES Edupack Materials Selection software (Granta Design) in Materials Science and Manufacturing Processes.

Exemplar assignments in ENGR 102 First Year Seminiar for assessment of university-wide competencies in information literacy and professional development for the WNE First Year Program.

Course management in ENGR 102 First Year Engineering Seminiar with 160-180 freshman students and 18 FSA's (Freshman Seminiar Assistant), who conduct lessons and activities in 'breakout rooms' for their group of 20-25 students prior to meeting as a large group.

Leadership and teamwork skills in ENGR 102 First Year Engineering Seminiar utilizing assessment instruments, MBTI (Myers-Briggs Type Indicator) and new KGI (Klein Group Instrument), and students are 'trained' in workshops and with guided reflection.

Industry tours in Manufacturing Processes- The required industrial tours coincided with the manufacturing processes being studied in class and a guided reflection activity was required. *Tours included*: • Yankee Casting Co., Inc. / Yankee Magcast Co. in Enfield, CT
• Techni-Products, Inc. in East Longmeadow, MA • Smith & Wesson, Inc. in Springfield, MA
• O-A, Inc. in Agawam, MA, • American Saw & Manufacturing, Co. in East Longmeadow, MA
• A.G. Miller, Inc. in Springfield, MA • Hamilton Sundstrand in Windsor Locks, CT
• Columbia Manufacturing, Inc., in Westfield, MA

ADVISING (at Western New England University)

Academic advisor to 20-30 students per year; 1997-2011 for freshman engineering students, and 2012 – present for Mechanical Engineering students in sophomore, junior, and senior years.

FACULTY SUPPORT ACTIVITIES (at Western New England University)

Coordinate the **Alumni Mentoring Program** (AMP) with College of Engineering and Alumni Office.

Sponsored many **Learning Beyond the Classroom (LBC) experiences** and **reviewed** papers for more than 20 students per year.

Support recruitment and retention efforts by conducting **tours and interviews** for prospective students, making **recruiting calls** (50+ calls per year to prospective ME and ENGR students)

Wrote numerous **Letters of Recommendation** for student's at all academic levels, ongoing

Participate in **department efforts** to hire new faculty, ABET, student recognition events, and program improvements, ongoing

Participate **Convocation** (Marshall), Academic Awards events (presenter), **Commencement** (platform party and assisting with diplomas)

Faculty representative, Western New England University Open House for prospective students, 1997 - present

Instructor and Faculty Advisor, SOAR (Summer Orientation and Registration) program: First Class in Engineering, Faculty Expectations Panel, Advising and Registration, 1997 - present

PROFESSIONAL SERVICE

Leadership positions, Materials Division, American Society For Engineering Education (ASEE) Materials Division, Immediate-Past Division Chair (2008-09), National **Division Chair** (2006-07), **Program Chair** (2004-05)

Peer Reviewer, Materials Division, ASEE Annual Conference, 2003- present

Session Chair, Materials Division, ASEE Annual Conference numerous times, 2003-present

Peer Reviewer, Leadership (LEAD) Division**,** ASEE Annual Conference, 2015-16

Member, Organizing Committee, National Educators Workshop for Materials Education (NEW), 2005- 09, **Session chair, peer reviewer** NEW at numerous times, 2002-2009

Member, Review Panel, National Science Foundation, for proposals submitted to the Division of Undergraduate Education (CSEMS), Washington, D.C., November 1999.

UNIVERSITY-WIDE GOVERANCE (at Western New England University)

Member, University Senate Athletics and Recreation Committee, 2015- present

Member, Academic Standards Committee of the Faculty Council, 2011-present

Chair of Western New England University Faculty Senate, 2012-13

Chair of Nominations and Rules Committee, University Faculty Senate, 2012-13

Member of General University Requirements (GUR) Committee 2012-15; **Chair** 2013-15

Senator, Western New England University Faculty Senate**,** 2012-14

Member of University-wide Ad Hoc Committee on General Education Requirements, 2011-14

Member of General College Requirements Committee 2007-11; **Chair** 2008-09

Chair of Western New England College Faculty Senate, 2006-07

Vice-Chair of Western New England College Faculty Senate, 2005-06

Senator, Western New England College Faculty Senate, 2 terms (2005-07 and 2007-2009)

Member of college wide committee for 2011 NEASC Accreditation Committee, **Chair** of NEASC Standard #11, Integrity

Member of Academic Standards Committee 2007-11; **Chair** 2007-08, 2008-09

Member of college-wide Strategic Planning Committee 2008 thru Fall 2009, **Chair** of Sub-committee for Sustainability

Member of college-wide 2001 NEASC Accreditation Committee; **Member** of NEASC Integrity Committee

Member of Lecture Day Committee, 1998-1999

Member of Academic Standards Committee, 1997-98

Member of Search Committee for Provost/Vice President of Academic Affairs (Selected by President Caprio) 1997

COLLEGE OF ENGINEERING GOVERANCE (at Western New England)

Chair of Honors Committee, 2011- present

Member of Hall of Fame Committee, 2014-present

Chair of Peer Review Committee (PRC) for Promotion and Tenure, 2014-15

Member of Peer Review Committee (PRC) for Promotion and Tenure, 2013-14

Member of New Initiatives Committee, 2008-09

Member of Strategic Planning Committee, 1997-98

Member of Admissions/Retention Committee, 1997-98

Member of Curriculum Committee, 1997

Member of Retention and Outreach Committee, 1997

OUTREACH FOR STUDENTS AND THE COMMUNITY

2003 –2011, **Coordinator and presenter,** "Engineering Exploration for Junior Girl Scouts", Activity co-sponsored by WNEC and Girl Scouts of Pioneer Valley and attended each year by 20-50 Girl Scouts, hosted on the campus of Western New England.

Faculty representative, **Leadership School Science Fair Activity, Western New England College, May 29, 2003**

Instructor, "Exploring Engineering", Workshop for after school enrichment program, March Madness", at Somers Elementary School, Somers, CT, March 2001 and 2002

Instructor, "Introduce a Girl to Engineering Day", Outreach program and activities at Western New England College, Springfield, MA on February 22 and April 26, 2001

Faculty advisor, WNEC student chapter of the Society of Women Engineers (SWE),1997-2007
Highlights: Team Building and Networking through the Ropes Course Activities at Springfield College, Springfield, MA, October 19, 2002; SWE Alumni Dinner and Panel Discussion 2000-2003, Western New England College, Springfield, MA

Co-organizer, Faculty co-chair of the 3rd and 4th Annual Applied Engineering Symposium at Western New England College, May 2000 and 2001.

Session moderator, The Annual Engineering Symposium on May 22, 2002 at Western New England College, Springfield, MA.

FACULTY ADVISOR FOR SENIOR DESIGN PROJECTS / INTERNSHIPS

***Work done in the WNE College of Engineering laboratories unless otherwise noted.*

Spring 2016, "   "Robert Jenkins, *Industrial Sponsor:* American Eagle Cycles, Inc. Westfield, MA

Fall 2015, "Design and Analysis of a Hockey Stick: A Material Selection Project", Anthony Vincequere

Spring 2015 "Materials Science and Manufacturing: Process Design for Welding", Danyelle Bigda, *Poster Competition Winner**

Spring 2015 "Surface Characterization of Indium Tin Oxide Bioelectrodes", Stephen Faivre

Spring 2015 "Design and Analysis of the Quick-Release Mechanism for Facemasks of a Football Helmet; A Material Selection Project", Andrew Gatzogiannis

Spring 2015 "Material Science and Manufacturing: Design Process for Welding", Ryan Gazlay

Spring 2015 "Design Optimization of Heat Treatment", Joshua Rose, *Industrial Sponsor*: Yankee Casting Inc., Enfield, CT

Spring 2015 Design of an Exhibit to Demonstrate Engineering Principles in Rowing, Ryan Scott

Spring 2015 Fatigue Life Prediction of a Welded and Pressurized Aerospace Structure, Tom Sullivan, *Industrial Sponsor*: Design Automation Associates, Inc., Enfield, CT

Spring 2014, "Feasibility and Material Selection for an Electronic Turf Field", Ryan Flanigan

Spring 2014, "The Design and Feasibility Study of An Artificial Turf Field", Terry Crocker

Spring 2014, "Material Study and Performance Comparison of Baseball Bats", Ryan Skelly

Spring 2014, "Analysis of Materials in the Design Optimization of Fishing Rods", Kevin Wilkes

Spring 2013, "Unweldable or just difficult? A Comparison of TIG Welding Parameters on Precipitation Hardened Stainless Steel", Shane Haluch

Spring 2013, " Is it really a mystery? Analysis of Servo Pneumatic Valve Spool Corrosion". Kyle Pepin, *Industrial sponsor*: Enfield Technologies, Shelton, CT

Spring 2013 "Determination of Bend Point and Associated Attributes for Lenox Tools", Nicholas Wiltey, *Industrial sponsor*: Lenox Tools, East Longmeadow, MA

Spring 2013 “Analysis of Core Materials for the Design and Fabrication of an All Mountain Ski”, Michael Brennan

Spring 2013 “A Comparison of TIG Welding Joint Design with Aluminum”**,** Dillon Young *Poster award winner*

Spring 2012 *“*Why do I keep fixing the same old thing? A comparison of Two Welding Processes”, Andrew Scanlon

Spring 2012, “Materials and Product Design of a High Speed Shutter”, Matthew Allen, Work *Industrial sponsor:* Precision X-Ray, North Branford, CT

Spring 2012, “Effect of Coolant on Chips Produced by Milling”, Paul Dougan

Spring 2012, “A comparison of Welding Parameters for Two different Materials using the MIG Process”, Matthew J. Costopoulos

Spring 2011, “Created Equal? A comparison of three welding processes”, Travis Hatch

Spring 2011, “A Comparison of Welding Parameters for Three Different Materials Using MIG Process”, Ben Althen *Poster winner*

Spring 2011, “Re-design of the WNEC Freshman Design Project”, Adam Petrillo

Spring 2011, “Material Selection and Product Development”, Andrew Labrie

Spring 2009, “Wind-2-H2O: Design and Fabrication of a Water Treatment Device’, Brian Carrigan and Michael Massa WERC International Environmental Design Contest at University of New Mexico, Las Cruces, NM

Spring 2009, “Design and Implementation of an Improved Process for Tip Welding”, *Industrial Sponsor:* Newell Rubbermaid, Inc., Lenox, East Longmeadow, MA

Spring 2009, “Design and Implementation of an Improved Process for Flash Butt Welding”, *Industrial Sponsor:* Newell Rubbermaid, Inc., Lenox, East Longmeadow, MA

Spring 2007, “Design of an Exhibit on Welding Processes”, Christopher Orlando

Spring 2007, “Optimization of a Tungsten Source for NiCr Evaporation of a Microchannel Plate”, Francis Langevin, *Industrial Sponsor*: Burle Electro-Optics, Inc., Sturbridge, MA

Spring 2006, “Study of the Properties and Microstructure of Welding Super-Alloy Materials”, Jason Laforge, *Industrial Sponsor:* Barnes Aerospace, Windsor Airmotive Division, East Granby, CT

Spring 2006, “Design and Construction of a Thermoforming Machine to Test the Effect of Color on Plastics’, Lindsey Burns, *Industrial Sponsor:* Universal Plastics, Holyoke, MA

Spring 2005, “Design of a High Profile Heat Style for a Plastic Squeeze Tube”, Vincent Cross, *Industrial Sponsor:* Tubed Products, LLC, Easthampton, MA

Fall 2004, “Design, Development and Implementation of an Exhibit on Material Hardness”, Christopher Sparrer

2001-02 “Process Control and Modification of Leaded Glass Reduction Done Through a Hydrogen Furnace”, Megan Melch, *Industrial sponsor:* K and M Electronics, Inc., West Springfield, MA

2001-02 “Prototype for Numerical Aperture Tester for Step-Index Multimode Specialty Medical Optical Fibers”, Holly K. Park, *Industrial sponsor:* CeramOptec Industries, East Longmeadow, MA

2000-01 “Analysis and Characterization of an Ultraviolet Curing System”, Erica Landry, *Industrial sponsor*: Rexam Image Products, South Hadley, MA

2000-01 “Design and Implementation of a Highly Efficient Changeover System in the Ball Finishing Area”, Roland A. Lessard and Matthew D. Gidman, *Industrial sponsor:* Saint Gobain Advanced Ceramics East Granby, East Granby, CT

Spring 2001 “Materials Characterization Project” in fulfillment of the requirements of EMGT680 Engineering Management Independent Study, Roger Bemont, *Industrial sponsor:* Hamilton Sunstrand, Windsor Locks, CT

Fall 2000 “UV, VIS, and NIR Spectral Losses of High- and Low OH Optical Fibers for Medical Applications”, Holly Park, *Industrial internship*: CeramOptec, Inc., East Longmeadow, MA

1999-2000 “Design / Analysis of a Probability of Detection (POD) Curve Using Panel Validation”, Tyson Hatch, *Industrial sponsor:* Hamilton Sunstrand, Windsor Locks, CT

1998-99 “The Design and Fabrication of a Device that will Investigate the Effects of Bruxism on Teeth”, Co-advisor, Lino S. Italia

Spring 1998 “Improvements in Heat Treatment of B32 High Strength Steel”, Matthew Keane, *Industrial sponsor:* American Saw and Manufacturing, Inc., East Longmeadow, MA

Xiaofan Xu, Ph.D.

xxu@floridapoly.edu

Environmental Engineering Department | 5125 Palm Springs Blvd.
Florida Polytechnic University | Unit 10308
4700 Research Way | Tampa, FL 33647
Lakeland, FL 33805 | (813)570-3639

EMPLOYMENT

Florida Polytechnic University — Lakeland, FL

Assistant Professor, Environmental Engineering Dept. — Mar 2021 – Present

Visiting Assistant Professor — Aug 2020 – Feb 2021

Instructional Intern — Jan 2020 – May 2020

- Duties and responsibilities include teaching, service, and conducting scholarly research in environmental engineering
- Teaching & Service
  - Responsible for teaching environmental engineering courses, including ENV 2003 Introduction to Environmental Engineering, ENV 3008 Environmental Chemistry, EES 4201 Water Chemistry, ENV 4514 Water and Wastewater Treatment
  - Serving the university to teach some general STEM courses for university freshmen students, such as IDS 1380 Intro to STEM
  - Providing guidance and insights in the field of sustainability evaluation and water/wastewater treatment to the students in other disciplines
- Research
  - Conducting scholarly research in life cycle environmental assessment and cost analysis, process modeling, system-level optimization in terms of nutrient removal and recovery, stormwater management and wastewater treatment.
  - Research requires software skills in SimaPro, MATLAB, ArcGIS, Python programming, and lab experiment skills in water quality evaluation

EDUCATION

University of South Florida — Tampa, FL

Ph.D., Environmental Engineering — Aug 2020

- Dissertation: *Sustainable Nutrient Management Through Technology Evaluation and Spatial Optimization*

University of Missouri-Kansas City — Kansas City, MO

M.S., Environmental and Urban Geosciences — May 2014

- Certificate: Advanced Geographic information Systems (GIS)

East China Normal University Shanghai, China
B.S., Environmental Science, Minor in Finance Jul 2011

RESEARCH EXPERIENCE

Florida Polytechnic University Lakeland, FL
Assistant Professor Aug 2020 – Present

- Conducting a literature review of green infrastructure in terms of its performance and sustainability assessment
- Integrating a new hydrological module into the developed green infrastructure system optimization tool
- Planning a research proposal related to phosphorus control in phosphogypsum wastewater treatment

University of South Florida Tampa, FL
Research Assistant; Advisor: Dr. Qiong Zhang Jan 2015 – Aug 2020

- *Center for Transportation, Environment, and Community Health (CTECH), US DOT*
  - Developed a spatial optimization tool for green infrastructure implementation in terms of sustainable nutrient management with minimal environmental impacts and costs
  - Conducted a scenario analysis to explore the influence of implementing potential green infrastructure in terms of runoff control, nutrient management, and related environmental and economic impacts
  - Helped develop a SWMM-based hydrological model with fine resolution data in Tampa, FL
  - Developed a GIS-based method and built an ArcGIS geoprocessing tool to locate potential green infrastructure, measure their drainage areas, and identify their types
  - Created the GIS-based inventory of green infrastructure in Tampa, FL
  - Developed a GIS-based method to detect the implemented green infrastructure
- *Center for Reinventing Aging Infrastructure for Nutrient Management (RAINmgt), US EPA*
  - Developed the process model of bioretention systems with engineered ground plants and internal water storage zones
  - Quantified the environmental and economic impacts of bioretention systems associated with different configurations; Observed the trade-off between bioretention's nutrient removal performance, some environmental impacts and cost
  - Compared the environmental and economic impacts associated with both full-scale anaerobic and aerobic membrane bioreactors (MBRs) for municipal wastewater treatment under different scenarios of discharge and reuse; Expanded the potential of anaerobic MBR application on effluent irrigation for different crops
  - Explored the role of location in the environmental and economic performances of onsite wastewater treatment systems (OWTSs) relative to their nutrient management capabilities

University of Missouri-Kansas City Kansas City, MO

Research Assistant; Advisor: Dr. Wei Ji — Jun 2012 – Mar 2014

- Created a knowledge base, i.e., a set of decision rules for urban wetland detection
- Mapped the urban wetlands in the Kansas City metropolitan area by integrating the pixel-based classification with the knowledge-based approach, using SPOT satellite images
- Improved the mapping accuracy of urban wetlands utilizing knowledge-based image classification approach
- Assisted with the sub-pixel image classification using LIDAR data
- Composed master's thesis, *A knowledge-based approach of satellite image classification for urban wetland detection*

East China Normal University — Shanghai, China

Undergraduate Research Assistant; Advisor: Dr. Bing Xie — Oct 2009 – May 2011

- Analyzed the effluent quality of the landfill leachate treated by an aged refuse bioreactor
- Quantified the amount of anammox in the bioreactor using the Real-time PCR technique
- Established the gene library of anammox in the bioreactor by sequencing the gene fragments screened
- Composed undergraduate thesis, *Anammox community in the aged refuse bioreactor using 16s rRNA gene library technique*

Student Project Leader; Advisor: Dr. Yuanyuan Li — Mar 2009 – June 2010

- Sampled nine populations of *Solidago Canadensis*, an invasive species in Shanghai
- Investigated the population genetic structures of *Solidago Canadensis* using the random amplified polymorphic DNA (RAPD) technique

TEACHING AND MENTORING

Florida Polytechnic University — Lakeland, FL

Instructor, ENV2003 Introduction to Environmental Engineering — 2020, 2021
Instructor, ENV4042 Environmental Sensing — Fall 2021
Instructor, ENV4514 Water & Wastewater Treatment — Spring 2021
Instructor, IDS1380 Introduction to STEM — Fall 2020, Spring 2021
Instructor, EES4201 Water Chemistry — Fall 2020
Instructor, ENV3008 Environmental Chemistry — Fall 2020, Fall 2021
Lab Design Tutor, Lab Design Project for Environmental Engineering — Fall 2020

University of South Florida — Tampa, FL

Teaching Assistant, ENV4001 Environmental Systems Engineering — Spring, Fall 2019
Teaching Assistant, ENV4417 Water Quality & Treatment — Fall 2018
Teaching Assistant, EGN3311 Statics — Spring 2018
Teaching Assistant, EGN4453 Numerical & Computer Tools I — Spring, Fall 2015

University of Missouri-Kansas City — Kansas City, MO

Instructor, ENVS110 Understanding the Earth (Lab) — Fall 2013

Lab Instructor, GEOG5558 Satellite Climatology — Fall 2012, 2013
Lab Instructor, GEOG203 Introduction to GIS — Spring 2013
Lab Instructor, GEOG5507 Advanced GIS — Summer, Fall 2012

PEER-REVIEWED PUBLICATIONS

- **Xu, X.**, Ye, C., Hua, J., & Zhang, Q. Be effective and sustainable: A review of green stormwater infrastructure. ***Journal of Environmental Management*.** In preparation.
- **Xu, X.**, Ye, C., Schreiber, D., & Zhang, Q. Spatial optimization of sustainable green stormwater infrastructure system. ***Journal of Cleaner Production*.** In preparation.
- **Xu, X.**, Dao, H., Bair, R., Uman, A., Yeh, D., & Zhang, Q. (2020). Discharge or reuse? Comparative sustainability assessment of anaerobic and aerobic membrane bioreactors. ***Journal of Environmental Quality*.** doi:10.1002/jeq2.20012.
- Zhang, J., **Xu, X. (joint first author)**, Tejada-Martinez, A., Zhang, Q., & Wicklein, E. (2019). Evaluating reactor hydraulics in a cost-effective way: Numerical tracer study. ***AWWA Water Science***, 1(6): e1163.
- **Xu, X.**, Schreiber, D., Lu, Q., & Zhang, Q. (2019). A GIS-based framework creating green stormwater infrastructure inventory relevant to surface transportation planning. ***Sustainability***, 10(12): 4710.
- Liao, X., Li., C., **Xu, X.**, Lu, Q., & Ji, J. (2019). Grey water footprint and interprovincial virtual grey water transfers for China's final electricity demands. ***Journal of Cleaner Production***, 227: 111–118.
- **Xu, X.** & Zhang, Q. (2019). Sustainable configuration of bioretention systems for nutrient management through life cycle assessment and cost analysis. ***Journal of Environmental Engineering***, 145(5): 04019016.
- Diaz-Elsayed, N., **Xu, X.**, Balaguer-Barbosa, M., & Zhang, Q. (2017). An evaluation of the sustainability of onsite wastewater treatment systems for nutrient management. ***Water Research***, 121: 186–196.
- Ji, W., **Xu, X.**, & Murambadoro, D. (2015). Understanding urban wetland dynamics: Cross-scale detection and analysis of remote sensing. ***International Journal of Remote Sensing***, 36(7): 1763–1788.
- Wang, C., Xie, B., Han, L., & **Xu, X.** (2013). Study of anaerobic ammonium oxidation bacterial community in the aged refuse bioreactor with 16S rRNA gene library technique. ***Bioresource Technology***, 145: 65–70.

RESEARCH REPORTS

- Spatial Sustainability Assessment of Green Stormwater Infrastructure for Surface Transportation Planning, Phase II, Final Report. 2019, Report to U.S. Department of Transportation.

- Spatial Sustainability Assessment of Green Stormwater Infrastructure for Surface Transportation Planning, Phase I, Final Report. 2018, Report to U.S. Department of Transportation.

CONFERENCE PROCEEDINGS

- **Xu, X.**, Diaz-Elsayed, N., & Zhang, Q. (2018). The Role of location in sustainable nitrogen removal for onsite wastewater treatment systems. Proceedings of ***WEF** (Water Environment Federation)* ***Nutrient Removal and Recovery***, Raleigh, NC, Jun 18–21.
- **Xu, X.** & Zhang, Q. (2016). Life cycle assessment of bioretention systems for nutrient management, Proceedings of ***StormCon 2016***, Indianapolis, IN, Aug 22–25.
- **Xu, X.** & Ji, W. (2014). Knowledge-based algorithm for satellite image classification of urban wetlands. Proceedings of ***ICCMSE 2014*** *(10th International Conference of Computational Methods in Sciences and Engineering)*, Athens, Greece, April 4–7.
- **Xu, X.** & Ji, W. (2013). A knowledge-based approach of satellite image classification for urban wetland detection. Abstract Proceedings of ***2013 AAG*** *(Association of American Geographers) Annual Meeting*, Los Angeles, CA, April 9–13.

SELECTED PRESENTATIONS AND INVITED TALKS

- "Identifying potential green stormwater infrastructure sites for future implementation," USF GIS Day, Tampa, FL, Nov 13, 2019. Oral presentation.
- "Discharge or reuse? Comparative sustainability assessment of AnMBR and AeMBR," Florida Water Environment Association (FWEA), Tampa, FL, Apr 15, 2019. Poster presentation.
- "Factors impacting sustainability assessment of nutrient management," USF Environmental & Water Resources Engineering (EWRE) Seminar, Tampa, FL, Feb 8, 2019. Invited talk.
- "A GIS-based framework creating green stormwater infrastructure (GSI) inventory relevant to surface transportation planning," Center for Transportation, Environment and Community Health (CTECH), Davis, CA, Nov 9, 2018. Poster presentation.
- "Sustainability assessment of green stormwater infrastructure," Jilin University, Changchun, China, July 12, 2018. Invited talk.
- "The role of location in sustainable nitrogen removal for onsite wastewater treatment systems," WEF Nutrient Removal and Recovery Conference, Raleigh, NC, Jun 19, 2018. Oral presentation.
- "Life cycle assessment of bioretention systems for nutrient management," AEESP Distinguished Lecture, Orlando, FL, Mar 23, 2018. Poster presentation.
- "Comparison of anaerobic and aerobic membrane bioreactors for different end uses through life cycle assessment," Association of Environmental Engineering and Science Professors (AEESP), Ann Arbor, MI, June 22, 2017. Oral presentation.
- "Fit for the purpose: Reducing the Environmental Impact of AnMBR," Florida Water Environment Association (FWEA), West Palm Beach, FL, Apr 24, 2017. Poster presentation.

- “Location analysis of sustainable onsite wastewater treatment systems for nutrient management,” USF Graduate Student Research Symposium, Tampa, FL, Mar 20, 2017. Poster presentation.
- “Life cycle assessment of bioretention systems for nutrient management,” AEESP Distinguished Lecture, Gainesville, FL, Sep 30, 2016. Poster presentation.
- “Life cycle assessment of bioretention systems for nutrient management,” StormCon 2016, Indianapolis, IN, Aug 23, 2016. Oral presentation.
- “Life cycle assessment of bioretention systems for nutrient management,” USF Graduate Student Research Symposium, Tampa, FL, Mar 28, 2017. Poster presentation.
- “A knowledge-based approach of satellite image classification for urban wetland detection,” Association of American Geographers (AAG), Los Angeles, CA, April 9, 2013. Oral presentation.

SELECTED AWARDS AND HONORS

- **First Prize**, Students and Young Professionals Poster Competition, FWEA — 2019
- **Honor Society Member**, Tau Beta Pi — 2017
- **Honor Society Member**, Phi Kappa Phi — 2013
- **Travel Grant**, University of Missouri-Kansas City — 2013
- **Winner’s Prize**, 18th “Daxia Cup” Research Competition, Shanghai — 2010
- **Excellent Student Scholarship**, East China Normal University, three times — 2008, 2009, 2010

RELATED PROFESSIONAL EXPERIENCE

Henkel Asia-Pacific and China Headquarters — Shanghai, China
Engineering Intern, Adhesives Technologies — Apr 2011 – Jul 2011

Shanghai Environmental Monitoring Center — Shanghai, China
Data Analyst Associate, Dept. of Atmospheric Monitoring — Sep 2010 – Oct 2010

SERVICE AND AFFILIATIONS

- Member, American Society of Civil Engineers (ASCE)
- Member, Water Environment Federation (WEF)
- Member, Association of Environmental Engineering and Science Professors (AEESP)
- Member, Association of American Geographers (AAG)
- Member, Florida Water Environment Association (FWEA)
- President, Chinese Student Christian Fellowship, Tampa, FL — Aug 2015 – Jun 2021
  Vice President — Aug 2015 – Sep 2019
- Vice President, Emmanuel Chinese Campus Mission, Kansas City, MO — Aug 2012 – Mar 2014
- Award Judge, 61st Greater Kansas City Science and Engineering Fair — Mar 2012

- Service Volunteer, EXPO 2010 Shanghai, China May 2010
- Director, Liaison Office, ECNU Student Government Sep 2008 – Jun 2009

SKILLS

Computer

- Life cycle assessment: SimaPro
- GIS and remote sensing: ArcGIS, ERDAS Imagine
- Programming: MATLAB, Python
- Process modeling and optimization
- Graphic design: AutoCAD, Adobe Illustrator, Photoshop
- Statistics: SPSS
- Microsoft Office

Lab experiment

- Water quality test
- Molecular ecology: DNA gel analysis quantification and extraction, RNA extraction, PCR amplification, DNA/RNA sequencing

Language

- Chinese (mother tongue); English (proficient)

Appendix D. Common Pre-requisite Form

Note: technical change only. February 2023 ACC Agenda.

RE: for ACC

Nelson, Lynn <Lynn.Nelson@flbog.edu>
To Tom Dvorske
Cc Nelson, Lynn

Reply | Reply All | Forward

Thu 2/2/2023 3:25 PM

You replied to this message on 2/2/2023 3:49 PM.

Hi Tom,

I met today on this, and it was agreed that these are technical changes. These have been added to the agenda for the February ACC meeting.

Thank you!

Lynn

From: Tom Dvorske <tdvorske@floridapoly.edu>
Sent: Tuesday, January 31, 2023 2:28 PM
To: Nelson, Lynn <Lynn.Nelson@flbog.edu>
Subject: for ACC

Hi Lynn—

I just got off the ACC Oversight Committee and it got me to thinking about our own requests to ACC. Back in October, I send a request to Lynda to add Civil Engineering to the agenda for Poly. Lynda indicated – and confirmed—she sent it to Michael Stowell to include on the agenda.

So, two things:

1. I meant to, but did not, include Industrial Engineering as well; form attached.
2. I am similarly submitting Industrial Engineering (simply an oversight—I thought I send it in October as well).

Both are TECHNICAL CHANGES only. Please let me know if there are issues. I would like them to be included on the February 22 Agenda.

Best to you,
Tom

Tom Dvorske, Ph.D. (He/Him/His)
Vice Provost of Academic Affairs
SACSCOC Liaison
Florida Polytechnic University
4700 Research Way
Lakeland, FL 33805-8531
Ph. 863.874.8544 | C. 337.263.6118
https://floridapoly.edu/

STATE UNIVERSITY SYSTEM OF FLORIDA

Common Prerequisite Request

Institution:	**Florida Polytechnic University**
Institution Liaison:	Tom Dvorske, Vice Provost of Academic Affairs
Date of Submission:	10.18.2022
Program/Degree Type:	**Bachelor of Science in Civil Engineering**
Program CIP Code:	14.0801
Program Credit Hours:	120

If applicable, please complete the following if you are notifying us of a change to:

Program Credit Hours:	Current Credit Hours: Click or tap here to enter text. New Credit Hours: Click or tap here to enter text. Effective Date: Click or tap here to enter text.
Limited Access Program Status:	☐ Change from open access to limited access ☐ Change from limited access to open access Effective Date: Click or tap here to enter text.
Program CIP Code:	Current CIP code: Click or tap here to enter text. New CIP Code: Click or tap here to enter text. Effective Date: Click or tap here to enter text.
Baccalaureate Program Status:	☐ Notification of a Program Termination - Term/Year Program Should be Removed from the CPM: Click or tap here to enter text. ☒ Notification of New Program - Anticipated Program Implementation Date: **Fall 2023**

STATE UNIVERSITY
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Proposed Revisions(s) to the CPM (check all that apply)

The CIP Code Is Currently in the CPM:

☐ 1. Make curriculum changes to an existing track at proposing institution

☒ 2. Add program to a current track without curriculum changes

☐ 3. Add program to a current track with curriculum changes

☐ 4. Establish a new track without prerequisites

☐ 5. Establish a new track with prerequisites

6. For numbers 1-5, please provide track information below:
   a. ☐ Track 1 ☐ Track 2 ☐ Track 3 ☐ Track 4 ☐ Track 5 ☐ Track 6
   b. Track Name: Click or tap here to enter text.
   c. If this is a request to establish a new track, please provide justification as to why a new track is needed: Click or tap here to enter text.

The CIP Code Is Not Currently in the CPM:

☐ 7. Add program to the CPM without prerequisites

☐ 8. Add program to the CPM with prerequisites

Proposed Curriculum Changes:

☐ Add course(s) and/or course alternative(s)

☐ Eliminate course(s) and/or course alternative(s) (delete course from the CPM)

☐ Exempt course(s) and/or course alternative(s) (request exception from course)

☐ Carry over prerequisites from previous CIP without changes

☐ Carry over prerequisites from previous CIP with changes

☒ Other – please specify No changes; only adding a program

Please include the following supporting documentation with this proposal.

- The program page from the Common Prerequisite Manual, if applicable.

See next page 3.

- The program requirements for the baccalaureate degree program at your institution.

See page 4. The table illustrates the structure of all Florida Poly baccalaureate programs and explains each category.

Program:	Civil Engineering	**CIP:**	14.0801
		Track:	1
Offered At:	FAMU, FAU, FGCU, FSU, UCF, UNF	**Program Length:**	128 Cr. Hrs.
	FIU		130
	UF, USF		131

REVISED 2/25/09
Technical course revision 10/23/2013
REVISED May 2015
Technical revision 7/3/2018

LOWER LEVEL COURSES

		Cr. Hrs.
	MACX311	4
or–	MACX281	4
&	MACX312	4
or–	MACX282	4
&	MACX313	4
or–	MACX283	4
&	MAPX302	3
or–	MAPX305	3
&	CHMX045/X045L	4
or–	CHMX045C	4
or	CHSX440/X440L	
&	PHYX048/X048L	4
or–	PHYX048C	4
or	PHYX041	3
&–	PHYX048L	1
&	PHYX049/X049L (1)	4
or–	PHYX049C	4
or	PHYX044	
&–	PHYX049L	
or	PHYX042	3
&–	PHYX049L	1

FOR ALL MAJORS: Students are strongly encouraged to select required lower division electives that will enhance their general education coursework and that will support their intended baccalaureate degree program. Students should consult with an academic advisor in their major degree area.

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(1) PHYX049L does not count toward the degree at FIU.

STATE UNIVERSITY SYSTEM OF FLORIDA

University Undergraduate Program Curriculum Template -- Category View

Category	Course	Credits	Code
I. Learning Foundations		**38**	
	Professional Foundations and Critical Communication	8	
	ENC 1101 - English Composition 1: Exp and Arg Writing (W)	3	GESR
	ENC 2210 - Technical Writing (W)	3	GESR
	EGN 1006 - Career Design for STEM Professionals	1	
	EGN 1007C - Concepts and Methods for Engineering and Computer Science	1	
	IDS 4941 - Professional Experience Internship	0	
	STEM Core	22	
	IDS 1380 - Foundational Lessons and Applications in Mathematics	3	
	COP 2271 - Introduction to Computation and Programming	3	
	MAC 2311 - Analytic Geometry and Calculus 1	4	
	MAC 2312 - Analytic Geometry and Calculus 2	4	
	CHM 2045 - Chemistry 1	3	
	CHM 2045L - Chemistry 1 Laboratory	1	
	PHY 2048 - Physics 1	3	
	PHY 2048L - Physics 1 Laboratory	1	
	Cultural and Social Awareness	12	
	ARH 2000 - Art Appreciation	3	GESRO
	PHI 2010 - Introduction to Philosophy	3	GESRO
	HUM 2020 - Introduction to the Humanities	3	GESRO
	MUL 2010 - Music Appreciation	3	GESRO
	LIT 2000 - Introduction to Literature	3	GESRO
	HUM 2022 Explorations in the Humanities (Various Topics)	3	GEO
	IDS 2144 Legal, Ethical, and Management Issues in Technology	3	GEO
	AMH 2010 - American History to 1877	3	GESRO
	AMH 2020 - American History Since 1877	3	**GESR**
	~~AMH 2930 - History: Special Topics~~	~~3~~	~~GEO~~
	ECO 2013 - Principles of Macroeconomics	3	GESRO
	ECO 2023 - Principles of Microeconomics	3	GESRO
	PSY 2012 - General Psychology	3	GESRO
II. Advanced Math and Science (some may be included in program core)		**15**	

&/OR	BSC 1010 - Biology 1	3	
	BSC 1010L - Biology 1 Laboratory (W)	1	
	EVR 1001 - Environmental Science	3	
	EVR 1001L - Environmental Science Lab	1	
	MAC 2313 - Analytic Geometry and Calculus 3	4	
	MAD 2104 - Discrete Mathematics	3	
	MAP 2302 - Differential Equations	3	
	PHY 2049 - Physics 2	3	
	PHY 2049L - Physics 2 Laboratory	1	
	STA 2023 - Statistics 1	3	
	STA 3032 - Probability and Statistics	3	
	MAS 3105 - Linear Algebra	3	
	MAS 3114 - Computational Linear Algebra	3	
III. Program Core		**≤55**	
REQ	XXX-4XXX Senior Capstone 1	3	
REQ	XXX-4XXX Senior Capstone 2	3	
IV. Concentration		**≡ 12**	
V. Electives		**0+**	
		120	

I. Learning Foundations -- Description

The courses in this category comprise the general education program. The State of Florida and institutional accreditors required 36 hours in GE, across broad disciplinary areas including communication, math, science, humanities, social sciences. Florida Poly include an additional two credits associated with professional foundations as part of the core learning foundations for all students. **These lists are largely prescriptive.**

Florida Poly's Learning Foundations core includes three sub-categories that address both broad educational essentials and institutional values such as critical thinking, team work in professional contexts, effective communication, and fundemental knowledge, skills, and behaviors in mathematics and science essential to STEM students' learning.

Professional Foundations and Critical Communication course support students' educational and career objectives and provide foundation for thoughtful and effective communication essential to career success and civic engagement.

STEM Core is the critical pathway to success for Florida Poly students. All courses must be passed with C or better and any grade lower than C results in required retake of that course in the subsequent semester. In some cases, a program my not required MAC 2312 to be taken.

Cultural and Social Awareness courses advance the objectives of a broad, liberal education for all students and provide foundation for students to make informed judgments that consider the impact of science, technology, and engineering solutions in global, economic, environmental, and social contexts.

CODE

GESR - General Education, State Required Course

GESRO - General Education, State Required Option - any GESRO course may be used to fulfil State of Florida gen ed options for this category.

GEO - General Education Option - so long as one GESR and one GESRO is met in each box, then any GEO may be taken to round out the Cultural and Social Awareness Category.

II. Advanced Math and Science -- Description

A Florida Poly students' foundational education continues to build with additional study in advanced mathematics and sciences to ensure that engineering and applied solutions are grounded in strong mathematical and scientific principles and methods.

Each program draws approximately 15 credits from this list. Some courses here may be included elsewhere, such as in program core, depending on the program's discipline and focus.

This list is not prescriptive, but descriptive of the different ways programs fulfill the advanced math/science category.

III. Program Core -- Description

Program core vary by discipline and degree program. All program core include multiple channels that round out disciplinary theory, application, and professional experience. For example, a typical construct includes a "core" of engineering sciences that parallel a design sequence. Another example is a program core that includes a programming channel, which may parallel a database/data analysis channel.

All programs culminate in a two-semester capstone design sequence where students collaborate on interdisciplinary teams in an effort to provide a solution to an industry-sponsored problem.

IV. Concentration(s) -- Description

Many programs include "concentrations." A 12-credit grouping of courses that augment the essential core curriculum of the degree program. Concentrations provide students with exposure to a subfield within the discipline and are intended to enhance the breadth of knowledge obtained within the degree. Concentrations are typically junior and senior year classes.

V. Electives -- Descriptions

Providing room is available in the curriculum, a program may include a slot or two for 3 - 6 credits (occasionally more) of elective credit. Elective courses should do for the program in a single course, what a concentration does over 4 courses: provides an exposure to a subfield/application/theory or other that adds depth and or breadth to the student's educational experience.

Total Credits.

All Florida Poly baccalaureate degree programs consist of 120 credit hours only. This is consistent with the standards for baccalaureate degrees and supports the State of Florida's emphasis on completion in four-years and reduced overall cost to students.

If this request is for any of the following, do not complete anything further:

- Add program to a current track without curriculum changes
- Establish a new track without prerequisites
- Add program to the CPM without prerequisites

If this request is for any of the following, please complete 1-7, where applicable:

- Make curriculum changes to an existing track at proposing institution
- Carry over prerequisites from previous CIP with no changes
- Carry over prerequisites from previous CIP with changes
- Add program to a current track with curriculum changes
- Establish a new track with prerequisites
- Add program to the CPM with prerequisites

1. For required prerequisite course(s) and/or course alternative(s), please list the following information for each course (add rows if necessary).

Course Prefix and Number	Course Title	Course Alternative	Justification for Course(s)	Credits
Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.	
Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.	
Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.	
Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.	
Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.	
			Total Credits	

2. If the course(s) above includes a course(s) that is offered currently at three or fewer FCS or SUS institutions, please provide justification as to why the course is critical for a student's success in the baccalaureate degree program. Please visit the Statewide Course Numbering System to determine the number of institutions that offer the course(s) (add rows if necessary). Click here for instructions on how to navigate the SCNS.

Course(s) limited to 3 or less FCS/SUS institutions	Number of FCS Institutions Currently Offering Course (out of 28)	Number of SUS Institutions Currently Offering Course (out of 12)	Justification for Course(s)
Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.
Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.
Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.

3. If the request includes courses that are offered only at your institution, explain what options are available to students at other institutions for completing the required courses (add rows if necessary).

Course(s) Only at Proposing Institution	Option(s) at Other Institutions	Explanation of Option(s)
Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.
Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.
Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.

4. If the request includes exemption from or elimination of a prerequisite course(s) and/or course alternative(s), please list the following information for each course that you would like to be exempt from or eliminate (add rows if necessary).

Course Prefix and Number	Course Title	Justification for Course Elimination/Exemption
Click or tap here to enter text.	Click or tap here to enter text.	☐ Exempt from Course ☐ Elimination of Course Click or tap here to enter text.
Click or tap here to enter text.	Click or tap here to enter text.	☐ Exempt from Course ☐ Elimination of Course Click or tap here to enter text.
Click or tap here to enter text.	Click or tap here to enter text.	☐ Exempt from Course ☐ Elimination of Course Click or tap here to enter text.

5. Please provide the college level prerequisite(s) for the common prerequisite course(s) if applicable (add rows if necessary).

Course Prefix	College Level Prerequisites	Credits
Click or tap here	Click or tap here to enter text.	
Click or tap here	Click or tap here to enter text.	
	Total Credits	

6. Please provide the information requested below for the review of common prerequisite completion within 60 credit hours.

Number of credit hours for AA	60
Subtract number of credit hours required for common prerequisites	-
Subtract number of college level course prerequisites for common prerequisite courses (if known)	-
Add the number of credit hours for common prerequisites that are also general education core requirements	+
Total number of credit hours left to complete the rest of the student's general education requirements	=

7. If a student does not have enough room in the "total" above to complete the rest of the general education requirements, please provide justification for requiring more common prerequisite course credit hours than can be accommodated by the student in 60 credit hours.

Click or tap here to enter text.

AGENDA ITEM: VI.B.2.

Florida Polytechnic University
Board of Trustees
Academic & Student Affairs Committee
February 8, 2023

Subject: **Approval of the Proposed Degree Program: B.S. Industrial Engineering**

Proposed Committee Action

Recommend approval of the proposed degree program, Bachelor of Science in Industrial Engineering, to the Board of Trustees.

Background Information

The formal degree proposal is included with this agenda item sheet.

Supporting Documentation: Bachelor of Science in Industrial Engineering

Prepared by: Dr. Tom Dvorske, Vice Provost Academic Affairs; Dr. Terry Parker, EVP & Provost

STATE UNIVERSITY
SYSTEM OF FLORIDA

Board of Governors, State University System of Florida
REQUEST TO OFFER A NEW DEGREE PROGRAM
In Accordance with BOG Regulation 8.011
(Please do not revise this proposal format without prior approval from Board staff)

Florida Polytechnic University **Institution Submitting Proposal**	**Fall 2023** **Proposed Implementation Term**
 Name of College(s) or School(s)	**Mechanical Engineering** **Name of Department(s)/Division(s)**
Industrial Engineering **Academic Specialty or Field**	**Bachelor of Science in Industrial Engineering** **Complete Name of Degree**
14.3501 **Proposed CIP Code (2020 CIP)**	

The submission of this proposal constitutes a commitment by the university that, if the proposal is approved, the necessary financial resources and the criteria for establishing new programs have been met prior to the initiation of the program.

Date Approved by the University Board of Trustees	**President's Signature** 2/7/23 **Date**
Board of Trustees Chair's Signature **Date**	**Provost's Signature** 02/03/2023 **Date**

PROJECTED ENROLLMENTS AND PROGRAM COSTS

Provide headcount (HC) and full-time equivalent (FTE) student estimates for Years 1 through 5. HC and FTE estimates should be identical to those in Appendix A – Table 1. Indicate the program costs for the first and the fifth years of implementation as shown in the appropriate columns in Appendix A – Table 3A or 3B. Calculate an Educational and General (E&G) cost per FTE for Years 1 and 5 by dividing total E&G by FTE.

Implementation Timeframe	HC	FTE	E&G Cost per FTE	E&G Funds	Contract & Grants Funds	Auxiliary/ Philanthropy Funds	Total Cost
Year 1	20	18	$44,500.67	$801,012	0	0	$801,012
Year 2	26	23					
Year 3	49	44					
Year 4	56	52					
Year 5	75	71	$19.372.69	$1,375,461	0	0	$1,375,461

Additional Required Signatures

I confirm that I have reviewed and approved Need and Demand Section III.F. of this proposal.

Gloria Nelson

Signature of Equal Opportunity Officer

January 23, 2023

Date

I confirm that I have reviewed and approved Non-Faculty Resources Section VIII.A. and VIII.B. of this proposal.

Kathryn M. Miller

Signature of Library Dean/Director

1-23-2023

Date

Introduction

I. Program Description and Relationship to System-Level Goals

A. Describe within a few paragraphs the proposed program under consideration, and its overall purpose, including:

- **degree level(s)**
- **majors, concentrations, tracks, specializations, or areas of emphasis**
- **total number of credit hours**
- **possible career outcomes for each major (provide additional details on meeting workforce need in Section III)**

Florida Polytechnic University proposes to add a Bachelor of Science – Industrial Engineering to the degree inventory. This 120 credit hour program draws from complementary areas of research and expertise among several programs already at the University. Our proposed program in Industrial Engineering covers manufacturing processes, operations research, production planning, all with a strong foundation in science, engineering, and mathematics. The program's uniqueness stems, in part, from a careful blending of these elements with key concepts in finance, management, and data science to prepare graduates to meet trends and opportunities in the marketplace. These elements help distinguish our proposed program from those to the east (UCF) and west (USF) in that their programs focus on management and production, respectively. Industrial engineers have been in high demand locally by companies such as Saddle Creek Logistics and Lakeland Regional Hospital. Florida Poly's Data Science program was identified by Analytics insight magazine as one of the top 10 data science institutes internationally.

B. If the proposed program qualifies as a Program of Strategic Emphasis, as described in the Florida Board of Governors 2025 System Strategic Plan, please indicate the category.

- **Critical Workforce**
  - ☐ Education
  - ☐ Health
  - ☐ Gap Analysis
- **Economic Development**
  - ☐ Global Competitiveness
  - ☒ Science, Technology, Engineering, and Math (STEM)

☐ Does not qualify as a Program of Strategic Emphasis.

II. Strategic Plan Alignment, Projected Benefits, and Institutional Mission and Strength

A. Describe how the proposed program directly or indirectly supports the following:

- **System strategic planning goals (see link to the 2025 System Strategic Plan on the [New Program Proposals & Resources] webpage)**
- **the institution's mission**
- **the institution's strategic plan**

The proposed program in Industrial Engineering supports the 2025 System Strategic Plan in several ways. Most notably for Florida Poly at this time, the University's program will support the following system goals:

- Teaching and Learning –
  - Efficient Degree Completion – industrial engineering is the culmination of several different existing pathways within the University. By including this program in the inventory, students who change majors will not have to go elsewhere and will still graduate on time.
  - Degrees in STEM – Industrial Engineering fits within the University's STEM mission and adds to Florida Poly's portfolio of engineering programs.
- Scholarship, Research, and Innovation –
  - Increasing undergraduate participation in research – as a primarily undergraduate serving institution at this time, focus on undergraduate research in collaboration with faculty is a critical component of our educational programming and preparation of students for professional work and advanced study.
- Community and Business Engagement
  - Increase faculty and student involvement in community and business engagement activities. Florida Poly's curriculum for all of its programs includes many of the same kinds of experiences. Industrial Engineering students will participate in a year-long senior capstone project sponsored by one of our many industry partners. These projects often lead directly to employment for these students, and because these projects require faculty oversight, faculty-industry relationship opportunities will grow.

Florida Polytechnic University is by legislation, statute, and mission defined as Florida's only STEM-focused, public University. Since its first semester in 2014, the University has carefully and progressively worked to fulfill that mission by building a full complement of core STEM programs, particularly in Engineering. The University holds ABET accreditation for programs in Mechanical Engineering, Computer Engineering, and Electrical Engineering, and the University's Computer Science program is also accredited by ABET-CAC. In the coming cycle, the University will seek ABET accreditation for Environmental Engineering, Engineering Physics, and Data Science. Florida Poly's mission – *to serve students and industry through excellence in education, discovery, and application of engineering and applied sciences* – frames the core academic programming the University designs and delivers. Industrial Engineering is a natural outgrowth of our existing programs and fits a key industry gap in the state. Industrial Engineers work in fields as diverse as logistics, manufacturing, and healthcare. The program will offer more options for our students and fit a critical need for Florida.

The University's current strategic plan (2018-2023) includes growing its academic program mix as one of the top priorities. The University will continue to advance this priority as it presently works to develop a new strategic plan for the next five-year cycle. Growing the University involves several components, of which adding degree programs is one, and second only to adding students. This program will attract and retain Florida Poly students.

B. Describe how the proposed program specifically relates to existing institutional strengths. This can include:

- **existing related academic programs**
- **existing programs of strategic emphasis**
- **institutes and centers**
- **other strengths of the institution**

Florida Poly's proposed Bacheleors fo Science in Industrial Engineering is a natural outgrowth from a selection of courses currently offered in DSBA, and included in the mechencial engineering program as a concentration in Operations Research. The program will draw from faculty from both Mechanical Engeering and Data Science and Business Analytics Departments, where faculty in these departments support elements of the proposed program such as foundations in engineering, manufacturing processes, finance, data science, and project management.

All of Florida Poly's programs fit into areas of strategic emphasis, specifically STEM. As a 100% STEM University, Florida Poly grows new programs out the existing resources – faculty, curriculum – to ensure efficiency in delivery and resources utilization as well as facilitate interdisciplinary collaboration and research.

Florida Poly's newest building, the Applied Research Center (ARC), houses much of the Faculty research capacity in a 90,000 sf venue. The proposed Industrial Engineering program complements the other degrees at Florida Poly with shared resources, notabley equipment and laboratories, to support teaching and research.

C. Provide the date the pre-proposal was presented to the Council of Academic Vice Presidents Academic Program Coordination (CAVP ACG). Specify whether any concerns were raised, and, if so, provide a narrative explaining how each concern has been or will be addressed.

Florida Poly presented the proposed program to the Council of Academic Vice Presidents – Academic Coordinating Group on November 8, 2022. No concerns were expressed and all SUS institutions were supportive of the proposal.

D. In the table below, provide a detailed overview and narrative of the institutional planning and approval process leading up to the submission of this proposal to the Board office. Include a chronology of all activities, providing the names and positions of both university personnel and external individuals who participated in these activities.

- **If the proposed program is a bachelor's level, provide the date the program was entered into the APPRiSe system, and, if applicable, provide narrative responding to any comments received from APPRiSe.**

Planning Process

Date	Participants	Planning Activity Description
Fall 2020	Academic Affairs Leadership: Provost Parker; Vice Provosts – Dvorske, Miller, Corpus; Department Chairs: Vollaro (Mechanical and environmental engineering), Taj (Data Science and Business Analytics), Rashid (Electrical and Computer Engineering), Towle (Computer Science), Hickman (Math and Physics).	Preliminary discussion among Academic Affairs leadership of prospective programs in line with University's Strategic Plan
04.2020	President Avent, Cabinet (Vice Presidents – Bowman, DeIulio, Parker), Board of Trustees (Otto, Chair)	Included on the University's Accountability plan is a note that Industrial Engineering (IE) is on the docket for consideration sometime in the next 2-3 years.
06.2021	President, Cabinet, Board of Trustees (see above), Academic Affairs Leadership Provost Parker; Vice Provosts – Dvorske, Miller, Corpus; Department Chairs: Vollaro (Mechanical and environmental engineering), Taj (Data Science and Business Analytics and Computer Science), Brilleslyper (Applied Mathematics), and Assistant Chairs, Demirel (Computer Science), and Sanchez (Data Science)	Industrial Engineering included on the Accountability Plan with a proposed date of submission to the University Board of Trustees for May 2022.
Fall 2021	Academic Affairs Leadership: see previous.	The decision was made to focus first on developing and delivering two master's degrees and hold off for another year for IE.
Spring 2022	Vollaro, Chair, Mechanical and Environmental Engineering Department, AA Leadership (see above).	Preliminary planning for program content and focus, decision about timeline for development and implementation.
April, May 2022	Vice Provost of Academic Affairs, Tom Dvorske & Vice Provost of Enrollment, Ben Mattew Corpus	Joint propose for FY'23 budget funds to conduct marketplace and positioning research for IE and other programs.

June - Aug 2022	Vollaro, Mechanical and Environmental Engineering Department with collaboration from Taj, Dept. of Data Science and Business Analytics (DSBA) for specialized transportation concentration.	Program development continues with the intent to bring it to the University's curriculum committee in the 2022-2023 academic year.
July 2022	Vice Provost of Academic Affairs, Tom Dvorske & Vice Provost of Enrollment, Ben Mattew Corpus	Funds for R&D hit departments' budgets. Contract with Eduventures initiated with multiple meetings between July and September 2022.
Fall 2022	Vollaro, Chair, Mechanical and Environmental Department; Taj, Chair, DSBA Department	Ongoing development during faculty Welcome Back Week. Curriculum development continues through fall.
10.18.2022	Vice Provost of Academic Affairs, Tom Dvorske	APPRISE Entry – No Comments
11.08.2022	Vice Provost of Academic Affairs, Tom Dvorske	CAVP-ACG – No Comments
01.2023	Vollaro, Chair, Mechanical and Environmental Department; Taj, Chair, DSBA Department	Curriculum submitted to Undergraduate Curriculum Committee (UCC) for consideration and approval
02.2023	Provost, Terry Parker	Approves program and submits program to Board of Trustees for approval.

Academic Program Pre-proposal Recognition System

W web_do_not_reply@flbog.net
To Tom Dvorske
11/29/2022

Dear TOM DVORSKE,

FLORIDA POLYTECHNIC UNIVERSITY entered information for a potential bachelor's degree program in APPRiSe.
The prospective program was titled Industrial Engineering in CIP code family: 14 ENGINEERING.
Please take the opportunity to review the prospective program and provide feedback, if appropriate. The comment period for this prospective program closes in 10 days on DECEMBER 9, 2022. We appreciate your continued participation in the system and the benefit your knowledge contributes to the development of bachelor's degree programs in Florida.

Sincerely,

Mike Sfiropoulos
Florida College System

Christy England
Board of Governors, State University System

Thank You
Automatic Notification
Do Not Reply

- **If the proposed program is a doctoral-level program, provide the date(s) of the external consultant's review in the planning table. Include the external consultant's report and the institution's responses to the report as Appendix B.**

Not Applicable

E. Provide a timetable of key events necessary for the implementation of the proposed program following approval of the program by the Board office or the Board of Governors, as appropriate, and the program has been added to the State University System Academic Degree Program Inventory.

Events Leading to Implementation –

Date	**Implementation Activity**
Assumes a April – July 2023 addition to inventory.	
June 2023	Update systems to include Industrial Engineering as a Degree option
June – July 2023	Update website and develop marketing materials for recruiting
July – August 2023	Develop a course availability matrix to assist transfer students and changes in major
August 2023	Officially launch program

Institutional and State Level Accountability

III. Need and Demand

A. Describe the workforce need for the proposed program. The response should, at a minimum, include the following:

- **current state workforce data as provided by Florida's Department of Economic Opportunity**
- **current national workforce data as provided by the U.S. Department of Labor's Bureau of Labor Statistics**
- **requests for the proposed program from agencies or industries in your service area**
- **any specific needs for research and service that the program would fulfill**

Related SOCs (11-3051 and 17-2112) show significant openings both nationally and in Florida on an annual basis. Nationally, there are nearly 40,000 openings for industrial engineers, while in Florida that number is approximately 1,500. Conferrals in the State lag considerably even when public and private institutions are included.

Among all engineering occupations in Florida over the next decade, Industrial engineering is projects to see the most growth. While covid-19 impacted job growth locally and nationally, Industrial engineering shows signed of continued recovery and is on a growth path in Florida.

Additionally, several top companies in Florida regularly post positions for industrial engineers.

Florida Company	Unique Job Postings Aug 2020 – July 2022
Ryder	374
Disney	257
Lockheed Martin	164
L3Harris Technologies	132
Raytheon Technologies	104
PWC	75
Northrop Grumman	60
KPMG	59
Lumen	56
Universal Orlando	52

Florida Poly annual research expenditures continue on a positive trend from $689,000 in FY 2020 to a projected $2,030,000 in FY 2023. Among institutionally defined peer institutions, the average research expenditure for Industrial Engineering is around $200,000.

The program in Industrial Engineering would seek ABET accreditation at the earliest possible time (upon reaching one graduate).

B. Provide and describe data that support student demand for the proposed program. Include questions asked, results, and other communications with prospective students.

Students are drawn to Florida Poly for several reasons – the 100% STEM focus, the smaller campus community environment, greater affinity with peers, and the opportunity to work closely with faculty, engage in co- and extra-curriculars that appeal to their interests, and many others. The University's STEM focus enables Florida Poly to cultivate a unique student experience for highly talented, STEM-interested majors who are looking for that personal touch and strong community engagement.

Demand for Florida Poly continues to rise. Undergraduate applications have increased by 35% in 2021 and again by 45% in 2022. Not only has student demand for rigorous, quality STEM programs in small classes increased, recent empirical research has demonstrated improved STEM academic outcomes, particularly for women, when there are small classes at small universities (Cissy, et al 2018, Bioscience). Based on data from Eduventures, the top five experiences Engineering-interested prospects are looking for are topic experiences the University offers: Internships; rigorous coursework; interactions with like-minded students, clubs, and activities; and research opportunities with faculty. This group also cares about academic strength, affordability, and career preparation. Florida Poly is low-cost to attend, and its graduates lead the system in median wages one-year after graduation.[2] The University is also recognized as the #1 public STEM University in the South.

Industrial Engineering degrees grew by 71% between 2012 and 2020, outpacing the overall bachelor's market (13%) and the overall engineering market (58%). In Florida, bachelor's conferrals in IE grew by 105% over that same time. Despite this demand, Florida produces only about 1/3 of the industrial engineers needed to fill the annual labor market gap.

Cissy J Ballen, Stepfanie M Aguillon, Rebecca Brunelli, Abby Grace Drake, Deena Wassenberg, Stacey L Weiss, Kelly R Zamudio, Sehoya Cotner, Do Small Classes in Higher Education Reduce Performance Gaps in STEM?, *BioScience*, Volume 68, Issue 8, August 2018, Pages 593–600, https://doi.org/10.1093/biosci/biy056
https://www.flbog.edu/wp-content/uploads/2022/10/2022_SYSTEM_Accountability_Plan_Final.pdf

C. Complete Appendix A – Table 1 (1-A for undergraduate and 1-B for graduate) with projected student headcount (HC) and full-time equivalents (FTE).

- **Undergraduate FTE must be calculated based on 30 credit hours per year**
- **Graduate FTE must be calculated based on 24 credit hours per year**

In the space below, provide an explanation for the enrollment projections. If students within the institution are expected to change academic programs to enroll in the proposed program, describe the anticipated enrollment shifts and impact on enrollment in other programs.

Enrollment projections are based on our experience with other recently implemented programs at the University. This typically begins with a "small" incoming class and gradually grows to a larger, sustainable enrollment. The University does not anticipate significant movement from other degree programs. The rate of major change at Poly is typically less than 3%. We will implement the program in fall 2023 for incoming first-year students only and transfer students who have less than 30 credits. This method has worked for us for all of our previously implemented programs and provides students, the faculty, and the University implementation time to deliver courses consistent with the academic progression of students in the major and to make improvements along the way.

D. Describe the anticipated benefit of the proposed program to the university, local community, and the state. Benefits of the program should be described both quantitatively and qualitatively.

A program in Industrial Engineering will be a draw to prospective students, increasing the University's enrollment and marketplace visibility. Bringing in a different kind of prospective engineer will also contribute to our campus culture by having further diversified student interests, clubs, co-curricular activities and programs. Growth of the university, through both addition of degree programs and student body growth, means more dollars to spend, more housing more dollars spent on and off-campus. This in turn provides demand to further develop off-campus amenities as a benefit to the campus and the local community.

The University maintains close relationship with companies such as Saddle Creek Logistics and Lakeland Regional Hospital.. These companies each play an important role in the fabric of the local economy and reflect a diverse range of professional opportunities that are available to students studying industrial engineering.

Finally, Central Florida is becoming a major center for warehousing, distribution, and logistics, an area we believe will further increase the demand Industrial Engineering students.

E. If other public or private institutions in Florida have similar programs that exist at the four- or six-digit CIP Code or in other CIP Codes where 60 percent of the coursework is comparable, identify the institution(s) and geographic location(s). Summarize the outcome(s) of communication with appropriate personnel (e.g., department chairs, program coordinators, deans) at those institutions regarding the potential impact on their enrollment and opportunities for possible collaboration in the areas of instruction and research.

The following tables illustrates comparable programs in the SUS. Feedback from SUS deans and representatives on the CAVP-ACG indicates that there remains no concern about any potential impact to enrollments at these institutions. The only private institution offering Industrial Engineering is University of Miami, which a fall 2021 enrollment of 120 students and 46 degree conferrals In our experience, students who are in the market for private Universities are typically not the student population that Florida Poly attracts.

Univ	Headcount, 5-yr Avg	Degrees, 5-yr Avg
FAMU	28.4	3.4
FSU	685	37
UCF	479.8	127.4
USF	251.4	69.4
UF*	460.8	124.4.
SUS**	609.2	180.8

UF* - CIP 14.2701

SUS** - includes both 14.2701 and 14.3501

F. Describe the process for the recruitment and retention of a diverse student body in the proposed program. If the proposed program substantially duplicates a program at FAMU or FIU, provide a letter of support from the impacted institution(s) addressing how the program will impact the institution's ability to attract students of races different from that which is predominant on the FAMU or FIU campus. The institution's Equal Opportunity Officer shall review this Section of the proposal, sign, and date the additional signatures page to indicate that all requirements of this section have been completed.

Goal #1 of Florida Poly's strategic plan 2018 – 2023 is to enroll a high-quality incoming class.

To impact this goal, the University has restructured its admission and financial aid operations to support stronger evidenced-based decision making, including market segmentation, reorganized its staffing model to improve coverage, tactics, and messaging, and changed its admissions process to include a holistic view of prospects through items such as essays and recommendation letters. Our enrollment continues to grow.

The programs at FIU and FAMU provided no indication of concern regarding any impact a Florida Poly industrial engineering program might have on their enrollment or diversity characteristics. Moreover, the proposed program, while similar, as all industrial programs must meet the same ABET criteria, differs in its unique elements and opportunities with respect to its applications in data science and business analytics. No letters from either institution have been received.

IV. Curriculum

A. Describe all admission standards and all graduation requirements for the program. Hyperlinks to institutional websites may be used to supplement the information provided in this subsection; however, these links may not serve as a standalone response. For graduation requirements, please describe any additional requirements that do not appear in the program of study (e.g., milestones, academic engagement, publication requirements).

There are no special admissions requirements for this program. Admissions requirements are the same for all Florida Poly students and a minimum is set by the Florida Board of Governors. Florida Poly recruits and selects students the University believes can be successful in our programs. Particular attention may be paid to test scores, high school GPA, and type(s) of any accelerated credit earned.

In general, students must complete the 120 credit hour program with a 2.0 or better and satisfy all program requirements. Florida Poly also requires that students complete an internship or equivalent professional experience during their program. Complete Graduation Requirements for a Baccalaureate degree are found in the Academic Catalog and in FPU-5.0094AP.

The following are minimum requirements for awarding the baccalaureate degree:

1. Satisfactory completion of the applicable college or program degree requirements and established curriculum as identified in the University Catalog in effect at the beginning of the student's most recent period of continuous enrollment.
2. Satisfactory completion of a minimum of one hundred twenty (120) credit hours with a cumulative GPA of 2.0 or better in coursework attempted at the University.
3. Satisfactory completion of thirty-six (36) credit hours of general education courses in communication, mathematics, social sciences, humanities, and natural sciences including six (6) credit hours of English Composition coursework and six (6) credit hours of mathematics courses at the college algebra level or higher. For the purposes of this rule, a grade of C or higher shall be considered successful completion.
4. Satisfactory completion of an additional six (6) credit hours of courses designated as "writing intensive" (W) by the University.
5. Satisfactory completion of at least forty-eight 48 credit hours of courses numbered 3000 and above.
6. Earn at least one-fourth of the credits applied towards the Baccalaureate degree, half of the major course credits, and the last thirty (30) credits in residence at Florida Poly. In cases of emergency, a maximum of six credits of the final thirty credits may be completed by correspondence or residence at another accredited institution with the approval of the program Department Chair and University Registrar.
7. Earn at least nine (9) credit hours in one or more summer semesters, unless the student entered the University with more than sixty (60) credit hours, or the University President or his/her designee waives this requirement.
8. Completion of the foreign-language admissions requirement.
9. Satisfactory completion of any pre-requisites or deficiencies as identified by the student's Faculty Advisor
10. Submission of a completed Graduation Application to the Office of the University Registrar so that it is received by the Registrar on or before the "Graduation Application Deadline" as noted on the Academic Calendar for the semester in which the student anticipates graduating.

B. Describe the specific expected student learning outcomes associated with the proposed program and include strategies for assessing the proposed program's learning outcomes. If the proposed program is a baccalaureate degree, include a hyperlink to the published Academic Learning Compact and the document itself as Appendix C.

The program in Industrial Engineering follows criteria set forth by the Engineering Accreditation Commission of ABET. The student outcomes for Industrial Engineering are as follows:

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. an ability to 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.
3. an ability to communicate effectively with a range of audiences.
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Program outcomes are supported by performance indicators – language that contextualizes these broader outcomes. Performance indicators are assessed in key courses throughout and near the end of the student's curriculum. Data is collected on a regular basis and a portion of the learning outcomes are reviewed annually.

The Academic Learning Compact, included in Appendix C, will be published after the program has been included in the SUS Inventory and can be posted and advertised in compliance with regulation.

C. If the proposed program is an AS-to-BS capstone, provide evidence that it adheres to the guidelines approved by the Articulation Coordinating Committee for such programs, as outlined in State Board of Education Rule 6A-10.024. Additionally, please list the prerequisites, if any, and identify the specific AS degrees that may transfer into the proposed program.

☒ Not applicable to this program because it is not an AS-to-BS Capstone.

D. Describe the curricular framework for the proposed program, including the following information where applicable:

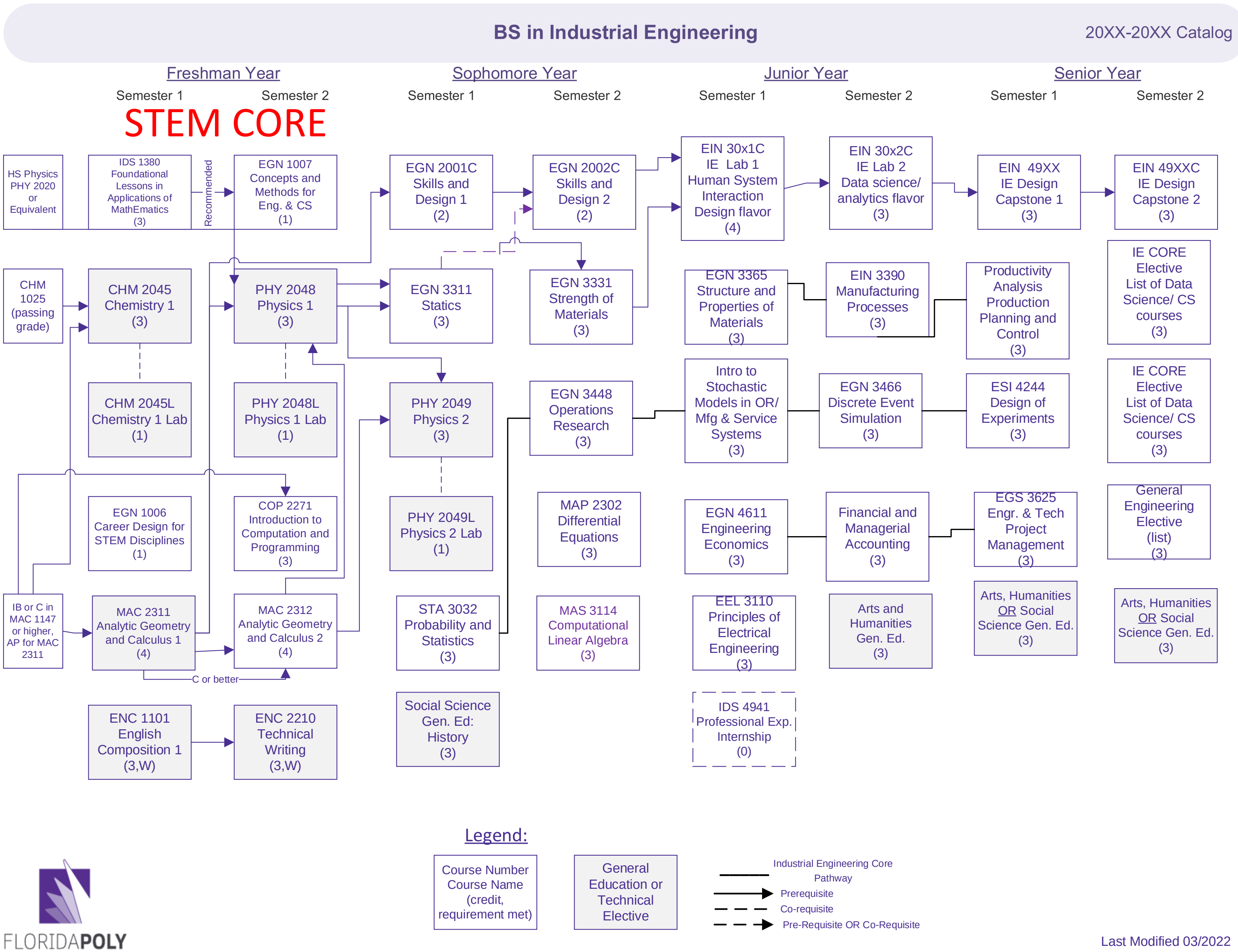
- **total numbers of semester credit hours for the degree**
- **number of credit hours for each course**
- **required courses, restricted electives, and unrestricted electives**
- **a sequenced course of study for all majors, concentrations, tracks, or areas of emphasis**

The proposed program in Industrial Engineering requires that students earn 120 credit hours for the degree. Two views of the program are presented here.

B.S. Industrial Engineering

Category	Section	Course	Credits	Notes
I. Professional Foundations Core			8	
		EGN 1006 - Career Design for STEM Professionals	*1*	
		IDS 4941 - Professional Experience Internship	0	Included in
		IDS 1380 - Foundational Lessons and Applications in Mathematics	*3*	Program
		EGN 1007C - Concepts and Methods for Engineering and Computer Science	*1*	Core
II. General Education		*State Required Minimum*	**36**	
	Rules	1. Students must complete at least one ♦ course in each category to satisfy state of Florida regulation.		
	Section A	**Communication**	**6**	
		ENC 1101 - English Composition 1: Exp and Arg Writing (W) ♦	**3**	
		ENC 2210 - Technical Writing (W)	**3**	
Programs must require 12 credits of Humanities & Social Sciences. These may be broken down evenly or by 3/9; 9/3; however, students must complete at least 3 credits of state required coursework in each category.	**Section B**	**Humanities (choose from)**	**3 to 6**	
		ARH 2000 - Art Appreciation (W) ♦	3	
		PHI 2010 - Introduction to Philosophy (W) ♦	3	
		HUM 2020 - Introduction to the Humanities (W) ♦	3	
		MUL 2010 - Music Appreciation (W) ♦	3	
		LIT 2000 - Introduction to Literature (W) ♦	3	
		HUM 2022 Explorations in the Humanities (Various Topics) (W)	3	
		IDS 2144 Legal, Ethical, and Management Issues in Technology	3	
	Section C	**Social Science (choose from)**	**3 to 6**	
		AMH 2010 - American History to 1877	3	
		AMH 2020 - American History Since 1877 (W) ♦ Satisfies Florida State Civics Requirement	3	
		AMH 2930 - History: Special Topics	3	
		ECO 2013 - Principles of Macroeconomics (W) ♦	3	
		ECO 2023 - Principles of Microeconomics (W)	3	
		PSY 2012 - General Psychology (W) ♦		
	Section D	**Mathematics**	**7**	
		MAC 2311 - Analytic Geometry and Calculus 1 ♦	4	
		MAP 2302 - Differential Equations	3	
	Section E	**Natural Sciences**	**8**	
		PHY 2048 - Physics 1 ♦	3	
		PHY 2048L - Physics 1 Laboratory	1	
		CHM 2045 - Chemistry 1 ♦	3	
		CHM 2045L - Chemistry 1 Laboratory (W)	1	
	Section F	**Advanced Math and Science -- GE**	**3**	
		STA 3032 - Probability and Statistics	3	
II. Program Foundations / Advanced Math & Science			**14**	*12 to 15*
		MAC 2312 - Analytic Geometry and Calculus 2	4	
		PHY 2049 - Physics 2	3	
		PHY 2049L - Physics 2 Laboratory	1	
		COP 2271C - Introduction to Computation and Programming (required for all	3	
		MAS 3114 - Computational Linear Algebra	3	

III. Program Core			**55**	
		40 credits represents a minimum, depending on how many credits are included in Category II, above.		
		Pre-Capstone design sequences should be included in this category--may be listed as a subset in catalog to stand out.		
Add Rows as needed		***The following should be counted in this category:***		
		** IDS 1380 - FLAME: Credits: 3*		
		** EGN 1007C - Concepts and Methods for Engineering and Computer Science: Credits: 3*		
	Design Block	EGN 1006 - Career Design for STEM Professionals	1	
		IDS 1380 - Foundational Lessons and Applications in Mathematics	3	
		EGN 1007C - Concepts and Methods for Engineering and Computer Science	1	
		EGN 2001C - Skills & Design 1	2	
		EGN 2002C - Skills & Design 2	2	
		EIN 30x1C - IE Lab 1 Human System Interaction	4	
		EIN 30x2C - IE Lab 2 Data Science & Analytics	3	
		EIN 49XX IE Design Capstone 1	see	
		EIN 49XX IE Design Capstone 2	below	
	IE Core	EGN 3311 - Statics	3	
		EGN 3331 - Strength of Materials	3	
		EGN 3448 - Operations Research	3	
		EGN 3365 - Structure and Properties of Materials	3	
		EIN 3XXX - Intro to Stochastic Models in OR/Manufacturing and Service Systems	3	
		EGN 4611 - Engineering Economics	3	
		EEL 3110 - Principles of Electrical Engineering	3	
		EIN 3390 - Manufacturing Processes	3	
		EGN 3466 - Discrete Event Simulation	3	
		FIN - 4XXX - Financial and Managerial Accounting	3	
		EIN - 4XXX - Productivity Analysis Production, Planning, and Control	3	
		ESI 4244 - Design of Experiments	3	
		XXX - Engineering Project Management	3	
V. Electives & Other Requirements			**9**	*3 or 6*
		The number of electives may be reduced to fill out the program core or meet institutional or state required general education requirements.		
		Data Science/CS Elective	3	
		Data Science/CS Elective	3	
		General Engineering Elective	3	
VI. Capstone			**6**	
		All programs are required to have a 6 credit senior capstone sequence.		
		EIN 49XX IE Design Capstone 1	3	
		EIN 49XX IE Design Capstone 2	3	
TOTAL HOURS			**120**	


BS in Industrial Engineering
20XX-20XX Catalog
Freshman Year
Sophomore Year
Junior Year
Senior Year
Semester 1
Semester 2
STEM CORE
HS Physics PHY 2020 or Equivalent
IDS 1380 Foundational Lessons in Applications of MathEmatics (3)
Recommended
EGN 1007 Concepts and Methods for Eng. & CS (1)
EGN 2001C Skills and Design 1 (2)
EGN 2002C Skills and Design 2 (2)
EIN 30x1C IE Lab 1 Human System Interaction Design flavor (4)
EIN 30x2C IE Lab 2 Data science/ analytics flavor (3)
EIN 49XX IE Design Capstone 1 (3)
EIN 49XXC IE Design Capstone 2 (3)
CHM 1025 (passing grade)
CHM 2045 Chemistry 1 (3)
PHY 2048 Physics 1 (3)
EGN 3311 Statics (3)
EGN 3331 Strength of Materials (3)
EGN 3365 Structure and Properties of Materials (3)
EIN 3390 Manufacturing Processes (3)
Productivity Analysis Production Planning and Control (3)
IE CORE Elective List of Data Science/ CS courses (3)
CHM 2045L Chemistry 1 Lab (1)
PHY 2048L Physics 1 Lab (1)
PHY 2049 Physics 2 (3)
EGN 3448 Operations Research (3)
Intro to Stochastic Models in OR/ Mfg & Service Systems (3)
EGN 3466 Discrete Event Simulation (3)
ESI 4244 Design of Experiments (3)
IE CORE Elective List of Data Science/ CS courses (3)
EGN 1006 Career Design for STEM Disciplines (1)
COP 2271 Introduction to Computation and Programming (3)
PHY 2049L Physics 2 Lab (1)
MAP 2302 Differential Equations (3)
EGN 4611 Engineering Economics (3)
Financial and Managerial Accounting (3)
EGS 3625 Engr. & Tech Project Management (3)
General Engineering Elective (list) (3)
IB or C in MAC 1147 or higher, AP for MAC 2311
MAC 2311 Analytic Geometry and Calculus 1 (4)
MAC 2312 Analytic Geometry and Calculus 2 (4)
STA 3032 Probability and Statistics (3)
MAS 3114 Computational Linear Algebra (3)
EEL 3110 Principles of Electrical Engineering (3)
Arts and Humanities Gen. Ed. (3)
Arts, Humanities OR Social Science Gen. Ed. (3)
Arts, Humanities OR Social Science Gen. Ed. (3)
C or better
ENC 1101 English Composition 1 (3,W)
ENC 2210 Technical Writing (3,W)
Social Science Gen. Ed: History (3)
IDS 4941 Professional Exp. Internship (0)
Legend:
Course Number Course Name (credit, requirement met)
General Education or Technical Elective
Industrial Engineering Core Pathway
Prerequisite
Co-requisite
Pre-Requisite OR Co-Requisite
FLORIDAPOLY
Last Modified 03/2022

E. Provide a brief description for each course in the proposed curriculum.

Freshman Year – STEM Core:

- IDS 1380 - Foundational Lessons in Applications of MathEmatics
  - Credits: 3
  - Course Description: This foundational course provides practical mathematical application to problems in engineering, computer science, and related STEM disciplines. All STEM applications will be presented within the context math topics and reinforced through extensive examples of their use in the core STEM courses. This course is designed to put the application first and then apply the mathematics to model or simulate it with hand calculations and/or computer software. Student will focus on their 'habits of mind' to consciously practice problem solving techniques, exercise best practice formats, and implement software that will provide the foundation for future success in a STEM curriculum.
  - Prerequisites: None
- CHM 2045 - Chemistry 1
  - Credits: 3
  - Course Description: This course introduces the principles of chemistry and their applications based upon the study of physical and chemical properties of the elements. Topics covered in this class includes: stoichiometry, atomic and molecular structure, the states of matter, chemical bonding, thermochemistry, and gas laws.
  - Prerequisites: None
  - Co-requisite or Prerequisite: Passing grade in CHM 1025
  - Co-requisite: CHM 2045L - Chemistry 1 Laboratory
- CHM 2045L - Chemistry 1 Laboratory
  - Credits: 1
  - Course Description: Students will participate in laboratory experiments designed to reflect the topics presented in CHM 2045 - Chemistry 1 . This course meets communication/writing-intensive requirements.
  - Prerequisites: None
  - Co-requisite: CHM 2045 - Chemistry 1
- EGN 1006 - Career Design for STEM Disciplines
  - Credits: 1
  - Course Description: This foundation course will provide students with an experience to engage in the academic process, training in skills for academic survival and professional success with implementation through participation in hands-on team project using basic skills from various STEM disciplines. Students will be introduced to teaming and leadership skills to gain introductory knowledge of design principles and exercise communication skills basic to academic and professional success.
  - Primary Term(s) Offered: Fall, Spring Rotation Year Annually
- MAC 2311 - Analytic Geometry and Calculus 1
  - Credits: 4
  - Course Description: This course is an introduction to analytic geometry; limits; continuity; differentiation of algebraic, trigonometric, exponential and logarithmic functions; applications of the derivative; inverse trigonometric functions; differentials; introduction to integration; and the fundamental theorem of calculus.
  - Prerequisites: Any of the following:
    - a grade of C in a MAC course numbered 1147 or higher
    - IB credit for a MAC course numbered 1147 or higher.
    - Any course grades, AP or IB scores used to meet this prerequisite must be on file by registration.
- ENC 1101 - English Composition 1: Expository and Argumentative Writing
  - Credits: 3
  - Course Description: This course focuses on the principal elements of writing clearly, efficiently and effectively. Logical arguments, building research skills and developing

critical thinking through reading, writing and discussion are also presented. This course meets communication/writing-intensive requirements (W).
    - Prerequisites: None
- EGN 1007 - Concepts and Methods for Engineering and Computer Science
    - Credits: 1
    - Course Description: Students learn foundational skills, calculation methods, and basic programming in Excel for engineering problems. This course supports students' abilities to calculate and analyze data and provide them a foundation for applying engineering skills throughout the curriculum, in internship, and employment.
    - Prerequisites: None
- PHY 2048 - Physics 1
    - Credits: 3
    - Course Description: This is the first of a two-semester sequence of physics for technology and engineering. The course covers Newtonian mechanics and includes motion, vectors, Newton's laws, work and conservation of energy, systems of particles, collisions, equilibrium, oscillations, thermodynamics and waves.
    - Prerequisites: High-school Physics and (PHY 2020 or the equivalent) and MAC 2311 - Analytic Geometry and Calculus 1
    - Co-requisite or Prerequisite: MAC 2312 - Analytic Geometry and Calculus 2
    - Co-requisite: PHY 2048L - Physics 1 Laboratory
- PHY 2048L - Physics 1 Laboratory
    - Credits: 1
    - Course Description: This laboratory experience for PHY 2048 Physics with MAC 2311 - Analytic Geometry and Calculus 1 provides practical applications of Newtonian mechanics.
    - Prerequisites: None
    - Co-requisite: PHY 2048 - Physics 1
- COP 2271 - Introduction to Computation and Programming
    - Credits: 3
    - Course Description: This course is an introduction to computational thinking and the art of computer programming using the C programming language. Students will learn fundamental programming concepts and systematic design techniques. They will use them to write programs that computationally solve and reduce problems. At the end of the course, students will be able to use a programming language without focusing on the language specifics. No prior programming background is required and a working knowledge of high school level algebra is expected.
    - Prerequisites: MAC 1147 - Pre-calculus Algebra and Trigonometry or equivalent, e.g. Aleks score
- MAC 2312 - Analytic Geometry and Calculus 2
    - Credits: 4
    - Course Description: Techniques of integration; applications of integration; differentiation and integration of inverse trigonometric, exponential, and logarithmic functions; sequences and series are presented in this class.
    - Prerequisites: A grade of C or better in MAC 2311 - Analytic Geometry and Calculus 1
- ENC 2210 - Technical Writing
    - Credits: 3
    - Course Description: This course focuses on the forms, formats, and genres of business, government, professional, and technical communication. Students are given opportunities to practice creating proposals, reports, applications, and resumes. This course meets communication/writing-intensive requirements (W).
    - Prerequisites: ENC 1101 - English Composition 1: Expository and Argumentative Writing

Sophomore Year:

- EGN 2001C - Skills and Design 1
    - Credits: 2

  - Course Description: This course aims to integrate engineering design activities with engineering graphical communications using Computer Aided Design (CAD) software and professional skills emphasizing teaming and leadership, and communication in a variety of mediums. Computer Aided Design (CAD) software is used as a tool to create 2D and 3D sketches, 3D parts, 3D assemblies, and engineering drawing per industry standards. Skills in parametric modeling include planning and model strategy, dimensioning and tolerances, perspectives, and use of basic features in the CAD software. The project will allow students to integrate these basic skills with additive manufacturing processes to develop solutions to real world engineering problems. This course will develop students' knowledge of design processes as well as basic mechanical engineering skills, which will begin to prepare them for future open-ended problems in their capstone design course.
  - Prerequisites: MAC 2311 - Analytic Geometry and Calculus 1
- EGN 3311 - Statics
  - Credits: 3
  - Course Description: This course covers the equilibrium of particles frames, machine, trusses and rigid bodies in two and three dimensions using vector algebra.
  - Prerequisites: PHY 2048 - Physics 1
  - Co-requisite or Prerequisite: MAC 2312 - Analytic Geometry and Calculus 2
  - Prerequisites: Letter grade of C or higher in MAC 2312 - Analytic Geometry and Calculus 2
- PHY 2049 - Physics 2
  - Credits: 3
  - Course Description: The second of a two-semester sequence of physics for scientists and engineers. Content includes Coulomb's law, electric fields and potentials, capacitance, currents and circuits, Ampere's law, Faraday's law, inductance, Maxwell's equations, electromagnetic waves, ray optics, interference and diffraction.
  - Prerequisites: PHY 2048 - Physics 1 and MAC 2312 - Analytic Geometry and Calculus 2
  - Co-requisite: PHY 2049L - Physics 2 Laboratory
- PHY 2049L - Physics 2 Laboratory
  - Credits: 1
  - Course Description: This laboratory experience for PHY 2049 - Physics 2 with MAC 2312 - Analytic Geometry and Calculus 2 illustrates the practical applications of Coulomb's law, electric fields and potentials, capacitance, currents and circuits, Ampere's law, Faraday's law, inductance, Maxwell's equations, electromagnetic waves, ray optics, interference and diffraction.
  - Prerequisites: None
  - Co-requisite: PHY 2049 - Physics 2
- STA 3032 - Probability and Statistics
  - Credits: 3
  - Course Description: This course is a survey of the basic concepts in probability and statistics with applications in electrical, mechanical, and civil engineering. Topics include probability, common discrete and continuous probability distributions, estimation and hypothesis testing, and simple regression.
  - **This course is not equivalent to STA 3036 - Probability and Statistics for Business, Data Science, and Economics and will not be approved as a substitution if you change majors into DSBA.
  - Prerequisites: MAC 2312 - Analytic Geometry and Calculus 2 with a grade of C or higher
- EGN 2002C - Skills and Design 2
  - Credits: 2
  - Course Description: This course aims to advance the knowledge and experience of students to use engineering tools and professional skills to seek solutions to real world problems. Students will engage in engineering design activities, use Computer Aided Design (CAD) software, and continue to mature with professional skills emphasizing teaming and leadership, and communication in a variety of mediums. Intermediate Computer Aided Design (CAD) skills including parts assembly, model motion and

analysis, and design tables. The project will allow students to integrate these intermediate level skills with subtractive manufacturing processes. This course will enhance students' knowledge of design processes as well as build intermediate level mechanical engineering skills, which will continue to prepare them future open-ended problems in their capstone design course.
    - Prerequisites: EGN 2001C - Skills and Design 1
    - Co-requisite or Prerequisite: EGN 3311 - Statics
- EGN 3331 - Strength of Materials
    - Credits: 3
    - Course Description: Topics include properties of materials; Mohr's Circle; Hooke's Law for isotopic materials; stress and strain; stress strain diagrams; design loads; safety and working stresses; shear and moment diagrams; beams of two materials; indeterminate axially-loaded members; torsional shearing stresses and loads; displacements; and flexural and transverse shear stresses.
    - Prerequisites: MAC 2312 - Analytic Geometry and Calculus 2 and EGN 3311 - Statics and PHY 2048 - Physics 1
- EGN 3448 - Operations Research
    - Credits: 3
    - Course Description: Basic approaches for modeling and solving operation efficiency challenges, and predicting and demonstrating cost-savings or other value-added gains.
    - Prerequisites: MAC 2311 - Analytic Geometry and Calculus 1 and (STA 2023 - Statistics 1 or STA 3032 Probability and Statistics)
- MAP 2302 - Differential Equations
    - Credits: 3
    - Course Description: The relationship between differential equations and initial conditions to physical problems in engineering, physics, technology and other applied areas is discussed. Students will be able to formulate, solve, and analyze the results of mathematical models of elementary physical problems and apply them. Topics include: first-order ordinary differential equations, theory of linear ordinary differential equations, solution of linear ordinary differential equations with constant coefficients, the Laplace transform and its application to solving linear ordinary differential equations.
    - Prerequisites: MAC 2312 - Analytic Geometry and Calculus 2 (with a minimum grade of C)
- MAS 3114 - Computational Linear Algebra
    - Credits: 3
    - Course Description: Linear equations, matrices, and determinants; vector spaces and linear transformations; inner products and eigenvalues. This course emphasizes computational aspects of Linear Algebra.
    - Prerequisites: MAC 2312 - Analytic Geometry and Calculus 2 with a grade of C or higher

Junior Year:

- EGN 3365 - Structure and Properties of Materials
    - Credits: 3
    - Course Description: The course introduces the fundamental concepts of materials science and engineering focusing the interrelationship between the microstructure of a material, its properties and its processing. The topics highlighted in this course are; material selection, crystallographic structure, diffusion, solidification, phase diagrams, phase transformation, microstructure and mechanical properties of different classifications of materials, which include metals, polymers, ceramics, and composites. The analysis of mechanical properties, the manufacturing process, the material specifications for a selected application or component, and the advantages and limitations of selected material are presented.
    - Prerequisites: CHM 2045 - Chemistry 1 and PHY 2048 - Physics 1
    - Co-requisite or Prerequisite: MAC 2312 - Analytic Geometry and Calculus 2
- EGN 4611 - Engineering Economics
    - Credits: 3

  - Course Description: The objective is to help engineering students recognize and understand the importance of cost factors that are inherent in all engineering decisions. Development of ability to handle engineering problems that involve economic factors. The course includes economic environment, selections in present economy, value analysis, critical path economy, interest and money-time relationships, depreciation and valuation, capital financing and budgeting, basic methods for undertaking economic studies, risk, uncertainty and sensitivity, selections between alternatives, fixed, increment, and sunk costs, the effects of income taxes in economic studies, replacement studies, minimum cost formulas, economic studies of public projects, economic studies in public utilities. Effects of inflation are considered at each step.
  - Prerequisites: Permission from Department Chair
- EEL 3110 - Principles of Electrical Engineering
  - Credits: 3
  - Course Description: Introduction to analysis of electric circuit analysis for steady-state and transient analysis applications: Ohm’s and Kirchhoff’s laws; analysis for DC and AC circuits; operational amplifiers, transistors, 1st and 2nd order systems; Filters, Laplace Transform, dc motors, circuit design.
  - Prerequisites: PHY 2049 Physics 2
  - Co-requisite: MAP 2302 Differential Equations
  - Primary Term(s) Offered: Fall, Spring Rotation Year
- IDS 4941 - Professional Experience Internship
  - Credits: 0
  - Course Description: This course is a co-curricular requirement that provides students with the opportunity to experience working in a professional environment or community-based organization where they can apply the knowledge and skills they have gained from their program.
  - This requirement may be satisfied through a traditional internship provided by an employer; a community service experience; or some other form of professional/entrepreneurial experience; pending approval by the Provost or designee. The student is assessed resident tuition and the associated fees for one credit hour (see BOG Regulation 7.0003 and University Policy FPU 4.001). A grade of satisfactory/unsatisfactory is earned and included on the transcript for the course.
  - Prerequisites: Completion of at least 72 Credit hours, or permission of Department Chair, Provost, or designee.
- EIN 3390 - Manufacturing Processes
  - Credits: 3
  - Course Description: This course introduces the fundamental workings of a variety of manufacturing processes. Analysis of a manufacturing process, its capabilities, typical applications, and its advantages and limitations focuses on production of simple and complex components. The topics highlighted in this course are; material selection, measurement and quality control, non destructive inspection techniques/ evaluation (NDT/ NDE), material removal using conventional and non traditional machining processes, casting, forming, joining, and the integration of these techniques into a manufacturing system.
  - Co-requisite or Prerequisite: EGN 3365 - Structure and Properties of Materials
- EGN 3466 - Discrete Event Simulation
  - Credits: 3
  - Course Description: Discrete Event Simulation models a large complex system in order to study and analyze its dynamic behavior over time. Simulation of complex discrete-event systems with applications in industrial and service industries. Course topics include modeling and programming, simulations in one or more high-level computer packages such as simul8, input distribution modeling, generating random numbers, and statistical analysis of simulation output data. The course will contain a team simulation project.
  - Co-requisite or Prerequisite: (STA 2023 or STA 3032) and COP 2271

Senior Year:

- EGS 3625 - Engineering & Technology Project Management
    - Credits: 3
    - Course Description: This course discusses planning, controlling, and evaluating technology and engineering projects. Topics include modeling, project organization, risk analysis, technical forecasting, time and cost estimation and accommodation, and resource allocation and leveling. Verbal and written technical and managerial reports are also required.
    - Prerequisites: None

NEW COURSES

- IE Lab 1 and IE Lab 2
    - Credits: 4 and 3
    - THIS COURSE INTRODUCES STUDENTS TO FUNDAMENTAL CONCEPTS IN INDUSTRIAL ENGINEERING AND MANUFACTURING MANAGEMENT. FIRST, THE COURSE WILL SURVEY FUNDAMENTAL TOPICS IN SUPPLY CHAIN MANAGEMENT AND LOGISTICS WITH SPECIFIC ATTENTION TO THE INTERPLAY BETWEEN MANUFACTURING SYSTEMS, PROCESS PLANNING, AND THE FLOW OF RESOURCES. THE COURSE ALSO COVERS TOPICS SUCH AS SCHEDULING, QUALITY CONTROL, FORECASTING, QUEUEING THEORY, DATA DRIVEN PRODUCTION CONTROL, ENGINEERING AND MANUFACTURING MANAGEMENT, AND PLANT OPERATIONS.

- Intro to Stochastic Models
    - Credits: 3
    - MODELING PRINCIPLES WITH EMPHASIS ON APPLICATIONS OF MARKOV CHAINS, QUEUING MODELS, SYSTEMS RELIABILITY, BAYESIAN DECISION ANALYSIS.

- Financial and Managerial Accounting
    - Credits: 3
    - THE STUDY OF THE USES OF ACCOUNTING DATA INTERNALLY BY MANGERS IN PLANNING AND CONTROLLING THE AFFAIRS OF ORANAIZATIONS.
- Productivity Analysis: Production Planning and Control
    - Credits: 3
    - ANALYSIS OF PRODUCTION AND INVENTORY SYSTEM. FORECASTING, SCHEDULING, SEQUENCING, PROJECT MANAGEMENT. DETERMINISTIC AND STOCHASTIC INVENTORY MODELS FOR SINGLE AND MULTI-ITEM SYSTEMS. ANALYSIS OF DISTRIBUTION SYSTEMS.

- Design of Experiments ESI 4244
    - Credits: 3
    - ACTIVITY FORECASTING MODELS AND CONTROL. DESIGN AND USE OF INVENTORY CONTROL MODELS, BOTH DESIGNS APPLICABLE TO ENGINEERING ANALYSES. ANALYSIS OF VARIANCE AND REGRESSION.

F. For degree programs in medicine, nursing, and/or allied health sciences, please identify the courses that contain the competencies necessary to meet the requirements identified in Section 1004.08, Florida Statutes. For teacher preparation programs, identify the courses that contain the competencies necessary to meet the requirements outlined in Section 1004.04, Florida Statutes.

☒ Not applicable to this program because the program is not a medicine, nursing, allied health sciences, or teacher preparation program.

G. Describe any potential impact on related academic programs or departments,

such as an increased need for general education or common prerequisite courses or increased need for required or elective courses outside of the proposed academic program. If the proposed program is a collaborative effort between multiple academic departments, colleges, or schools within the institution, provide letters of support or MOUs from each department, college, or school in Appendix D.

The program in Industrial Engineering is anticipated to help the University grow its overall enrollment. As such, there is no expectation that this program will unnecessarily impact or burden any one department as the overall growth plan for the University assumes additional degree programs. Florida Poly curricula are interdisciplinary in many areas. It is routine for programs to offer courses that have a mix of students from different disciplines, particularly design-based courses and core engineering science courses. The Mechanical Engineering department will offer the program as the bulk of the program's core already lives with the programs delivered through that department.

H. Identify any established or planned educational sites where the program will be offered or administered. If the proposed program will only be offered or administered at a site(s) other than the main campus, provide a rationale.

The program will be offered at greater than 50% face-to-face format on the University's main campus. Florida Poly has no plans at present to develop off-site locations for educational delivery.

I. Describe the anticipated mode of delivery for the proposed program (e.g., face-to-face, distance learning, hybrid). If the mode(s) of delivery will require specialized services or additional financial support, please describe the projected costs below and discuss how they are reflected in Appendix A – Table 3A or 3B.

The program will be offered at greater than 50% face-to-face format on the University's main campus. Therefore, no new or special resources will be necessary to support any distance-learning modality. Existing resources are sufficient to deliver the small amount that is already present in all of our curriculum (i.e. 2 credits, hybrid).

J. Provide a narrative addressing the feasibility of delivering the proposed program through collaboration with other institutions, both public and private. Cite any specific queries made of other institutions with respect to shared courses, distance/distributed learning technologies, and joint-use facilities for research or internships.

Florida Poly collaborates with UCF and USF on research and for faculty opportunities. With UCF, we have developed a future-faculty program that brings doctoral students near the end of their program onto our campus to teach courses and get a flavor of the actual academic career.

On the research front, many of our faculty work with and in labs at both UCF and USF and with colleagues at those institutions. The program in Industrial Engineering will similarly benefit from existing relationships and, undoubtedly, will encourage further collaboration between institutions.

At this point, any queries would be theoretical. As we onboard new faculty, more conversations about potential collaborations are anticipated.

K. Describe any currently available sites for internship and/or practicum experiences. Describe any plans to seek additional sites in Years 1 through 5.

☐ Not applicable to this program because the program does not require internships or practicums.

As industrial engineers focus on the efficiency of manufacturing processes and systems, we will be able to utilize many of our current corporate and government connections for internship sites. Specific examples include:

Industry	Company
Internet Services and Retailing	Amazon
Food and Drugstores	Publix
Logistics	Saddle Creek Logistics
Healthcare	Lakeland Regional Healthcare
Government	City of Lakeland

The University's Career Services Center has developed the following "Career Growth Plan" for all new programs the University implements:

- Year 1: Announce with our local audience the availability of industrial engineering at Florida Poly.
- Year 2: Utilize Curriculum Advisory Boards to strategize on outreach for industrial engineering career opportunities.
- Year 3: Ensure industrial engineering is represented at campus career events.
- Year 4: Review and assess additional steps necessary to connect students with professional opportunities in the industrial engineering field.

V. Program Quality Indicators - Reviews and Accreditation

A. List all accreditation agencies and learned societies that would be concerned with the proposed program. If the institution intends to seek specialized accreditation for the proposed program, as described in Board of Governors Regulation 3.006, provide a timeline for seeking specialized accreditation. If specialized accreditation will not be sought, please provide an explanation.

- ABET – Engineering Accreditation Commission

Industrial Engineering will be an ABET accredited program at Florida Poly, ensuring a consistency of quality and practice across all of our degree programs.The University and department will begin the process at the earliest possible date (last semester of the first program graduate), the University will submit a request for evaluation and begin the process with the Engineering Accreditation Commission of ABET. Assuming a fall 2023 implmentation, the process could begin as early as spring 2027.

B. Identify all internal or external academic program reviews and/or accreditation visits for any degree programs related to the proposed program at the institution, including but not limited to programs within academic unit(s) associated with the proposed degree program. List all recommendations emanating from the reviews and summarize the institution's progress in implementing those recommendations.

Florida Polytechnic University programs in Mechanical Engineering, Computer Engineering, Electrical Engineering, and Computer Science all hold ABET accreditation. All programs were approved for a 6-year period, with Mechanical having submitted a 3-year report, which was accepted with no additional report required.

C. For all degree programs, discuss how employer-driven or industry-driven competencies were identified and incorporated into the curriculum. Additionally, indicate whether an industry or employer advisory council exists to provide input for curriculum development, student assessment, and academic-force alignment. If an advisory council is not already in place, describe any plans to develop one or other plans to ensure academic-workforce alignment.

Learning Outcomes for the program in Industrial Engineering come directly from ABET criterion 3. These outcomes are developed by collection of societies of professional engineers and academics who make up the organization called ABET; thus, the learning outcomes are industry/employer-driven.

Similarly, ABET requires that its programs include "Educational Objectives" (PEOs) that are broad statements that speak to what graduates should accomplish within a few years of earning their degree. These objectives are periodically reviewed by the program's Curriculum Advisory Board (CAB), made up of industry partner representatives and academics from other institutions. When starting a new program, Florida Poly draws on the PEOs of its other programs as a starting point for the CAB's review. The PEOs for Industrial Engineering are as follows:

- Graduates demonstrate growth in professional development through graduate study or professional training.
- Graduates demonstrate effective team work as members and leaders in professional environments.
- Graduates demonstrate employability in industry, government, and entrepreneurial endeavors.

Florida Polytechnic University's mission is to "*serve students and industry through excellence in education, discovery, and application of engineering and applied sciences*." The program in Industrial Engineering directly supports these goals through program content in engineering designed to educate students to be successful professionals that serve a range of public, private, and government industries and enhance the research reputation and economy of the state of Florida in keeping with the University System's strategic plan.

VI. Faculty Participation

A. Use Appendix A – Table 2 to identify existing and anticipated full-time faculty who will participate in the proposed program through Year 5, excluding visiting or adjunct faculty. Include the following information for each faculty member or position in Appendix A – Table 2:

- **the faculty code associated with the source of funding for the position**
- **faculty member's name**
- **highest degree held**
- **academic discipline or specialization**
- **anticipated participation start date in the proposed program**
- **contract status (e.g., tenure, tenure-earning, or multi-year annual [MYA])**
- **contract length in months**
- **percent of annual effort that will support the proposed program (e.g., instruction, advising, supervising)**

This information should be summarized below in narrative form. Additionally, please provide the curriculum vitae (CV) for each identified faculty member in Appendix E.

As Appendix A illustrates, the University has seven full-time, multi-year contract faculty who provide direct and supportive instruction and research associated with the program. Additionally, the University is posting advertisements for Industrial Engineering faculy in spring 2023; however, we are off-cycle. Additionally, we have recently hired a faculty member in the Department of Data Science and Business Analytics (DSBA) who will support the finance and date science aspects of the curriculum. These are critical, but not "core" elements of the program, and these courses are taught regularly; thus, DSBA performs a service role for the degree program by delivering the courses already in its curricula for its own programs. Notably, the addition of students from another major would enhance the quality and experience of these courses without resuling in an overburdensome load based on historical enrollments in these courses.

In fall 2023, we will begin faculty recruitment for the program for the upcoming years. By Year 5, we anticipate at least five full-time credentialed faculty to be on staff to provide primary delivery and quality assurance of the program.

B. Provide specific evidence demonstrating that the academic unit(s) associated with the proposed program have been productive in teaching, research, and service. Such evidence may include trends over time for average course load, FTE productivity, student HC in major or service courses, degrees granted, external funding attracted, and other qualitative indicators of excellence (e.g., thesis, dissertation, or research supervision).

The following workload summary describes the relative proportion of each faculty members's workload. CVs illustrate their productivity in the areas of research, in particular.

Appendix D. Faculty Workload Summary

Facuty Workload Summary for Industrial Engineering

Academic Year 2022 - 2023

Facuty Member	PT or FT	Classes Taught (Course No./Credit Hrs.)	Teaching	Research or Scholarship	Service/ Other	Acad. Admin.	% Time Devoted to the Program
Fall 2022							
Mechanical Engineering							
Mary Vollaro	FT	IDS 1380 Fundamental Lessons in Applications of Mathematics	33%		13%	54%	100%
Mohammad Reza Khalghani	FT	EEL 3110 Principles of Electrical Engineering EGN 2001C Skill and Design 1 EGN 5975 Thesis 2 EGL 4500 Design & Analysis of Machine Components	66.70%	22.90%	10.40%		100%
Elizabeth Kames	FT	EGN 1006 Career Design for STEM Discipline EGN 2001C Skill and Design 1 EGL 4500 Design & Analysis of Machine Components	78.60%	14.30%	7.10%		100%
Data Science and Business Analytics							
Shahram Taj	FT	MAN 5596 Global Supply Chain Management	25%	16.70%	8.30%	50%	100%
James Dewey	FT	IDS 4942 Data Analytics Capstone 1 IDS 5950 Project	33.4%	58.30%	8.33%		100%
Rei Sanchez-Arias	FT	COP 5090 Scientific Computation and Programming	25.00%	41.67%	8.33%	25%	100%
Artem Malinin	FT	ACG 2020 Accounting for Managers ACG 2071 Financial and Managerial Accounting ECP 4031 Benefit Cost Analysis	81.80%	12.10%	6.10%		100%

VII. Budget

A. Use Appendix A – Table 3A or 3B to provide projected costs and associated funding sources for Year 1 and Year 5 of program operation. In narrative form, describe all projected costs and funding sources for the proposed program(s). Data for Year 1 and Year 5 should reflect snapshots in time rather than cumulative costs.

For Fiscal Year 2023, the University received an increase to its base budget of approximately $5.1 million, which goes almost entirely to supporting program growth, including new faculty. The initial cost of the Industrial Engineering program is well below this threshold, even as projected in year five.

Additionally, in 2018 the University received a recurring appropriation of $4.8 million that we have applied to the development and implementation of new programs. Of this appropriation, around $1.4 million has yet to be directly allocated to a degree program. The total operating revenue for new programs and faculty sits at around $6.5 million.

B. Use Appendix A – Table 4 to show how existing Education & General (E&G) funds will be reallocated to support the proposed program in Year 1. Describe each funding source identified in Appendix A – Table 4, and provide a justification below for the reallocation of resources. Describe the impact the reallocation of financial resources will have on existing programs, including any possible financial impact of a shift in faculty effort, reallocation of instructional resources, greater use of adjunct faculty and teaching assistants, and explain what steps will be taken to mitigate such impacts.

As noted in the previous section (VII.A.), due to recurring appropriations to the University, allocations will not impact or create any shifts in the resource support for existing programs.

C. If the institution intends to operate the program through continuing education, seek approval for market tuition rate, or establish a differentiated graduate-level tuition, as described in Board of Governors Regulation 8.002, provide a rationale and a timeline for seeking Board of Governors' approval.

☒ Not applicable to this program because the program will not operate through continuing education, seek approval for market tuition rate, or establish a differentiated graduate-level tuition

D. Provide the expected resident and non-resident tuition rate for the proposed program for both resident and non-resident students. The tuition rates should be reported on a per credit hour basis, unless the institution has received approval for a different tuition structure. If the proposed program will operate as a continuing education program per Board of Governors Regulation 8.002, please describe how the tuition amount was calculated and how it is reflected in Appendix A – Table 3B.

Tuition for this program remains the same as it does for all Florida Poly programs. Our posted tuition and fees as of January 26, 2023 is as follows:

Undergraduate

UNDERGRADUATE	RESIDENT	NON-RESIDENT
Tuition	$105.07	$105.07
Out-Of-State Fee	-	$510.00
Financial Aid Fee	$5.25	$5.25
Non-Resident Financial Aid Fee	-	$25.50
Capital Improvement Trust Fund Fee	$4.76	$4.76
Transportation Fee	$3.00	$3.00
Activity and Service Fee	$17.62	$17.62
Athletic Fee	$14.12	$14.12
Health Fee	$9.58	$9.58
Technology Fee	$5.25	$5.25

E. Describe external resources, both financial and in-kind support, that are available to support the proposed program, and explain how this amount is reflected in Appendix A – Table 3A or 3B.

All Florida Poly programs have the same access to Florida Poly Foundation funds. These funds provide mostly student scholarships although can be used for other purposes such as faculty development, research, or programming associated with the degree program or field.

Appendix A, Tables 3A/3B reflect this in the absence.

VIII. Non-Faculty Resources

A. Describe library resources currently available to implement and/or sustain the proposed program through Year 5 below, including but not limited to the following:

- **the total number of volumes and serials available in the discipline and related disciplines**
- **all major journals that are available to the university's students**

The Library Director must sign the additional signatures page to indicate that they have review Sections VIII.A. and VIII.B.

The Florida Polytechnic University Library is comprised of two distinct collections: the main library collection is a multi-disciplinary digital library, and the Florida Industrial Phosphate Research (FIPR) Institute collection is primarily a comprehensive collection of phosphate-related resources and archival materials. There was a conscious effort at the inception of the institution to establish the main library as an entirely digital library. The Florida Polytechnic University Library provides specialized, STEM-focused resources and learning opportunities for students, faculty, and staff to work successfully with, interpret, and utilize information. Students at Florida Polytechnic University have 24/7/365 access to library resources via the internet.

The Florida Polytechnic University's main library is located on the second floor of the University's Innovation, Science and Technology Building, in an open-space area called the Commons. The main, digital collection contains over 150,000 full text eBook volumes that are a mixture of owned and licensed materials. There is no physical stack area.

The University Library provides support for all the degrees offered at the institution, and currently supports Masters and Bachelors programs in Computer, Electrical and Mechanical Engineering. Resources that directly support Florida Poly's current engineering programs will also directly support the proposed Industrial Engineering program. Current library resources include: AccessEngineering, American Society of Mechanical Engineers (ASME), Engineering Village (Inspec and Compendex), Elsevier's Science Direct, EBSCO Engineering Core eBook collection and databases, IEEE Electronic Library, and ProQuest's SciTech Premium Collection, and SpingerLINK.

Major journals currently available through the Florida Poly Library that will directly support Industrial Engineering are:

- IEEE Transactions on Industrial Informatics (2005 – Present)
- IEEE Transactions on Engineering Management (1963 – Present)
- Journal of Manufacturing Technology Management (1993 – Present)

B. Discuss any additional library resources that are needed to implement and/or sustain the program through Year 5. Describe how those costs are reflected in Appendix A – Table 3A or 3B.

☒ Not applicable to this program because no additional library resources are needed to implement or sustain the proposed program.

C. Describe any specialized equipment and space currently available to implement and/or sustain the proposed program through Year 5.

Industrial Engineering has no needs for specialized laboratories beyond what is either planned or in place and the delivery of its classes and labs fits within our overall building plans which include some space in the coming years for teaching expansion with student body growth (moving to full teaching utilization of the new teaching rooms in the Applied Research Center). In addition, there will be a small increase in teaching space that will come with the Gary Wendt Engineering Building which will be completed in two or so years. For laboratories, Industrial Engineering is a "modeling" based field with strong industry ties and will rely on the computational infrastructure that is already in place. In the lower division courses, the laboratories are already in place, and our planning for student body growth includes expansion of the capacity in these laboratories.

D. Describe any additional specialized equipment or space that will be needed to implement and/or sustain the proposed program through Year 5. Include any projected Instruction and Research (I&R) costs of additional space in Appendix A – Table 3A or 3B. Costs for new construction should be provided in response to Section X.E. below.

☒ Not applicable to this program because no new I&R costs are needed to implement or sustain the program through Year 5

E. If a new capital expenditure for instructional or research space is required, indicate where this item appears on the university's fixed capital outlay priority list. Appendix A – Table 3A or 3B includes only I&R costs. If non-I&R costs, such as indirect costs affecting libraries and student services, are expected to increase as a result of the program, describe and estimate those expenses in narrative form below. It is expected that high enrollment programs, in particular, would necessitate increased costs in non-I&R activities.

☒ Not applicable to this program because no new capital expenditures are needed to implement or sustain the program through Year 5.

F. Describe any additional special categories of resources needed to operate the proposed program through Year 5, such as access to proprietary research facilities, specialized services, or extended travel, and explain how those projected costs of special resources are reflected in Appendix A – Table 3A or 3B.

☒ Not applicable to this program because no additional special categories of resources are needed to implement or sustain the program through Year 5.

G. Describe fellowships, scholarships, and graduate assistantships to be allocated to the proposed program through Year 5, and explain how those are reflected in Appendix A – Table 3A or 3B.

☒ Not applicable to this program because no fellowships, scholarships and/or graduate assistantships will be allocated to the proposed program through Year 5.

IX. Required Appendices

The appendices listed in tables 1 & 2 below are required for all proposed degree programs except where specifically noted. Institutions should check the appropriate box to indicate if a particular appendix is included to ensure all program-specific requirements are met. Institutions may provide additional appendices to supplement the information provided in the proposal and list them in Table 4 below.

Table 1. Required Appendices by Degree Level

Appendix	Appendix Title	Supplemental Instructions	Included? Yes/No	Required for Degree Program Level		
				Bachelors	Masters/ Specialist	Doctoral/ Professional
A	Tables 1-4		**Yes**	X	X	X
B	Consultant's Report and Institutional Response					X
C	Academic Learning Compacts	Include a copy of the approved or proposed Academic Learning Compacts for the program	**Yes**	X		
D	Letters of Support or MOU from Other Academic Units	Required only for programs offered in collaboration with multiple academic units within the institution	**Not Applicable to this Proposal**	X	X	X
E	Faculty Curriculum Vitae		**Yes**	X	X	X
F	Common Prerequisite Request Form	This form should also be emailed directly to the BOG Director of Articulation prior to submitting the program proposal to the Board office for review.	**Yes**	X		
G	Request for Exemption to the 120 Credit Hour Requirement	Required only for baccalaureate degree programs seeking approval to exceed the 120 credit hour requirement	**Not Applicable to this Proposal**	X		
H	Request for Limited Access Status	Required only for baccalaureate degree programs seeking approval for limited access status	**Not Applicable to this Proposal**	X		

Table 2. Additional Appendices

Appendix	Appendix Title	Description

Appendix A. Enrollment, Faculty, Financial Information

APPENDIX A
TABLE 1-A
PROJECTED HEADCOUNT FROM POTENTIAL SOURCES
(Industrial Engineering Baccalaureate Degree Program)

Source of Students (Non-duplicated headcount in any given year)*	Year 1 HC	Year 1 FTE	Year 2 HC	Year 2 FTE	Year 3 HC	Year 3 FTE	Year 4 HC	Year 4 FTE	Year 5 HC	Year 5 FTE
Upper-level students who are transferring from other majors within the university**	5	5	4	4	3	2	2	2	1	1
Students who initially entered the university as FTIC students and who are progressing from the lower to the upper level***	12	11	16	14	33	31	41	39	63	60
Florida College System transfers to the upper level***	3	2	3	2	6	5	6	5	6	5
Transfers to the upper level from other Florida colleges and universities***	0	0	2	2	5	4	5	4	3	3
Transfers from out of state colleges and universities***	0	0	1	1	2	2	2	2	2	2
Other (Explain)***	0	0	0	0	0	0	0	0	0	0
Totals	**20**	**18**	**26**	**23**	**49**	**44**	**56**	**52**	**75**	**71**

* List projected annual headcount of students enrolled in the degree program. List projected yearly cumulative ENROLLMENTS instead of admissions.
** If numbers appear in this category, they should go DOWN in later years.
*** Do not include individuals counted in any PRIOR CATEGORY in a given COLUMN.

APPENDIX A
Table 2
Anticipated Faculty Participation

Faculty Code	Faculty Name or "New Hire" Highest Degree Held Academic Discipline or Specialty	Rank	Contract Status	Initial Date for Participation in Program	Mos. Contract Year 1	FTE Year 1	% Effort for Prg. Year 1	PY Year 1	Mos. Contract Year 5	FTE Year 5	% Effort for Prg. Year 5	PY Year 5
A	Shahram Taj, Ph.D. Industrial Engineering	Prof.	MYA	Fall 2023	9	0.75	0.22	0.17	9	0.75	0.22	0.17
A	Mary Vollaro, Ph.D Mechanical Engineering	Prof.	MYA	Fall 2023	9	0.75	0.22	0.17	9	0.75	0.22	0.17
A	James Dewey, Ph.D. Economics	Asst. Prof.	MYA	Fall 2023	9	0.75	0.22	0.17	9	0.75	0.22	0.17
A	Rei Sanchez-Arias, Ph.D. Applied Mathematics	Asst. Prof.	MYA	Fall 2023	9	0.75	0.22	0.17	9	0.75	0.22	0.17
A	Mohammad Reza Khalghani, Ph.D Electrical Engineering	Asst. Prof.	MYA	Fall 2023	9	0.75	0.22	0.17	9	0.75	0.44	0.33
A	Artem Malinin, Ph.D. Finance	Asst. Prof.	MYA	Fall 2023	9	0.75	0.22	0.17	9	0.75	0.44	0.33
A	Elisabeth Kames, Ph.D. Mechanical Engineering	Asst. Prof.	MYA	Fall 2023	9	0.75	0.22	0.17	9	0.75	0.44	0.33
B	New Hire, Ph.D. Industrial Engineering	Asst. Prof.	MYA	Fall 2023	9	0.75	1.00	0.75	9	0.75	1.00	0.75
B	New Hire, Ph.D. Industrial Engineering	Assoc. Prof.	MYA	Fall 2023	9	0.75	1.00	0.75	9	0.75	1.00	0.75
B	New Hire, Ph.D. Industrial Engineering	Asst. Prof.	MYA	Fall 2023	9	0.75	1.00	0.75	9	0.75	1.00	0.75
B	New Hire, Ph.D. Industrial Engineering	Assoc. Prof.	MYA	Fall 2025	0	0.00	1.00	0.00	9	0.75	1.00	0.75
B	New Hire, Ph.D. Industrial Engineering	Assoc. Prof.	MYA	Fall 2025	0	0.00	1.00	0.00	9	0.75	1.00	0.75
	Total Person-Years (PY)							**3.41**				**5.40**

Faculty Code	Code Description	Source of Funding	PY Workload by Budget Classification Year 1		PY Workload by Budget Classification Year 5

APPENDIX A

Table 2

Anticipated Faculty Participation

A	Existing faculty on a regular line	Current Education & General Revenue	1.16		1.65
B	New faculty to be hired on a vacant line	Current Education & General Revenue	2.25		3.75
C	New faculty to be hired on a new line	New Education & General Revenue	0.00		0.00
D	Existing faculty hired on contracts/grants	Contracts/Grants	0.00		0.00
E	New faculty to be hired on contracts/grants	Contracts/Grants	0.00		0.00
F	Existing faculty on endowed lines	Philanthropy & Endowments	0.00		0.00
G	New faculty on endowed lines	Philanthropy & Endowments	0.00		0.00
H	regular/tenure-track line course load	Enterprise Auxiliary Funds	0.00		0.00
		Overall Totals for	**3.41**		**5.40**

APPENDIX A

TABLE 3A
ENROLLMENT AND GROWTH
PROJECTED COSTS AND FUNDING SOURCES

Institutions should not edit the categories or budget lines in the table below. This table is specific to state-funded (E&G) programs, and institutions are expected to explain all costs and funding sources in Section VII.A. of the proposal. Detailed definitions for each funding category are located at the bottom of the table.

Budget Line Item	Reallocated Base* (E&G) Year 1	Enrollment Growth (E&G) Year 1	New Recurring (E&G) Year 1	New Non-Recurring (E&G) Year 1	Contracts & Grants (C&G) Year 1	Philanthropy/ Endowments Year 1	Other Funding Year 1 - Please Explain in Section VII.A. of the Proposal	**Subtotal Year 1**	Continuing Base** (E&G) Year 5	New Enrollment Growth (E&G) Year 5	Other*** (E&G) Year 5	Contracts & Grants (C&G) Year 5	Philanthropy/ Endowments Year 5	Other Funding Year 5 - Please Explain in Section VII.A. of the Proposal	**Subtotal Year 5**
Salaries and Benefits (Faculty)	0	0	422,195	0	0	0	0	**$422,195**	696,706	0	0	0	0	0	**$696,706**
Salaries and Benefits (A&P and USPS)	0	0	114,096	0	0	0	0	**$114,096**	120,942	0	0	0	0	0	**$120,942**
OPS (including assistantships & fellowships)	0	0	10,200	0	0	0	0	**$10,200**	13,600	0	0	0	0	0	**$13,600**
Programmatic Expenses****	0	0	254,521	0	0	0	0	**$254,521**	544,213	0	0	0	0	0	**$544,213**
Total Costs	**$0**	**$0**	**$801,012**	**$0**	**$0**	**$0**	**$0**	**$801,012**	**$1,375,461**	**$0**	**$0**	**$0**	**$0**	**$0**	**$1,375,461**

*Identify reallocation sources in Table 4.
**Includes recurring E&G funded costs ("reallocated base," "enrollment growth," and "new recurring") from Years 1-4 that continue into Year 5.
***Identify if non-recurring.
****include library costs, expenses, OCO, special categories, etc.

Faculty and Staff Summary

Total Positions	Year 1	Year 5
Faculty (person-years)	3.41	5.40
FTE (A&P and USPS)	2.85	3.1

Calculated Cost per Student FTE

	Year 1	Year 5
Total E&G Funding	$801,012	$1,375,461
Annual Student FTE	18	71
E&G Cost per FTE	$ 44,500.67	$ 19,372.69

Table 3 Column Explanations		
Reallocated Base* (E&G)	1	E&G funds that are already available in the university's budget and will be reallocated to support the new program. Please include these funds in the Table 4 – Anticipated reallocation of E&G funds and indicate their source.
Enrollment Growth (E&G)	2	Additional E&G funds allocated from the "Student and Other fees Tust Fund" contingent on enrollment increases.
New Recurring (E&G)	3	Recurring funds appropriated by the Legislature to support implementation of the program.
New Non-Recurring (E&G)	4	Non-recurring funds appropriated by the Legislature to support implementation of the program. Please provide an explanation of the source of these funds in the budget section (section VII.A.) of the proposal. These funds can include initial investments, such as infrastructure.
Contracts & Grants (C&G)	5	Contracts and grants funding available for the program.
Philanthropy Endowments	6	Funds provided through the foundation or other Direct Support Organizations (DSO) to support the program.
Continuing Base** (E&G)	7	Includes the sum of columns 1, 2, and 3 over time.
New Enrollment Growth (E&G)	8	See explanation provided for column 2.
Other*** (E&G)	9	These are specific funds provided by the Legislature to support implementation of the program.
Contracts & Grants (C&G)	10	See explanation provided for column 5.
Philanthropy Endowments	11	See explanation provided for column 6.
Other Funding	12	Any funding sources not already covered in any other column of the table. Please provide an explanation for any funds listed in these columns in the narrative for Section VII.A. of the proposal.

APPENDIX A
TABLE 4
ANTICIPATED REALLOCATION OF EDUCATION GENERAL FUNDS*

Program and/or E&G account from which current funds will be reallocated during Year 1	Base before reallocation	Amount to be reallocated	Base after reallocation
Example: 555-555 World exploration fund (example)	0	0	$0
	0	0	$0
	0	0	$0
	0	0	$0
	0	0	$0
	0	0	$0
	0	0	$0
	0	0	$0
Totals	$0	$0	$0

*** If not reallocating E&G funds, please submit a zeroed Table 4**

Funds supporting the program come from unallocated E&G.

Appendix B. Academic Learning Compact

Florida Polytechnic University's Academic Learning Compact describes what students, who follow the major's study plan, will know and be able to do. These are listed as core student learning outcomes.

Program:	**Industrial Engineering**
Purpose of the Program:	The Industrial Engineering Bachelor of Science degree program at Florida Polytechnic University is designed to provide students core competencies areas such as logistics, operations research, manufacturing processes, as well as competency in areas of engineering project management and financial and managerial accounting. Industrial Engineers from Florida Poly will graduate with the knowledge and skill to enter industry successfully or continue their education at the graduate level.
Graduates of the program will demonstrate the following:	1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics. 2. an ability to 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. 3. an ability to communicate effectively with a range of audiences. 4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts. 5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives. 6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions. 7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Core Learning Outcomes:

Student Learning Outcomes	**The Outcomes Involve These Skills:**		
Upon completion of the Industrial Engineering Degree, students will possess:	**Content**	**Critical Thinking**	**Communication**
1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics		X	
2. an ability to 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	X		
3. an ability to communicate effectively with a range of audiences			X
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts		X	
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives	X		X
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions		X	
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.	X	X	

Appendix C. Faculty Vitae

Faculty vitae will be added upon submittal to the Board of Governors

Shahram Taj, Ph.D.

Professor of Logistics & Supply Chain Management
Chair, Department of Data Science and Business Analytics
Chair, Department of Computer Science
Florida Polytechnic University
Lakeland, Florida, USA

EDUCATIONAL QUALIFICATIONS

1984	Ph.D., Industrial Engineering and Operations Research University of Massachusetts
1980	M.S., Industrial Engineering University of Rhode Island
1977	B.S., Applied Mathematics and Operations Research College of Planning and Computer Applications, Tehran

(Extensive coursework in all functions of business: economics, management, marketing, finance, accounting, and business law)

HONORS AND AWARDS

2008-2013	Cameron Endowed Chair of Management and Marketing, Cameron School of Business, University of St. Thomas, Houston, Texas
2004	MPD Pride Award of Academic Recognition in Master of Science in Product Development University of Detroit Mercy
1999	Franz Edelman Finalist Award- INFORMS Paper: Productivity on the fast track: simulation-based decision support system drives training, operations, and planning at Visteon Sterling Plant - Results $15.5 million capital savings and $2 billion profit increase
1993	Beta Gamma Sigma Chapter Award
1992	President's Award for Faculty Excellence University of Detroit Mercy

MAJOR ADMINISTRATIVE RESPONSIBILITIES

2021-Present	Chair, Department of Computer Science, Florida Polytechnic University
2018-present	Chair, Department of Data Science and Business Analytics, Florida Polytechnic University
2017	Academic Program Coordinator, Graduate Programs Academic Program Coordinator, Science & Technology Management

Florida Polytechnic University

2013-2016 Chair, Department of Management and Marketing
College of Management, Lawrence Technological University

2008-2013 Chair, Department of Management and Marketing
Cameron School of Business, University of St. Thomas

2006-2008 Director of International Programs
College of Business Administration, University of Detroit Mercy
Directing the EMBA Joint programs with Fu Jen Catholic University in Taiwan, overseas international business courses, and expansion of business programs in China.

2004-2007 Acting Director of the Executive MBA program
College of Business Administration, University of Detroit Mercy
My duties included benchmarking Executive MBAs, developing the new EMBA curriculum, scheduling/coordinating classes, and interview of graduate applicants

2002-2008 Academic Director of the Product Development Program
University of Detroit Mercy
As Academic Director my duties included updating curriculum, reviewing and admission of new graduate students, recruiting adjunct faculty, supervising the thesis work of master's degree students, and supervising research and teaching assistants

2002-2008 Discipline Coordinator of Decision Sciences
College of Business Administration, University of Detroit Mercy

1990-1998 Academic/Research Coordinator, Decision and System Sciences
College of Business Administration, University of Detroit Mercy
As Academic/Research Coordinator my duties included curriculum updates, developing new curricula, recruiting full-time and adjunct faculty, scheduling classes, mentoring junior faculty towards tenure and promotion, promoting research and publications among faculty, and selecting research assistants

ACADEMIC EXPERIENCE

2021-Present Chair, Department of Computer Science, Florida Polytechnic University

2018-present Chair, Department of Data Science and Business Analytics,
Florida Polytechnic University

2016-Present Professor of Logistics & Supply Chain Management
Department of Data Science and Business Analytics
Florida Polytechnic University

2013-2016 Professor and Chair
Department of Management and Marketing
College of Management, Lawrence Technological University

2008-2013	Cameron Endowed Chair of Management and Marketing Professor of Management Cameron School of Business, University of St. Thomas
1994-2010	Professor of Operations Management and Systems Optimization College of Business Administration, University of Detroit Mercy
2004	Visiting Professor of Operations Management Beijing International MBA Program, Peking University, China
1987-1994	Associate Professor, Operations Management and Systems Optimization College of Business Administration, University of Detroit Mercy
1984-1987	Assistant Professor, Department of Management Bernard Baruch College, The City University of New York
1982-1983	Research Associate, School of Management, University of Massachusetts Developed a Decision Support System for computing food plans for the USDA. The food plans are used by the USDA, U.S. Bureau of Labor Statistics, and the Food Stamp Program
1981-1983	Instructor, School of Management University of Massachusetts
1980-1982	Research Assistant, School of Management, University of Massachusetts Designed a User Controlled Database Management System for computing iron in meals for the USDA
1978-1980	Research Assistant, Department of Industrial Engineering, University of Rhode Island Designed and implemented Health Care Information Systems for the University of Rhode Island Health Services (The system processes over 35,000 records annually)

MAJOR CONSULTING CONTRACTS

2009-2010	Baker Hughes Technical Advisor to Supply Chain Executives (VP levels)
2001-2006	Optimal Scheduling Solutions, L.L.C. Vice President of Product Development Consulting and overseeing software development for supply chain
1999-2000	Consortium of Marubeni, Japan High Comm, and PAC Senior Consultant Worked with Japanese, Australian, and American engineers/mangers in Australia and Japan in designing a new automotive high performance engine plant for GM/Holden in Australia

1998-2000	New Venture Gear (Joint Venture of GM and DaimlerChrysler) Executive Consultant in Simulation, Optimization, and Lean Manufacturing Worked directly with the executive vice president of worldwide operations in designing a new lean automotive power-train manufacturing plant in Germany –The lean production system design approach resulted in savings of $21 million.
1997-2000	Ford Motor Company, Sterling Axle Plant Senior Consultant in Simulation & Optimization Implementing lean manufacturing with a combination of new and existing facilities for gear manufacturing, – in cooperation with Dr. David Cochran at the Production Systems Design Laboratory at the Massachusetts Institute of Technology
1996-2000	Ford Motor Company, Sterling Axle Plant Senior Consultant in Simulation & Optimization Productivity improvement, optimizing, and design of assembly lines for axles - capital savings of $15.5 million, profit increase of $2 billion
1995-1996	Ford Motor Company, Sterling Axle Plant Senior Consultant in Simulation & Optimization Optimized and improved the design of slip-yoke manufacturing line that resulted in cost avoidance of $10.5 million, simulation and productivity improvement of the Driveshaft Business Unit identified about 250 excess daily labor hours due to batch operations, lack of coordination, unlimited WIP, and unavailability of accurate production data with potential annual cost savings of $2 million
1993-1994	Ford Motor Company, Romeo Engine Plant Faculty Intern Developed a simulation-based productivity training that became very successful and used at several other Ford's plants worldwide
1981-1982	Comcater International Inc Management Information System Consultant Developed commercial grade food/menu planning software

GRANTS

2019	$500,000 (REJECTED), NASA MUREP GRANT, Dr. Shahram Taj, Dr. Seyed Soltani, Dr. Jim Mennie and UCF
2007	$92,501, PI, Founding: MIOH-UTC (US Dept. of Transportation, Michigan DOT, Ohio DOT) Co-PIs: University of Detroit Mercy: Utpal Dutta University of Toledo: Subba Rao, Mark Vonderembse, and Paul Hong A collaborative Supply Chain/Transportation Efficiency Systems graduate degree program
2004	$3,000, PI, Founding: BiMBA, Peking University, China

	Assessing the State of Lean Manufacturing in China
2000	$15,000, PI, Funding: NSF Grant for PD21 Transfer the systems optimization curriculum for product development from MIT and develop relevant materials/application to the automotive industry
1999	$38,000, PI, Funding: NSF Grant for PD21 Transfer the operations management curriculum for product development from MIT and develop relevant materials/application to the automotive industry
1990	Summer Research Grant, University of Detroit Mercy Application of Mathematical Programming in Planning of Human Diets
1985	Summer Research Grant, Bernard Baruch College Bi-Criterion Quadratic Programming Model of the Diet Problem

PROFESSIONAL CONFERENCES AND TRAINING

- Department Chairpersons Workshop, Institute for Academic Leadership, the Florida State University, Howey-in-the-Hills, Florida, June 3-6, 2018. The agenda for this session included discussions on leadership; sustaining morale; departmental budgeting; teaching effectiveness; and goals and assessment.
- Department Chairpersons Workshop, Institute for Academic Leadership, the Florida State University, Howey-in-the-Hills, Florida, October 1-4, 2017.
- Leadership Development, Emily Rogers, Training Series 2018 (awarded certificate of completion)
- AACSB International Annual Accreditation Conference, St. Louis, September 22-24, 2013
- AACSB Continuous Improvement Conference, Atlanta, September 21-23, 2008
- AACSB International Conferences - “World Class Practices in Management Education” 21-22 May 2007, Beijing
- Lean for the Twenty-first Century Auto Industry, University of Michigan Japan Technology Management Program / Lean Enterprise Institute, Dearborn, May 1-3, 2000
- Value Stream Workshop, Ford-Visteon Chassis Division, April 12-14, 2000
- Education Consortium for Product Development, Massachusetts Institute of Technology, July 12-16, 1999
- Innovation in Product Development, Engineering/Manufacturing Conference, Massachusetts Institute of Technology, April 20-21, 1999
- Teaching Management Science with Spreadsheet, The Amos Tuck School of Business Administration, Dartmouth College, June 27- 30, 1998
- Ford Production System / Lean Manufacturing Design Rules, April 29-30, 1998
- Lean Manufacturing Workshop, by Dr. Cochran from MIT, April 20-21, 1998
- Taylor II Simulation Training, Sundance, Utah, 1995
- AACSB Continuous Improvement Symposium. St. Louis, Missouri, Sept., 1994
- Simulation Methodology Using Witness, HRDC, Ford Motor Company, July 21-23, 1993
- Teaching Business Ethics, Arthur Anderson, June 27 -28, 1991
- Quality, Productivity, and Competitive Position, by Dr. W. Edward Deming, Dearborn, Michigan, June 4-7, 1991

COURSES TAUGHT

Manufacturing Planning and Control
Logistics and Technology
Sustainable Logistics
Design Lab
Global Strategic Management
Operations Management and Supply Chain
Optimization and Simulation
Discrete Event Simulation
Global Supply Chain Management
Design and Management of Global Supply Chain
Management and Control of Operations and Quality
Lean Management
Systems Thinking - System Dynamics
Decision Analysis
Modeling and Executive Decision Analysis
Systems Optimization and Simulation
Simulation
Operations Research
Quantitative Methods for Decision Making
Management Information Systems
Introduction to Information Systems

CURRICULA DEVELOPMENT

Florida Polytechnic University

- Master of Science in Engineering – Engineering Management Track (2019)
- Master of Science in Computer Science – Data Science Track (2019)
- Curricula revisions for two degrees – BS in Data Science and BS in Business Analytics with concentrations in Big Data Analytics, Internet of Things, Health Informatics, Logistics and Supply Chain Management, Intelligent Mobility, and Quantitative Economics and Econometrics (2018)
- Revision of Logistics and Supply Chain Management (2017)
- Master of Science in Engineering – Concentration in Electrical Control Systems (2017)
- Master of Science in Engineering – Concentration in Robotics (2017)
- Master of Science in Innovation & Technology – Concentrations in Big Data Analytics and Logistics Analytics (2017)

Other Universities

- Proposal - Master of Science in System Engineering and Management (2012)
- Revision of Applied Strategic Management – MBA Capstone (2009)
- Sustainable Business Development – MBA elective (2009)
- System Dynamics – MBA elective (2009)
- Master of Science in Supply Chain/Transportation Efficiency Systems – This program has been developed with cooperation with the University of Toledo (2006-2007)
- Executive MBA – This cohort-based program is designed around nine cross-functional themes, (2005)
- Master of Science in Product Development - This cohort-based graduate program is based on the system design and management program/product development track at the Massachusetts Institute of Technology, developed in cooperation with Ford, General Motors, IBM, ITT, Polaroid, Xerox with funding from the NSF (1999)

- Master of Science in Software Management/Engineering (1991)

RESEARCH

In Progress

1. Planning and Executing Lean & Agile Manufacturing Facilities for Global Supply Chain
2. Rack Requirement Logistic Planning for Green Supply Chain
3. Supply Chain Optimization: MRP-Based Production Optimization – Multi-product, Multi-Plant, Hierarchy of tiers suppliers
4. Portfolio optimization modeling for social media advertising

Published Journal (Refereed) Article

1. Shahram Taj, Beena George, Priya Nath, and Adeyinka Adenrele "Sustainability and Business Model Innovation at the Bottom of the Pyramid: A Graduate Business Project" **Business Education Innovation Journal.** Vol. 8, No. 2, pp.13-20, 2016

2. Sarena Garcia-DeLeone and Shahram Taj, "A Business Model Designed to Tap into the Bottom of the Pyramid', **International Journal of Business, Marketing, and Decision Sciences.** Vol. 8, No. 1, pp.136-149, 2015.

3. Shahram Taj and Elham Mousavidin, "Using Discrete Event Visual Simulation to Teach Process Modelling in MBA Operations Management" **International Journal of Simulation and Process Modeling,** Vol. 10, No. 1, pp. 45-64, 2015

4. Shahram Taj, Souheil Badda, Sarena Garcia-DeLeone, and Beena George, "Morocco's Novatis Group: Diaper Manufacturing in a Developing Country", **Emerald Emerging Markets Case Studies**, Vol. 2. No. 8, pp. 1-11, 2012.

5. Shahram Taj, Hassan Shirvani, Bahman Mirshab, and Ahmet Zia, "Bank Efficiency in Turkey during the Recent Global Crisis", **Banks and Bank Systems Journal**, Vol. 7, No. 2, pp. 5-10, 2012.

6. Shahram Taj, Galia Novakova Nedeltcheva, George Pfeil, and Michael Roumaya, "A Spread-Sheet Model for Efficient Production and Scheduling of a Manufacturing Line/Cell", **International Journal of Production Research**, Vol. 50, No. 4, pp. 1141-1154, 2012.

7. Shahram Taj, Cyrus Motlagh, Mary Ann Hazen, and Cristian Morosan "Dependencies within Dimensions of Lean Manufacturing: Evidence from Chinese Manufacturing Plants", **International Journal of Operations and Quantitative Management,** Vol. 17, No. 4, pp. 279-302, 2011.

8. Shahram Taj, Hassan Shirvani and Bahman Mirshab A New Approach to Data Envelopment Analysis with an Application to Bank Efficiency in Turkey, **Banks and Bank Systems Journal**, Vol. 6, No. 1, pp. 42-47, 2011.

9. Shahram Taj and Cristian Morosan, "The Impact of Lean Operations on the Chinese Manufacturing Performance" **Journal of Manufacturing Technology Management,** Vol. 22, No. 1, pp. 223-240, 2011.

10. Cristian Morosan, Natalya Delcoure, Shahram Taj and Bahman Mirshab "An Exploratory Study of

the Factors that Influence MBA Students' Attitudes toward Their Areas of Concentration" International **Journal of Global Business Economics**, Vol. 3, No.2, pp.35-45, 2010.

11. Shahram Taj, "Data Envelopment Analysis for Lean Manufacturing," AT. Business Management Review, Vol.5, No. 3, pp.79-86, 2009.

12. Shahram Taj "Lean Manufacturing Performance in China - Assessment of 65 Manufacturing Plants", **Journal of Manufacturing Technology Management,** Vol. 19, No. 2, pp. 217-234, 2008.

13. Shahram Taj and Lismar Berro, "Application of Constrained Management and Lean Manufacturing in Developing Best Practices for Productivity Improvement in An Auto-Assembly Plant,", **International Journal of Productivity and Performance Management,** *Vol. 55 No. ¾, pp. 332-345, 2006.*

14. Shahram Taj, "Applying Lean Assessment Tools in Chinese Hi-Tech Industries", **Journal of Management Decision** - special issues on Chinese Management Vol. 43, No. 4, pp. 628-643, 2005.

15. Lilly Lancaster, Joseph Balintfy, and Shahram Taj, "Modeling the Supplementing of Human Diets," Socio-Economic Planning Sciences, The International Journal of Public Sector Decision-Making, Vol. 39, Issue 1, pp 1-10, 2005.

16. Bahman Mirshab, Shahram Taj, Beth Robinson, and Robin Schulz, "A Systematic Use of AHP as a Decision-Making Tool in the Product Development Cycle," Business Research Yearbook – Global Business Perspectives, **International Academy of Business Disciplines**, Volume IX, 2002.

17. George Pfeil, Ron Holcomb, Charles Muir, and Shahram Taj, "Visteon's Sterling Plant Uses Simulation-Based Decision Support in Training, Operations, and Planning," **Interfaces**, Vol 30, Jan.-Feb. 2000.

18. Shahram Taj, A. Hormozi, and B. Mirshab, "Academic Teaching and Industry Requirements: A Comparative Analysis," **Interfaces.** Vol. 26, No. 3, pp. 51-57, May-June 1996.

19. Joseph L. Balintfy, Sarah P. Rook, and Shahram Taj, "The Index of Decent Subsistence," **Socio-Economic Planning Sciences**, The International Journal of Public Sector Decision-Making, Vol. 30, No. 4, pp. 237-244, 1996.

20. Bahman Mirshab and Shahram Taj, "An Analysis of Federal Income Tax for the Decade of the 1980's", **Journal/Proceedings of Information Systems and Quantitative Methods**, Midwest Business Administration Association, Chicago, March 1995.

21. Lilly Lancaster and Shahram Taj, "The Cost of Decent Subsistence in Perspective," **Socio-Economic Planning Sciences**, The International Journal of Public Sector Decision-Making, Vol. 28, No. 2, pp. 121-131, 1994.

22. Shahram Taj, "A Mathematical Model for Planning Policies for Food Stamps," **Applications Of Management Science**, Vol. 7, 1993.

23. David Osborne and Shahram Taj, "Preventive Maintenance in a Multiple Shift, High Volume, Manufacturing Operation," **International Journal of Operations and Production Management**, Vol. 13, No. 10, 1993.

24. Amir Hormozi and Shahram Taj, "Manufacturing Issues in the 1990's and Plans for Actions," **Lead Article** in **Repetitive Manufacturing Reprints: Crucial Issues**. A. M. Hormozi, Editor, APICS, Falls Church, Virginia, 1992.

25. Harish Bahl, Shahram Taj, and Wayne Corcoran, "A Linear Programming Model Formulation for Optimal Product-Mix in Material Requirements Planning Environments," **International Journal of Production Research**, Vol. 29, No. 5, 1991.

26. Harish Bahl and Shahram Taj, "A Data-Dependent Implementation of Wagner-Whitin Algorithm for Lot Sizing," **Computers and Industrial Engineering**, Vol. 20, No. 2, 1991.

27. Hormozi, A.M. and Shahram Taj, "Manufacturing Issues in the 1990's and Plans for Actions," **Detroit Business Journal**, Vol. 4, No. 1, 1991.

28. Shahram Taj, "Application of Mathematical Programming in Planning of Human Diets," **Methods and Models of Operations Research (ZOR)**, Vol. 34, No. 5, 1990.

29. Mitzi Aronoff, Mohammed Dadashzadeh, and Shahram Taj "Decision Support for Regulatory Review Process in Flavor/Fragrance Industry," **Journal-Proceedings of Quantitative Management and Information Systems, Midwest Business Administration Association**, Chicago, March 1989.

30. Shahram Taj and Cleve E. Willis, "A Stepwise Procedure for Constrained Utility Maximization," **Decision Sciences**, Vol. 19, 1988.

31. Joseph L. Balintfy and Shahram Taj, "A Utility Maximization-Based Decision Support System for USDA Family Food Plans," **Applications of Management Science**, Vol.5, 1987.

Refereed Proceedings

32. Mustafa Ilhan Akbas and Shahram Taj, “Intelligent Mobility Concentration for Undergraduate Students in Data Science and Business Analytics”, Proceedings of the International Conference on Industrial Engineering and Operations Management Washington DC, USA, September 27-29, 2018.

33. Srikant Raghavan, Galia Novakova, and Shahram Taj, “Harnessing the Technology of Cloud Computing with Supply Chain Management”, International Conference on Operations Excellence and Service Engineering, IEOM Society, Orlando, Florida, September 10-11, 2015.

34. Galia Novakova, Kamen Spassov and Shahram Taj, “Superior Supply Chain Performance by Cloud Computing: Lessons Learned from SCM World, The 20th Asia Pacific Decision Sciences Institute Conference - APDSI July 2015, Hong Kong.

35. Sarena Garcia-DeLeone and Shahram Taj, “Reaching the BOP through “DIY” Apparel Kits: A Business Model Designed to Tap into the BOP” Proceedings of **2014 IABPAD conference,** Las Vegas**,** October.

36. Galia Novakova, Kamen Spassov and Shahram Taj, “Innovative Supply Chain Technologies for Management Decisions” Proceedings of **the 8th International Conference on Operations and Supply Chain Management** (ICOSCM 2014), July 18-22, 2014, Yokohama, Japan

37. Cristian Morosan, Natalya Delcoure, Shahram Taj and Bahman Mirshab “An Exploratory Study of the Factors that Influence MBA Students’ Attitudes toward Their Areas of Concentration” **Proceeding of the Annual Conference of the Global Business Development Institute**, Las Vegas, March 22-23, 2010.

38. Shahram Taj, “Lean Manufacturing in Chinese Garment Industry – Assessment of Five Manufacturing Plants,” Proceedings of **POMS Shanghai – The World of Operations Management Conference**, Shanghai, China June 19-23, 2006.

39. Guillermo Jimenez, Shahram Taj, and Jonathan Weaver, “Design for Testability”, **Proceedings of the NCIIA 9th Annual Meeting,** San Diego, March 17-19, 2005.

40. Jonathan Weaver, Shahram Taj, and Shahrooz Kamali “Assessment of A Graduate Program For End-To-End Product Creation," **Proceedings of the NCIIA 8th Annual Meeting**, San Jose, March 17-20, 2004.

41. Shahram Taj and Yalda Ghorashyzadeh, “Strategic Issues for Planning Manufacturing Plant/Facilities,” **Proceedings of the European Applied Business Research Conference**, Venice, Italy, June 10-15, 2003.

42. Lilly Lancaster, Joseph Balintfy, and Shahram Taj, “A Comparison of Mathematical Models for the Revised Thrifty Food Plan,” **Proceedings of Academy of Business Administration 2002 Global Business Trends Conference**, San Jose, Costa Rica, December 2002.

43. Lester Weitman, David Paddock, and Shahram Taj, “Minimizing Supply Chain Impact in a Synchronous Build Operation: Optimizing Buffer Size and Reducing Critical Lead Times,” **Proceedings of the IBEC 2002 – International Body Engineering Conference & Exhibition and Automotive & Transportation Technology Congress**, Paris, France, July 9-11, 2002.

44. William Ellegood, Shahram Taj, and Steve Hendricks, “Design of Volume Flexible Linked-Cell Production System for Capital Intensive Automotive Component,” **Proceedings of the Third World Congress on Intelligent Manufacturing Processes and Systems**, Cambridge, MA, June 28-30, 2000.

45. James Duda, Jose Castaneda-Vega, David Cochran, Mike Baur, Ron Anger, and Shahram Taj, “Application of a Lean Cellular Design Decomposition to Automotive Component Manufacturing System Design,” **Proceedings of The SAE International Automotive Manufacturing Conference & Exposition**, Detroit, May 11-13, 1999.

46. Shahram Taj, David Cochran, James Duda and Jochen Linck, “Simulation and Production Planning for Manufacturing Cells,” **Proceedings of the Winter Simulation Conference**, Washington, DC, Dec. 13-16, 1998

47. Shahram Taj, “Determining the Optimum Number of Pallets in a Closed-Loop Production Line,” **Proceedings of the National DSI Meeting**, Las Vegas, November 1998.

48. Shahram Taj, “Utility-Maximized Thrifty Food Plans for Food Stamp Program”, **Proceedings of the National Meeting of Decision Sciences Institute Meeting**, Orlando, November 1996.

49. Cyrus Motlagh and Shahram Taj, "Eating Healthy with Minimum Punishment of the Taste Buds: A Programming Approach," **Proceedings of Twenty Fourth Annual Meeting of Western DSI**, San Francisco, April 1995.

50. Cyrus Motlagh and Shahram Taj, "Diet for a Small Planet," **Proceedings of Twenty Sixth**

Annual Conference of Southwest DSI, Houston, March 1995.

51. Cyrus Motlagh and Shahram Taj, "Eating Healthier in the 90s: Do We have to Give Up All of Our Favorites", **Proceedings of Academy of Business Administration**, Reno, February 1995.

52. Shahram Taj, Bahman Mirshab, and Amir Hormozi, "The Views of Operations Managers and Academics on POM Courses," **Proceedings of the National Meeting of Decision Science Institute**, Honolulu, November 1994.

53. Shahram Taj, "Best-Buy Diet, "**Proceedings of the Northeast decision Sciences Institute Meeting**, Portsmouth, New Hampshire, April 1994.

54. Shahram Taj, Lilly Lancaster, and Bahman Mirshab, "A Methodological Approach of Estimating Food Utility Function," **Proceedings of the Academy of Business Administration**, Las Vegas, February,1994.

55. Shahram Taj, Bahman Mirshab, and Darren Murray, "A Status Report on the Industrial Management and Operations Management Undergraduate Course Offerings in United States," **Proceedings of Midwest Business Administration Association**, Chicago, March 1993.

56. Shahram Taj, David Osborne, and Amir M. Hormozi, "An Economic Break-Even Formula for Preventive Maintenance," **Proceedings of the National DSI Meeting**, Miami Beach, November 1991.

57. A.M. Hormozi and Shahram Taj, "Motivation for Automation," **Proceedings of the National DSI Meeting**, Miami, November 1991.

58. K.H. Yang, M. Alanis, and Shahram Taj, "Should Business School Teach Expert Systems?" **Proceedings of International Academy for Information Management**, East Rutherford, December 1991.
59. Dan Shoemaker, Shahram Taj, and Gregory Ulferts, "Implementation of a Software Engineering Curriculum in a Business School," **Proceedings of International Academy for Information Management**, East Rutherford, December 1991.

60. Shahram Taj and Bahman Mirshab “Developing Optimized Policy for Food Stamp," **Proceedings of the National Meeting of Decision Sciences Institute Meeting**, Miami Beach, November 1991.

61. Shahram Taj and Salah Khelfaoui, "A New Procedure for Estimating Quadratic Functions," **Proceedings of National DSI Meeting**, San Diego, November 1990.

62. Shahram Taj, "Application of the Utility Maximized Diet Model in Food Planning Policies," **Proceedings of the International Conference on Control and Modeling**, Tehran, July 1990.

63. Samuel J. Andrus and Shahram Taj, "An Empirical Investigation of Using Arbitrage Pricing Theory and Relative Strength in Portfolio Selection," **Proceedings of Midwest DSI Meeting, Minneapolis**, May 1990.

64. Harish Bahl, Bahman Mirshab and Shahram Taj, "An Investigation of Interaction Effects of Setting Due-Dates and Order Release Strategies on Performance of a Job Shop," **Proceedings of the Annual Meeting of National DSI**, New Orleans, Nov. 1989.

65. Harish Bahl and Shahram Taj, "Resource Allocation Decisions for Service Parts and Products in Material Requirements Planning," **Proceedings of the Midwest DSI Meeting**, Cincinnati, April

1989.

66. Shahram Taj, Bahman Mirshab, and Gregory W. Ulferts, "Application of Constrained Derivative Method on Derivation of the Food demand System with Energy Constraint," **Proceedings of the Midwest DSI Meeting**, Louisville, May 1988

67. Shahram Taj, Bahman Mirshab, and Harish Bahl, "A Decision Support System for Consumption-Production for Subsistence Farming," **Proceedings of the Western DSI Meeting**, Hawaii, March-April 1988.

68. Shahram Taj, "A New Econometric Model for Estimating the Quadratic Utility Function," **Proceedings of the Northeast DSI Meeting**, Atlantic City, 1987.

69. Shahram Taj, "Bi-Criterion Quadratic Programming Model of the Diet Problem," **Proceedings of the National DSI Meeting**, Honolulu, November 1986.

Thesis:

- Shahram Taj, "Formulation and Verification of a Quadratic Programming Model of the Diet Problem", Ph.D. Thesis, University of Massachusetts, 1984. Advisor: Dr. Joseph L. Balintfy

- Shahram Taj, "Design and Implementation of a New Computer-Based Out-Patient Information System at a University Health Services", Master's Thesis, University of Rhode Island, 1980.

CONFERENCE PRESENTATIONS AND INVITED TALKS

1. Shahram Taj, Distinguished Speakers, "Mission, Vision, Learning Outcomes, and Strategic Priorities for Data Science and Busyness Analytics", IEOM Global Business Management Education, March 11, 2021, 11th Annual International Conference on Industrial Engineering and Operations Management, Singapore, March 7-11, 2021 (Virtual)

2. Shahram Taj, Invited Talk and Session Chair and Organizer, "An Innovative Business Program - Business Analytics", IEOM Global Business Management Education, August 14, 2020, 5th North American International Conference on Industrial Engineering and Operations Management, Detroit, August 10-14, 2020 (Virtual)

3. FLORIDA POLY GLOBAL SCHOLARS TO BRAZIL – São Paulo, Sorocaba, March 20, 2019 to March 3, 2019. Presented two talks and one workshop:
    a. Business Model Innovation for the Bottom of Pyramid
        i. Presentation to MBA students – Travison University – Sao Paulo – March 20, 2019
        ii. Presentation at MAUA Institute of Technology, March 21, 2019
        iii. Presentation at FACEN, Sorocaba, March 23, 2019
        iv. Presentation at Sao Judas University, Sao Paulo, March 25, 2019
        v. Presentation at Belas Artes, Sao Paulo, March 28, 2019
    b. Planning and Executing Lean and Agile Manufacturing Facilities for Global Supply Chains
        i. Presentation at Sao Judas University, Sao Paulo March 26, 2019
    c. Workshop: Product Innovation for Bottom of Pyramid - Sao Judas University, March 27, 2019
4. Shahram Taj, Invited Talk about "Faculty and Academic Programs at FPU", 3rd FPU Annual Finance & Accounting Team Workshop Retreat at Bartow Executive Airport on Friday, May 24th, 2019.

5. Shahram Taj and Reinaldo Sanchez-Arias, "Innovative Undergraduate Degree Programs in Data

Science and Business Analytics". Presentation at the International Conference on Industrial Engineering and Operations Management Bangkok, Thailand, March 5-7, 2019.

6. FLORIDA POLY GLOBAL SCHOLARS TO BRAZIL – São Paulo, Sorocaba, March 31, 2018 to April 6, 2018. Presented three talks and participated in panels:
    a. Planning and Executing Lean and Agile Manufacturing Facilities for Global Supply Chains – FACEN https://youtu.be/Q_M2Ji9vA0w
    b. Big Data Analytics in Executing Global Supply Chain Strategy – Presentation and panel discussion – FACEN and FIAP https://youtu.be/XRlu_Giu4fk
    c. Higher Education in the US, Education Methodology – FACEN Leadership Team and Professors.
    d. How AI will change the world – FIAP Panels

7. Srikant Raghavan, Eric Wasiloff, and Shahram Taj, "Autonomous Vehicle Development & Deployment Strategies", Academy of Business Research Conference, New Orleans, March 23-25, 2016.

8. Shahram Taj, "Planning and Executing Manufacturing Facilities for Global Supply Chains" Distinguished Speaker, International Conference on Operations Excellence and Service Engineering, IEOM Society, Orlando, Florida, September 10-11, 2015. **(Invited)**

9. Shahram Taj, Hassan Shirvani, Bahman Mirshab, and Ahmet Zia, "Bank Efficiency in Turkey during the Recent Global Crisis", International conference on Banking, governance and regulation arranged by the Ukrainian Academy of Banking of the National Bank of Ukraine on May 24-25, 2012 in Ukraine. **(Invited)**

10. Cristian Morosan, Natalya Delcoure, Shahram Taj and Bahman Mirshab "An Exploratory Study of the Factors that Influence MBA Students' Attitudes toward Their Areas of Concentration" Annual Conference of the Global Business Development Institute, Las Vegas, March 22-23, 2010.

11. Shahram Taj, "A Collaborative Supply Chain/Transportation Efficiency Systems Graduate Degree Program", 12th International Symposium on Logistics – Sustainable Collaborative Global Supply Chains, Budapest, Hungry 8-10 July, 2007

12. Shahram Taj "Lean Manufacturing in China - Assessment of 65 Manufacturing Plants", **Invited Speaker**, Beijing International MBA program, Peking University, Beijing, May 19, 2007.

13. Shahram Taj, "Lean Manufacturing in Chinese Garment Industry – Assessment of Five Manufacturing Plants," POMS Shanghai – The World of Operations Management Conference, Shanghai, China June 19-23, 2006.

14. Shahram Taj, "Design of a Volume Flexible Linked-Cell Plant for Capital Intensive Automotive Components", **Invited Speaker**, Michigan Simulation User Group, 11th Annual Conference, Troy, October 18, 2005.

15. Guillermo Jimenez, Shahram Taj, and Jonathan Weaver, "Design for Testability", NCIIA 9th Annual Meeting, San Diego, March 17-19, 2005.

16. Jonathan Weaver, Shahram Taj, and Shahrooz Kamali "Assessment Of A Graduate Program For End-To-End Product Creation," NCIIA 8th Annual Meeting, San Jose, March 17-20, 2004.

17. Shahram Taj and Yalda Ghorashyzadeh, "Strategic Issues for Planning Manufacturing Plant/Facilities," European Applied Business Research Conference, Venice, Italy, June 10-15, 2003.

18. Lilly Lancaster, Joseph Balintfy, and Shahram Taj, “A Comparison of Mathematical Models for the Revised Thrifty Food Plan,” Academy of Business Administration 2002 Global Business Trends Conference, San Jose, Costa Rica, December 2002.

19. Lester Weitman, David Paddock, and Shahram Taj, “Minimizing Supply Chain Impact in a Synchronous Build Operation: Optimizing Buffer Size and Reducing Critical Lead Times,” IBEC 2002 – International Body Engineering Conference & Exhibition and Automotive & Transportation Technology Congress, Paris, France, July 9-11, 2002.

20. William Ellegood, Shahram Taj, and Steve Hendricks, “Design of Volume Flexible Linked-Cell Production System for Capital Intensive Automotive Component,” Third World Congress on Intelligent Manufacturing Processes and Systems, Cambridge, MA, June 28-30, 2000.

21. Shahram Taj, George Pfeil, Dick Sullivan, Jim Hutka, and David Cochran, “Designing a Factory with a Future in Mind,” Seventh Annual Meeting of the Production and Operations Management Society, San Antonio, April 1-4, 2000.

22. James Duda, Jose Castaneda-Vega, David Cochran, Mike Baur, Ron Anger, and Shahram Taj, “Application of a Lean Cellular Design Decomposition to Automotive Component Manufacturing System Design,” SAE International Automotive Manufacturing Conference & Exposition, Detroit, May 11-13, 1999.

23. Shahram Taj, David Cochran, James Duda and Jochen Linck, “Simulation and Production Planning for Manufacturing Cells,” Winter Simulation Conference, Washington, DC, Dec. 13-16, 1998.

24. Shahram Taj, “Determining the Optimum Number of Pallets in a Closed-Loop Production Line,” National DSI Meeting, Las Vegas, November 1998.

25. David Cochran, James Duda, Jichen Linck and Shahram Taj, “Design of Manufacturing Cells Using a Combination of New and Existing Equipment,” The 9th Annual Meeting of The Production and Operations Management Society, Santa Fe, March 28-31, 1998

26. Shahram Taj, “Utility-Maximized Thrifty Food Plans for Food Stamp Program”, National Meeting of Decision Sciences Institute Meeting, Orlando, November 1996.

27. Cyrus K. Motlagh and Shahram Taj, “Estimation of the Impact of the Baseball Strike on the Fans,” National Meeting of Decision Science Institute, Boston, November 1995.

28. Shahram Taj and Joseph L. Balintfy, “A New Approach to Food Price Indexing,” Meeting of INFORMS, New Orleans, October 29 - November 1, 1995.

29. Cyrus Motlagh and Shahram Taj, "Eating Healthy with Minimum Punishment of the Taste Buds: A Programming Approach," Twenty Fourth Annual Meeting of Western DSI, San Francisco, April 1995.

30. Cyrus Motlagh and Shahram Taj, "Health of America Optimized in Good Taste!" Joint National Meeting of TIMS/ORSA, Los Angeles, April 1995.

31. Cyrus Motlagh and Shahram Taj, "Diet for a Small Planet," Twenty Sixth Annual Conference of Southwest DSI, Houston, March 1995.

32. Cyrus Motlagh and Shahram Taj, "Eating Healthier in the 90s: Do We have to Give Up All of Our

Favorites", Academy of Business Administration, Reno, February 1995.

33. Shahram Taj, "Applications of Computer-Based Interactive-Visual Simulation in Productivity Training," Presentation at Institute for Research in Planning and Development, Tehran, December 20, 1994.

34. Shahram Taj, "Simulation Use in Productivity Training," General Membership Meeting of the Michigan Simulation User Group, November 30, 1994.

35. Shahram Taj, Bahman Mirshab, and Amir Hormozi, "The Views of Operations Managers and Academics on POM Courses," National Meeting of Decision Science Institute, Honolulu, November 1994.

36. Dan Shoemaker, James Miteff, and Shahram Taj, "Improving Information Systems Design and Development in a Relational Environment," Joint National Meeting of ORSA/TIMS, Detroit, October 1994.

37. Shahram Taj and Vahid Lotfi, "An Extended LP Formulation for MRP Problems," Joint National Meeting of ORSA/TIMS, Detroit, October 1994.

38. Shahram Taj, "Best-Buy Diet, " Northeast decision Sciences Institute Meeting, Portsmouth, New Hampshire, April 1994.

39. Shahram Taj, Lilly Lancaster, and Bahman Mirshab, "A Methodological Approach of Estimating Food Utility Function," Academy of Business Administration, Las Vegas, February,1994.

40. Shahram Taj, Lilly M. Lancaster, and Joseph L. Balintfy, "The Effect of Adding Dietary Supplements to the Food Stamp Program," Joint National Meeting of ORSA/TIMS, Phoenix, November 1993.

41. Shahram Taj, Bahman Mirshab, and Darren Murray, "A Status Report on the Industrial Management and Operations Management Undergraduate Course Offerings in United States," Midwest Business Administration Association, Chicago, March 1993.

42. Joseph L. Balintfy, Lilly M. Lancaster, and Shahram Taj, "Modeling Advancement in Diet and Menu Planning," Joint National Meeting of ORSA/TIMS, San Francisco, November 1992.

43. Lilly M. Lancaster, and Shahram Taj, "Computational Experience with the Cost of Decent Subsistence," Joint National Meeting of ORSA/TIMS, Orlando, April 1992.

44. K.H. Yang, M. Alanis, and Shahram Taj, "Should Business School Teach Expert Systems?" International Academy for Information Management, East Rutherford, December 1991.
45. Dan Shoemaker, Shahram Taj, and Gregory Ulferts, "Implementation of a Software Engineering Curriculum in a Business School," International Academy for Information Management, East Rutherford, December 1991.

46. Shahram Taj, David Osborne, and Amir M. Hormozi, "An Economic Break-Even Formula for Preventive Maintenance," National DSI Meeting, Miami Beach, November 1991.

47. A.M. Hormozi and Shahram Taj, "Motivation for Automation," National DSI Meeting, Miami, November 1991.

48. Shahram Taj and Bahman Mirshab, “Developing Optimized Policy for Food Stamp," National Meeting of Decision Sciences Institute Meeting, Miami Beach, November 1991.

49. K.H. Yang and Shahram Taj, "Study of Expert Systems Benefits and User Satisfaction, " Joint National Meeting of ORSA/TIMS, Nashville, May 1991.

50. Shahram Taj and Salah Khelfaoui, "A New Procedure for Estimating Quadratic Functions," National DSI Meeting, San Diego, November 1990.

51. Shahram Taj, "Application of the Utility Maximized Diet Model in Food Planning Policies," International Conference on Control and Modeling, Tehran, July 1990.

52. Shahram Taj, "Planning of Human Diets in the Third World Countries," 12th Triennial Conference on Operations Research, IFOR, Athens, June 1990.

53. Samuel J. Andrus and Shahram Taj, "An Empirical Investigation of Using Arbitrage Pricing Theory and Relative Strength in Portfolio Selection," Midwest DSI Meeting, Minneapolis, May 1990.

54. Harish Bahl, Shahram Taj and Bahman Mirshab, "Simulation of Managerial Decisions on Job Shops," Joint National Meeting of TIMS/ORSA, Las Vegas, May 1990.

55. Bahram Mirshab, Bahman Mirshab and Shahram Taj, "Self-Learning Expert Systems," Joint National Meeting of TIMS/ORSA, Las Vegas, May 1990.

56. Harish Bahl, Bahman Mirshab and Shahram Taj, "An Investigation of Interaction Effects of Setting Due-Dates and Order Release Strategies on Performance of a Job Shop," Annual Meeting of National DSI, New Orleans, Nov. 1989.

57. Shahram Taj, Bahl, H. and W.A. Corcoran, "A LP Model for Product Mix Decision in MRP Environment," Joint National Meeting of CORS/TIMS/ORSA, Vancouver, Canada, May 1989.

58. Harish Bahl and Shahram Taj, "Resource Allocation Decisions for Service Parts and Products in Material Requirements Planning," Midwest DSI Meeting, Cincinnati, April 1989.

59. Shahram Taj, "Utility Maximization: Food Planning and Portfolio Problems using the Balance Sheet," Feature Speaker, Southern Michigan Joint Chapter of ORSA/TIMS, November 1988.

60. Shahram Taj, Bahman Mirshab, and Gregory W. Ulferts, "Application of Constrained Derivative Method on Derivation of the Food demand System with Energy Constraint," Midwest DSI Meeting, Louisville, May 1988

61. Lilly M. Lancaster and Shahram Taj, "Econometric Evidence for a Quadratic Utility Function behind Food Purchasing Decisions," Joint National Meeting of ORSA/TIMS, Washington D.C., April 1988.

62. Shahram Taj, Bahman Mirshab, and Harish Bahl, "A Decision Support System for Consumption-Production for Subsistence Farming," Western DSI Meeting, Hawaii, March-April 1988.

63. Shahram Taj, "A Utility Maximization-Based Decision Support System for USDA Family Food Plans," Feature Speaker, Southern Michigan Joint Chapter of ORSA/TIMS, December 1987.

64. Shahram Taj, "A New Econometric Model for Estimating the Quadratic Utility Function," Northeast DSI Meeting, Atlantic City, 1987.

65. Shahram Taj, "Bi-Criterion Quadratic Programming Model of the Diet Problem," National DSI

Meeting, Honolulu, November 1986.

66. Shahram Taj, "Application of Constrained Derivative Method on the Derivation of Demand Systems," Joint National Meeting of ORSA/TIMS, Los Angeles, April 1986.

67. Shahram Taj, "Methods of Estimating Positive (Negative) Definite (Semi-Definite) Hessian Matrices of Quadratic Programming Problems," 12th International Symposium on Mathematical Programming, Boston, August 1985.

68. Shahram Taj, "Stepwise Procedure for Estimating the Coefficients of Quadratic Programming Problem," Joint National Meeting of ORSA/TIMS, Boston, April-May 1985.

69. Joseph L. Balintfy and Shahram Taj, "A Utility Maximization Approach to USDA Family Food Plans," Invited Speaker, Tenth Triennial Conference on Operations Research, IFOR, Washington D.C., August 1984.

70. Joseph L. Balintfy and Shahram Taj, "A Utility Maximizing Approach to USDA Family Food Plans," Joint National Meeting of ORSA/TIMS, San Francisco, May 1984.

71. Shahram Taj, "Estimation of Coefficients in a Quadratic Programming Problem," Joint National Meeting of ORSA/TIMS, Orlando, November 1983.

GRADUATE THESES/PROJECTS

Doctoral Students:

1. Hayder R. Zghair, Intelligent Heuristic Optimization of Flexible Automated Manufacturing Systems Using Artificial Networks and Computer Simulations, ***Doctor Engineering in Manufacturing Systems, Lawrence Technological University, January 2018.*** (Member of Thesis Committee)

2. Saso Krstovski, Optimization of an Asynchronous Manufacturing Production System Incorporating Mixed Operational Cycle Time Variation, ***Doctor of Engineering in Manufacturing Systems, Lawrence Technological University, March 2018.*** (Member of Thesis Committee)

3. James W. Duda, A Decomposition-Based Approach to Linking Strategy, Performance Measurement, and Manufacturing System Design, ***Ph.D. Thesis in Mechanical Engineering, Massachusetts Institute Technology, 2000***. (Member of Thesis Committee)

Master Students Theses/Projects:

4. Maria Paula Gomez Tatum, “Improvement of Overall Equipment Effectiveness Applying Lean Six Sigma (Dmaic) Approach in a Power Plant”, Completed as a requirement for ***Master of Science in Computer Science Big Data Analytics at Florida Polytechnic University, Spring 2021.*** (Project Advisor).

5. Morgan Nibert, “Cross-Platform Content Recommendation System Using Sentiment Analysis of Microblogging Data”, Completed as a requirement for ***Master of Science in Computer Science Data Science Track at Florida Polytechnic University, Spring 2021.*** (Committee Member)

6. Richard Truncle, “Developing a Framework and Guidelines for Successful CRM & Marketing Automation Implementation for a Small-To-Medium Size Company with Limited Resources”, Completed as a requirement for ***MS in Innovation & Technology - Data Analytics, Florida***

Polytechnic University, Spring 2020. (Project Advisor)

7. Kiran Kumar Dandu, “Downstream Optimization Model for Bulk Distribution in Fertilizer Industry”, Completed as a requirement for ***MS in Innovation & Technology - Data Analytics, Florida Polytechnic University, January 2019.*** (Project Advisor)

8. Bradley Gresens, James Kuiken, Ethan Le, and Joseph Prior “Proposal for Standardization of Communication of Safe Extrication Procedures of Automotive Accident Victims to Rescue Workers”, Master ***Thesis in Product Development, University of Detroit Mercy, December 2007*** (Thesis Reader)

9. Sam Abihana, Ion Furtuna, Adithya Rajagopal, “GPS Based Vehicle Speed Control”, ***Master Thesis in Product Development, University of Detroit Mercy, Feb. 2007*** (Thesis Reader)

10. Mark Bestauros, Michael Deegan, John Karl, and Fred Michael, ‘’Intelligent Power Supply systems Engineering”***, Master Thesis in Product Development, University of Detroit Mercy, December 2005*** (Thesis Reader)

11. Darryl Harris, Evaluation of a Consumer Product Development and Optimization of Non-Pneumatic Off-The-Road Tire/Wheel Assembly, Master ***Thesis in Product Development, University of Detroit Mercy, April 2005*** (Thesis Principal Advisor)

12. Mike Druchunas, Charles J. McCarthy, Mark Mieloch, and Thang Tran, Upper Body CAD Development Process, Global Product Development System, Master ***Thesis in Product Development, University of Detroit Mercy, April 2005*** (Thesis Reader)

13. Richard Doroba, Application of Concept Generation Tools and Set-Based Concurrent Engineering for Automotive Fuel Cell Vehicle, ***Master Thesis in Product Development, University of Detroit Mercy, April 2005*** (Thesis Reader)

14. Bilal Ahmed and Mark Blake, Use of a Decision Support Tool in the Selection of a Hydrogen Harvest Method in the State of California, ***Master Thesis in Product Development, University of Detroit Mercy, March 2005*** (Thesis Principal Advisor)

15. Vikas Bhatt, Inderpal Deol, Sudhakar Varshney, and Sai Vummethala, Pre-Delivery Optimization. ***Master Thesis in Product Development, University of Detroit Mercy, March 2005*** (Thesis Principal Advisor)

16. Michael Filipovich, Terry Sizemore, and Luyan Wang, Powertrain Mount Design and Development: A Systems Approach. ***Master Thesis in Product Development, University of Detroit Mercy, March 2005*** (Thesis Reader)

17. Mathew Brooke, Jesus Cardoso, John Jorgensen, and Erik Ranka, Comparative Analysis of Hybrid Electric Vehicle (HEV) Architecture. ***Master Thesis in Product Development, University of Detroit Mercy, February 2005*** (Thesis Reader)

18. Moe Fawaz, Michael Vinarcik, and Susan Wellman-Smith, A Decision Support System for Concept Selection Using Pugh’s Total Design Approach. ***Master Thesis in Product Development, University of Detroit Mercy, December 2004*** (Thesis Reader)

19. Donald Lawrence, Evaluation of Consumer Product Development and Implementation Effort. ***Master Thesis in Product Development, University of Detroit Mercy, November 2004***

(Thesis Principal Advisor)

20. Franco Amendola, Michael Gabel, Ricardo Hernandez, and Gutierrez, Alberto, Cost-Effective Manufacturing for Next Generation Steering Gear. ***Master Thesis in Product Development, University of Detroit Mercy, 2003*** (Thesis Principal Advisor)

21. Bruce Michel, Michael Semke, Duane Stirmemann, and Cory Wurtzbacher, Manufacturing/Product Plan for Low Volume Power Transfer Units for Visteon Corporation. ***Master in Product Development, University of Detroit Mercy, 2003*** (Thesis Principal Advisor)

22. Jac Fox, Jamal Kanso, Farouk Mohamed, and Joe Provenzano, Improving the Quality and Execution of the Ford Product Development System (FPDS) between the Surface Transfer (ST) and the Confirmation Prototype (CP) Milestones. ***Master Thesis in Product Development, University of Detroit Mercy, 2003*** (Thesis Principal Advisor)

23. Nigel Brroks, Jeffrey Duncan, and Al Paul, The D219/258 Door Module Design Process. ***Master Thesis in Product Development, University of Detroit Mercy, 2003.*** (Thesis Principal Advisor)

24. Steve Aidenbaum, Erik Wippler, and Lismar Berro, Dearborn Assembly Plant Mustang Rear Pan Line Constraint. ***Master Thesis in Product Development, University of Detroit Mercy, 2003*** (Thesis Principal Advisor)

25. Esad Kaknjo and Medina Kaknjo, Triton SmartFeed Fish Food Dispenser - Prototype Design and Development, Marketing and Financial Analysis. ***Master Thesis in Product Development, University of Detroit Mercy, 2003.*** (Thesis Principal Advisor)

26. Paul Deniston, Al Dobryden, and Tyrone Hamilton, Automotive Product Development System Implications of Powertrain Reuse. ***Master Thesis in Product Development, University of Detroit Mercy, 2003.*** (Thesis Reader)

27. Ryan Hazel and Steve McElmeel, Improve Virtual Vehicle Verification Documentation During the Product Development Process. ***Master Thesis in Product Development, University of Detroit Mercy, 2003.*** (Thesis Reader)

28. Mark Brown, Iraj Dasger, and Daniil Rapoport, System Engineering Approach Applied to the Critical Linkages within an Automotive Liftgate System. ***Master Thesis in Product Development, University of Detroit Mercy, 2003.*** (Thesis Reader)

29. Mark Colleti, BJ Dodds, Scott St. Laurent, and Sean West, Design & Development of a High-Speed Off-Road Recreational Truck Using the Product Development Process***. Master Thesis in Product Development, University of Detroit Mercy, 2003.*** (Thesis Reader)

30. Bin Du andTom White, Triton SmartFeed Fish Food Dispenser - Logic Circuit Design and Development E-Business and Patent. ***Master Thesis in Product Development, University of Detroit Mercy, 2003.*** (Thesis Reader)

31. William Woodham, An Alternative Vehicle Architecture. ***Master Thesis in Product Development, University of Detroit Mercy, 2003.*** (Thesis Reader)

32. Jim Gregoire, Guillermo Jimenez, Robert Ognjanovski, and Robert Spinks, Improving the Product Development Process with an Emphasis on Testing and Validation of Automotive Electronics. ***Master Thesis in Product Development, University of Detroit Mercy, 2002.*** (Thesis Principal Advisor)

33. Julie Earle, David Herczeg, and James Van Gilder, The Effectiveness of Systems Engineering in Ford Product Development. ***Master Thesis in Product Development, University of Detroit Mercy, 2002.*** (Thesis Reader)

34. Bill Mansur and James Reefe, Application of the Ford Product Development System Using System Engineering to Optimize Process to Develop Powertrain Control System Using MAF Sensor. ***Master Thesis in Product Development, University of Detroit Mercy, 2002.*** (Thesis Reader)

35. Jennifer Aittama, Joshua Halliburton, Michael Hunt, and Jennifer Margherita, Leveraging Tools and Process into a Best Practice Procedure to Streamline the Automotive Theme Development Process***. Master Thesis in Product Development, University of Detroit Mercy, 2002.*** (Thesis Reader)

36. Catherine Campbell, Brandon Johnson, Robbin McDaniel, and Britt Scott, Optimization of the GAP Strategy Utilizing Design Structure Matrix (DSM) Methods – A System Engineering Approach. ***Master Thesis in Product Development, University of Detroit Mercy, 2002.*** (Thesis Reader)

37. Gary Crane, Analysis and Resolution of Headlamp Water Intrusion Issue. ***Master Thesis in Product Development, University of Detroit Mercy, 2002.*** (Thesis Reader)

38. Ron Anger, Seamus Clark, Scott Leonardi, and Gary Meyers, Design and Analysis of Lean Gear Manufacturing. ***Master Thesis in Product Development, University of Detroit Mercy, 2001.*** (Thesis Principal Advisor)

39. David Paddock and Lester Weitman, A holistic Approach to Production Optimization as Applied to Vehicle Paint Operations. ***Master Thesis in Product Development, University of Detroit Mercy, 2001.*** (Thesis Principal Advisor)

40. Tom Boettcher, Al Figlioli, and John Rinke, Applying Lean Manufacturing Philosophies to Transmission Final Assembly. ***Master Thesis in Product Development, University of Detroit Mercy, 2000.*** (Thesis Principal Advisor)

41. Tom Klauke, Steve Rollinger, Mark Savoury, and Phat Tran, POMnext – Prototype Optimization Model and Extended Application Tool to Help Establish Realistic Targets for Vehicle Program Metrics, Based on Program Change.***Master Thesis in Product Development, University of Detroit Mercy, 2000.*** (Thesis Principal Advisor)

42. Gregory Heald, Using Simulation for the Trim and Chassis Line for a Future Minivan. ***MBA Independent Study, University of Detroit Mercy,*** **1993.**

43. David Osborne, An Economic Break-Even Formula for Preventive Maintenance Functions in a Multiple Shift-High Volume, Manufacturing Operation. ***MBA Independent Study, University of Detroit, 1990.***

44. Samuel J. Andrus, An Empirical Investigation of Using Arbitrage Pricing Theory and Relative Strength in Portfolio Selection. ***MBA Independent Study, University of Detroit, 1989.***

PROFESSIONAL SERVICE

Book Review

1. Quantitative Analysis for Business Decisions, Irwin, August 1994

2. Production/Operations Management, Houghton Mifflin Company, June 1992

3. Production/Operations Management: Computer Integrated Systems, Houghton Mifflin Company, April 1990
4. Quantitative Analysis/Management Science, Richard D. Irwin, Inc. November 1989

5. Organizational Information System: A Managerial Approach, Random House Inc., May 1986

Paper Review

Journals:

Journal of Manufacturing Technology Management
International Journal of Simulation and Process Modelling
International Journal of Production Economics
International Journal of Operations & Production Management
Interfaces
Decision Sciences
Editorial Board Member, Detroit Business Journal, 1990-1992

Professional Meetings:

Winter Simulation
DSI National Meetings
Northeast DSI Meeting

Test Writer

Item writer for the Regents College Examination in Production/Operations Management

Professional Societies (Past Participation)

INFORMS
APICS
The Decision Science Institute
Charter Member, TIMS College on Production and Operations Management

Track Chairperson

- Body Assembly and Manufacturing, IBEC 2002 – International Body Engineering Conference & Exhibition and Automotive & Transportation Technology Congress, Paris, France, July 9-11, 2002
- Lean Manufacturing, Manufacturing Information Management, Supply Chain, and Product Development, SAE International / Automotive & Transportation Technology Congress and Exhibition, Barcelona, Spain, October 1-3, 2001. (Also served as the Chair of the Award Committee)

- Advanced Manufacturing, Modular Manufacturing, Supplier Integration, and Production Planning, ISATA 2000: Automotive & Transportation Technology, Dublin, Ireland, September 25-27, 2000

Proceedings Editor

David Gonsalvez, Yves Mille, and Shahram Taj – Track Co-Chairs, ISATA 2000- Automotive & Transportation Technology, Advanced Manufacturing – Modular Manufacturing, Supplier Integration, and Production Planning**,** Dublin, Ireland, September 25-27, 2000

Session Chairperson

- Session Chair and Organizer, IEOM Global Business Management Education, August 14, 2020, 5th North American International Conference on Industrial Engineering and Operations Management, Detroit, August 10-14, 2020 (Virtual).
- Global Engineering Education International Conference on Industrial Engineering and Operations Management Washington DC, USA, September 27-29, 2018.
- National Decision Sciences Institute Meeting, Orlando, November 1996
- National Decision Sciences Institute Meeting, Washington, D.C., November 1993
- National Decision Sciences Institute Meeting, Miami Beach, November 1991
- Joint National Meeting of ORSA/TIMS, Boston, April 1985

Community

- Member of Advisory Board, Lakeland Regional Health and Florida Polytechnic University, 2018 – 2019.
- Participated at several meeting of the Financial Education Institute, Detroit, 2013-2014
- Participated at several meeting of the Council on Foreign Relations, Houston, 2008-2009
- Participated at several meeting of the Council on Foreign Relations, Houston, 2008-2012
- Participated at several meeting of the Financial Education Institute, Houston, 2008-2011
- Michigan-Ohio University Transportation Center Operating Committee, 2006 - *2007*
- Participated at the Detroit Chapter of The American Production and Inventory Control Society, 1990-1992
- Selected as a member of a high-level United Nations delegation of university professors to visit Iran, the delegation subsequently met with and advised top level government and industry officials including vice-presidents and other cabinet members in regard to economic planning and possible cooperation between institutions of higher education in Iran and the United States, 1991
- Participated at the Detroit Chapter of American Society for Quality Control, 1988-1990

UNIVERSITY SERVICE

Florida Polytechnic University

- Member of the DSBA Reappointment and Promotion Clarifications, 2019 – present
- Chair, Program Evaluation Panel for Data science and Business Analytics, 2020 - present
- Member, University Evaluation Committee, 2020 – Present
- Member of SAM's Program Evaluation Panel, 2020.
- Chair of the Economic Impact Committee and member of the Leadership Team, 2018 - present
- Member, Academic Policies and Procedure Committee, 2017 - present
- Member of the Search Committee for Computer Science (S3), 2018-2019
- Member of the Search Committee for Mechanical Engineering, 2018-2019
- Member of the Search Committee for Math Associate Professor, 2018-2019

- Member of the University Student Technology Fee Committee, 2018-2019
- Chair, Graduate Study Committee, 2017-2018
- Member, Undergraduate Curriculum Committee, 2016- 2018
- Co-Chair of Dept. Curriculum Committee, 2017-2018
- Member, Data Analytics and STM Search Committee, 2017- 2018
- Member, Special Task Force Committee to update the Faculty Handbook, 2016

Lawrence Technological University

- Department Chair, Management and Marketing, 2013-2016
- Chair, Faculty Search Committee, College of Management, 2013-2016
- Chair, Faculty Development Committee, College of Management, 2014-2016
- Member, Assessment Committee, College of Management, August 2013-2016
- Member, Strategic Planning Committee, College of Management, August 2015-2016
- Member, Faculty Development Committee, College of Management, August 2013-2014
- Member, AACSB Advisory Committee, College of Management, August 2013-2016
- Member, Math Task Force, University, Spring 2015-2016

University of St. Thomas

- Department Chair, Management and Marketing, August 2008- December 2012
- Faculty Development Committee, Cameron School of Business, 2008-2013
- Cameron School of Business Council, 2008-2013

University of Detroit Mercy

- College of Business Faculty Development Committee, 2004 - 2008
- College of Business Graduate Curriculum Committee, 1997- 2008
- College of Business Assessment and Standard Committee, 2004 - 2007
- College of Business Administration Dean’s Search Committee, 2006
- Prioritization Process Steering Committee, 2001-2002
- Search Committee for Academic Vice President and Provost, 1999-2000
- Engineering Management Curriculum Committee, College of Engineering, 1991-1999
- College of Business Faculty Development Council, 1991-1998
- College of Business Tenure and Promotion Committee, 1988-1990, 1992-1993, 1994-1995
- Chairman of the College of Business Administration's Selection Committee for the Faculty Award for Excellence, 1990-1991, 1992-1993
- College of Business Student Grievance Committee, 1992-1993
- University Faculty Development Committee, 1992-1993
- Insignis Interview, 1990-1991
- Co-chaired the curriculum development in the field of MIS and CIS for the consolidated College of Business Administration, 1990-1991
- College of Business Professional Development Committee, 1990-1991
- University Selection Committee for the Faculty Award for Excellence, 1990-1991
- College of Business Planning Committee, 1988-1991
- Professional Negotiating Committee, 1989-1990
- Faculty Marshal at the University Commencement, 1991

RESEARCH INTERESTS

Business Model Innovation, sustainable business development, global supply chain design, production system design, productivity improvement, lean operations, optimizing human diets

MARY B. VOLLARO, Ph.D.

mvollaro@flpoly.org **863.874.8604**

EDUCATION

Ph.D. in Materials Science, Field of Metallurgy, May 1996
UNIVERSITY OF CONNECTICUT, Storrs, CT
Dissertation: Phase Formation, Microstructures, and Electrical Properties of Ni-Cr Films
Advisor: Dr. Donald I. Potter

M.S. in Metallurgy, 1986
RENSSELAER POLYTECHNIC INSTITUTE
The Hartford Graduate Center, Hartford, CT

B.S. in Mechanical Engineering, 1983
WESTERN NEW ENGLAND COLLEGE, Springfield, MA

PROFESSIONAL EXPERIENCE

Associate Professor, Mechanical & Industrial Engineering Aug '16 - present
FLORIDA POLYTECHNIC UNIVERSITY, Lakeland, FL

Associate Professor, Mechanical Engineering Aug '04- May '16
Assistant Professor, Mechanical Engineering Sept '98 – Aug '04
Assistant Professor of Engineering (Visiting) Sept '97 –Aug '98
WESTERN NEW ENGLAND UNIVERSITY, Springfield, MA

Assistant Professor (adjunct) Summer '97
FAIRFIELD UNIVERSITY, BEI School of Engineering, Fairfield, CT

Research Scientist Feb '96 – Aug '97
ADVANCED TECHNOLOGY MATERIALS, INC., Danbury, CT

Graduate Research Assistant / Teaching Assistant June '89 –Apr '96
UNIVERSITY OF CONNECTICUT, Storrs, CT

Manufacturing Engineer / Process Planner July '86 – Aug '88
PRATT AND WHITNEY AIRCRAFT, North Haven, CT

Materials Engineer I June '83– July '86
AVCO LYCOMING, Stratford, CT

PUBLICATIONS

Vollaro, M.B. , Klein, R.R. , *"Completing the pass: Leadership 'on' and 'in' the field",* Proceedings of the 2016 ASEE Annual National Conference

Waters, C. , Krause, S., Weeks, P., **Vollaro, M.B.,** Dupen, B., and Callahan, J., "*Revealing Student Misconceptions and Instructor Blind Spots with Muddiest Point Formative Feedback*", Proceedings of 2016 ASEE Annual National Conference

Vollaro, M.B. , Klein, R.R. , *"Training for Leadership and Team Skills from Freshman Year Forward",* Proceedings of the 2015 ASEE Annual National Conference

Vollaro, Mary B., and Brennan, Michael, *"Leveraging student's interests in a senior design project through integration of materials selection methodology",* Proceedings of the 2014 ASEE National Conference

Dr. Owe G. Petersen (Milwaukee School of Engineering), Dr. R. David Kent (Milwaukee School of Engineering), Dr. Christina Howe (University of Evansville), and **Dr. Mary B. Vollaro (Western New England University), "***General Education: Key for Success for an Entrepreneurial Engineering Career"***,** Proceedings of the 2012 ASEE National Conference

Vollaro, M.B., "*Information Literacy as part of the Materials Science Course"*, Proceedings of the 2011 ASEE Annual Conference, Proceedings of the 2011 ASEE Annual National Conference

Vollaro, M.B., "*Student Perception of a Series of Activities in a Manufacturing Processes Course",* Proceedings of the 2009 ASEE Annual National Conference

Vollaro, M.B., "*Materials Selection Exercises based on Current Events",* Proceedings of the 2007 ASEE Annual National Conference

Vollaro, M.B., "*Engineering Exploration for Junior Girls Scouts: Partnership, Activities, Insight, and Reflection",* Proceedings of the 2006 ASEE Annual National Conference

Vollaro, M.B., "*More than Science Fair Fun*: *Poster Session as an Experiential Learning Activity in the Classroom",* Proceedings of the 2005 ASEE Annual National Conference

Mary B. Vollaro and Craig Johnson (Central Washington University), "*Materials Education 2004 Topical Trends and Outreach Effort*", Proceedings of the 2004 ASEE Annual Conference.

Vollaro, M.B.," *The Classroom is our Lattice": A Series of "Quick" Visualization Exercises for the Introductory Materials Science Course* ", Proceedings of the 18th Annual National Educators Workshop (NEW), Experiments in Engineering, Materials, Science and Technology, October 2004.

Musiak, R., Schreiner, S., **Vollaro, M.,** Lipkens, B., Haffner, E., Grabiec, R., "*The Total Learning Environment of our Freshman Engineering Students*", Proceedings of 2003 ASEE Annual Conference

Mindek, Jr., R.B., Keyser, T.K., Musiak, R.E., Schreiner, S., **Vollaro, M.B.,** "*Integration of Engineering Ethics Into The Curriculum: Student Performance and Feedback*", Proceedings of 2003 ASEE Annual Conference

Vollaro, M.B., "*Field Trips: An innovative approach in teaching 'Manufacturing Processes' to traditional undergraduates"*, Proceedings of 2002 ASEE Annual Conference

Schreiner,S., Keyser, T., Musiak,R., Mindek, R., **Vollaro,M.,** "*Strategic use of Manhattan: An Internet communication tool used with a freshmen engineering design course*", Proceedings of 2002 ASEE Annual Conference

Vollaro, M.B., "*Poster Sessions: A Learner-Centered Activity and Assessment Tool for Engineering Students",* Proceedings of the 2002 American Society for Engineering Education Zone 1 Conference

Park, Holly., Skutnik, Bolesh J., and **Vollaro, Mary B.,** "*Prototype for Numerical Aperture Tester for Step-Index Multimode Specialty Medical Optical Fiber*", Proceedings of the IEEE 28th Annual Northeast Bioengineering Conference

Musiak, R.E., Haffner, E.W., Schreiner, S., Karplus, A.K., **Vollaro, M.B**., Grabiec, R.A., "*Forging New Links: Integrating the Freshman Engineering Curriculum*", Proceedings of the 2001 ASEE Annual Conference

Vollaro, M.B. and Potter, D. I., "*Phase Formation in Coevaporated Ni-Cr Thin Films*", *Thin Solid Films*, 239 (1994) 37-46.

Vollaro, M.B. and Miller, J.A., "*Quality and Inspection of Brazed Joints*", American Society of Metals (ASM) Handbook, Vol. 6, Welding, Brazing and Soldering, 1993, American Society of Metals (ASM), 1117-1123.

Vollaro, M.B. and Miller, J.A., "*Inspection of Brazed Joints*", Brazing Handbook Fourth Edition, 1991, American Welding Society (AWS), 259-266.

PRESENTATIONS

Vollaro, M.B. , and Klein, R.R. , *"Training for Leadership and Team Skills from Freshman Year Forward"*, 2015 ASEE Annual Conference, Leadership (LEAD) Division, Seattle, WA, June 16, 2015

Vollaro, M.B., "*A model for senior design projects = Student's personal interests + Materials Selectin Methodology*", at the 6th North American Materials Education Symposium, March 25-27, 2015, at The Ohio State University, Columbus, OH

Vollaro, Mary B., and Brennan, Michael, *"Leveraging student's interests in a senior design project through integration of materials selection methodology",* 2014 ASEE National Conference, Indianapolis, IN, June 16, 2014

Vollaro, M.B., and Klein, R.R., "*Training in teaming and leadership from 'start to finish' in school and beyond….* ", Poster presentation, at KEEN 2013 Winter Meeting, January 3-4, 2013 in Tempe, AZ and at poster session of KEEN & ENT Division, June 25, 2013 at the ASEE 2013 Annual Conference in Atlanta, GA

Vollaro, M.B., "*Insights to Materials Selection from a Historical Perspective"*, conducted hands-on workshop, 2011 National Educators Workshop (NEW), October 16-18, 2011 in Greensboro, North Carolina

Vollaro, M.B., "*Information Literacy as part of the Materials Science Course"*, 2011 ASEE Annual Conference, 2011 ASEE Annual Conference in Vancouver, BC, Canada.

Vollaro, M.B., "*Improving the Technical Reporting Ability of Undergraduate Engineering Students: Common language description to handbook properties of materials",* 2nd North American Materials Symposium, March 2011 at Worcester Polytechnic Institute, Worcester, MA.

Vollaro, M.B., "*Student Perception of a Series of Activities in a Manufacturing Processes Course",* 2009 ASEE Annual Conference in Austin, TX, and 22nd Annual National Educators Workshop in Lynwood, WA, October 2007.

Vollaro, M.B., "*Materials Selection Exercises based on Current Events",* 2007 ASEE Annual Conference, Honolulu, HI, 21st Annual National Educators Workshop, 2006

Vollaro, M.B., "*Engineering Exploration for Junior Girls Scouts: Partnership, Activities, Insight, and Reflection",* 2006 ASEE Annual Conference, 2006 Annual Conference, Chicago, Illinois, and 20th Annual National Educators Workshop, Gaithersburg, MD, 2005

Vollaro, M.B., "*More than Science Fair Fun*: *Poster Session as an Experiential Learning Activity in the Classroom",* 2005 ASEE Annual Conference and 19th Annual National Educators Workshop, Phoenix, AZ, 2004.

Mary B. Vollaro and Craig Johnson (Central Washington University) *Materials Education 2004 Topical Trends and Outreach Effort*, 2004 ASEE Annual Conference, Salt Lake City, UT

Vollaro, M.B.," *The Classroom is our Lattice": A Series of "Quick" Visualization Exercises for the Introductory Materials Science Course* " 18th Annual National Educators Workshop, Experiments in Engineering, Materials, Science and Technology, Hampton, VA, October 2004

Musiak, R., **Schreiner, S.,** Vollaro, M., Lipkens, B., Haffner, E., Grabiec, R., "*The Total Learning Environment of our Freshman Engineering Students*", 2003 ASEE Annual Conference in Nashville, Tennessee, June 24, 2003.

Mindek, Jr., R.B., **Keyser, T.K.,** Musiak, R.E., Schreiner, S., Vollaro, M.B., "*Integration of Engineering Ethics Into The Curriculum: Student Performance and Feedback*", Proceedings of 2003 ASEE Annual Conference in Nashville, Tennessee, June 24, 2003.

Vollaro, M.B., "*Engineering Exploration for Junior Girls Scouts: Establishing a partnership and implementing a hands-on activity*", ASEE Zone 1 Conference, University of Maine, Orono, ME, May 1, 2003

Vollaro, M.B., "*Experiences using Manhattan: A personal perspective*", 2003 Wellen Davidson Seminar at Western New England College, Springfield, MA. , January 9, 2003

Vollaro, M.B., *"Field Trips: An innovative approach in teaching 'Manufacturing Processes' to traditional undergraduates",* 2002 ASEE Annual Conference, June 16-20, 2002 in Montreal, Canada.

Schreiner,S., Keyser, T., Musiak,R., Mindek, R., Vollaro,M., *"Strategic use of Manhattan: An Internet communication tool used with a freshmen engineering design course",* 2002 ASEE Annual Conference, June 16-20, 2002 in Montreal, Canada.

Bronson, C., and Vollaro, M.B*., "Assessment though our Roots: Transforming a Course Assignment in to a Course Embedded Assessment Tool",* 2002 American Association for Higher Education (AAHE) Assessment Conference, Boston, MA

Vollaro, M.B., "*Poster Sessions: A Learner-Centered Activity and Assessment Tool for Engineering Students",* 2002 American Society for Engineering Education Zone 1 Conference, April 5-6, 2002, United States Military Academy, West Point, NY

Presented workshop with ENGR103 team members, "*Workshop: Introduction of the Design Process to Freshman Engineering Students*" at the 2002 American Society for Engineering Education Zone 1 Conference, April 5 – 6, 2002 at the United States Military Academy, West Point, NY

Park, Holly., Skutnik, Bolesh J., and Vollaro, Mary B., *"Prototype for Numerical Aperture Tester for Step-Index Multimode Specialty Medical Optical Fiber*", IEEE 28th Annual Northeast Bioengineering Conference, April 20-22, 2002 at Drexel University, Philadelphia, PA

Vollaro, M.B., "*Poster Sessions: A Learner-Centered Activity and Assessment Tool for Engineering*", Development Series 2002-03 Enhancing Teaching and Learning at WNEC at Western New England College, Springfield, MA, December 4, 2002

Musiak, R.E., Haffner, E.W., **Schreiner, S**., Karplus, A.K., Vollaro, M.B., Grabiec, R.A., *"Forging New Links: Integrating the Freshman Engineering Curriculum*", 2001 ASEE Annual Conference, Albuquerque, NM, June 24-27, 2001.

Vollaro, M.B., Second Annual WNEC Engineering Symposium, "*Hands-on with a Scanning Electron Microscope*", Western New England College, May 20, 1999

Vollaro, M.B., First Annual WNEC Engineering Symposium, "*Review of Technology for Materials Characterization*", Western New England College, May 13, 1998

Vollaro, M.B., and Potter, D.I., "*Electrical Properties and Microstructure of Ni-Cr Thin Films*", Poster, Materials Research Society (MRS) 1996 Fall Meeting, December 2-6, 1996, Boston, MA

PROFESSIONAL DEVELOPMENT

Attended workshop, *Engineering Leadership Lab Demonstration*, at 2015 ASEE Annual Conference in Seattle, WA on June 14, 2015

Attended workshop, *Web-Enabled Tools and Resources for More Effective Teaching and Learning*, at ASEE Annual Conference in Indianapolis, IN, on June 15, 2014

Attended workshop, *Fast Formative Feedback to Enhance Learning and Motivation*, at 2013 ASEE Annual Conference in Atlanta, GA on June 23, 2013

Activities in support Kern Entrepreneurship Education Network (KEEN):

SEE Faculty Workshop, *"Shaping Entrepreneurial Engineers Faculty Workshop"* sponsored by KEEN network on best practices, January 5, 2013 in Tempe, AZ

Winter Meeting in Tempe, AZ on January 3-5, 2013

SCAN Meeting for KEEN group, Villanova University in November 16, 2012

KEEN Fall meeting in Milwaukee, WI on September 28-29, 2012

Pre-meeting workshop on KEEN Student Outcomes (KSO) rubrics for outcomes 1, 2 and 4, Milwaukee, WI on September 27, 2012

Meeting of SCAN Group at Union College in Schenectady, NY on June 1, 2012

KEEN Assessment Workshop and Meeting in Milwaukee, WI on April 18-20, 2012

SEE Workshop and Winter Meeting in Orlando, FL on January 3-6, 2012

KEEN Workshop and meeting in Milwaukee, WI on September 28-30, 2011

Attended (on scholarship), the Olin I2E2 faculty workshop, *Meeting the Needs of the 21st Century: Designing for Student Engagement*, at Franklin W. Olin College of Engineering in Needham, MA on June 13-17, 2011

Attended workshop, *Integrating Sustainability into Engineering: Design Principles and Tools to Expand Educative Capacity*, at ASEE 2010 National Conference in Louisville, KY in June 2010

Attended symposium, *Information Technology in Support of Materials Education*, at Stevens Institute of Technology, March 20, 2010

Participation with students, *2009 WERC International Environmental Design Contest on the task of "Wind-2-H2O: Converting Wind Energy to Mechanical Energy for Water Treatment*" at New Mexico State University in Las Cruces, MN

Attended workshop, *Web-based Assessment of Capstone Engineering Design*, ASEE 2009 National Conference in Austin, TX, June 2009

Attended workshop, *Case Studies in Engineering Education*, ASEE 2007 National Conference in Honolulu, HI, June 2007

Attended short course, *New Approaches in Materials Education; CES Edupack 2006* presented by Prof. Mike Ashby from Cambridge University, held in Chicago, IL, June 2006

Attended one-week course (NFS Grant funded), *Nanoscale Mechanical Characterization: The Theory and Practice of Contact Probe Techniques*, held Northwestern University, Evanston, IL, on Aug. 11-15, 2003

Attended short course, *New Approaches in Materials and Manufacturing Education; CES 4.0 Material Selector*, presented by Prof. Mike Ashby from Cambridge University, held in Nashville, TN, June 22, 2003

Attended 3-day teaching workshop, *Teaching Engineering Faculty to Teach in an Active Learning Environment*, Roger Williams University, August 13-15, 2001

Attended workshop, *Instruction on the use of Lego-Dacta kits and ROBOLAB software for age appropriate engineering experiences for grades K-12*, Tufts University, May 23, 2001

GRANTS AWARDED

September 2011, Kern Entrepreneurship Education Network (KEEN), Phase 1, Kern Family Foundation, $75,000

Summer 2011, Scholarship for the Olin I2E2 faculty workshop, *Meeting the Needs of the 21st Century: Designing for Student Engagement*, at Franklin W. Olin College of Engineering in Needham, MA (Awarded $2000 scholarship to participate in this week-long event attended by engineering faculty from around the world, e.g., mainland China, Peru, Singapore, England, Saudi Arabia, and more.)

Summer 2010, WNEC School of Engineering Summer Development Grant- Write proposal for WNEC's participation in the Grand Challenges Scholars Program sponsored by NAE (National Academy of Engineers), $1000

2009-10, Clean Energy Workforce Training Capacity Building Grant Program, Development in Life Cycle Analysis Course, $3500

Summer 2008, WNEC Curriculum Development Grant for ENGR105 course redesign, $500

2008-09, Center for the Advancement of Scholarship on Engineering Education, National Academy of Engineering to improve recruitment and retention of female students in mechanical engineering. $2400

Summer 2005, Curriculum grant for development of new ENGR105- freshman engineering course for applications and computer programming design using MATLAB, $1000

Summer 2003, National Science Foundation (NSF) Fellowship, Summer Institute on Nano Mechanics and Materials, at Northwestern University, Evanston, IL, on August 11-15, 2003

2001-2003, Awarded a position in 3-year grant funded by Engineering Information Foundation, "Leadership Skills and Community-Building Workshop for Women Junior Faculty in Engineering", Outward Bound Professional program at Hurricane Island, ME (August 2001), "Writing and Community Building Workshop" in Vergennes, VT (August 2002) and "Strategic Career Planning for Women in Engineering" in Northampton, MA (August 2003).

2001 SME Library Award, Society of Manufacturing Engineers (SME) Education Foundation, Materials to upgrade manufacturing library, $2252

March 2001, Western New England College Faculty Professional Development Grant, "Additional course development for ENGR103 Introduction to Engineering", $2000

Summer 1998, Western New England College Faculty Professional Development Grant, "The Development of a Training Manual and Maintenance Program for the Scanning Electron Microscope", $1000

SPECIAL ASSIGNMENTS (at Western New England University)

2012-2016, Program Coordinator College of Engineering Honors Program, and **Chair** of College of Engineering Honors Program Committee**.** Developed hybrid model with cohort and honors-by-contract courses to meet the needs of the College of Engineering Honors students

2011-2013, KEEN PI and WNE Coordinator, **PI and Coordinator** for KEEN grant

2011-2013, Program Designer and Coordinator, WNE College of Engineering Grand Challenges Scholars Program sponsored by NAE (National Academy of Engineers)

2012-2013, Coordinator, WNE College of Engineering Study Abroad initiatives with HEI in Universite Catholique De Lille in Lille, France

COURSES TAUGHT (at Western New England University)

ME309 *Materials Science*, 3 credits, Undergraduate

EE312 *Electrical Materials and Devices*, 3 credits, Undergraduate

BME340 *Introduction to Biomaterials*, 3 credits, Undergraduate

ME208 *Mechanics of Materials,* 3 credits, Undergraduate

ME322 (previously **IE314**) *Manufacturing Processes*, 3 credits, Undergraduate

ENGR103 *Introduction to Engineering*; 4 credits, Freshmen

ENGR102 *First Year Engineering Seminar*, 1 credit, Required, Freshmen

HONE 102 *Honors First Year Engineering Seminar*, 1 credit, Freshmen

ENGR 100 *Engineering Seminar & College Success Skills*, 2 credits, Freshmen

ENGR 105 (ENGR110) *Computer Applications in Engineering*, 2(3) credits), Freshmen

ME313 *ME Laboratory I*, Undergraduate (Jr.) –Strain gauges & cantilever beam

ME314 *ME Laboratory II*, Undergraduate (Jr.) - Cold work & recrystallization of cartridge brass

IE318 *IE Design Lab I*, Undergraduate (Jr.) , **IE428** *IE Design Lab III*, Undergraduate (Sr.)

ME 412 *Green Engineering: Materials Selection in the Life Cycle Design Process*, 3 credits, Upper level undergraduate

ME 480 *Internship for Mechanical Engineering*, 3 credits

EMGT 590 and EMGT690 – *Special Topics in Engineering Management: Topics in Advanced Manufacturing Processes***,** Upper level undergraduate/ Graduate

ME640 *Materials Selection and Manufacturing Process,* 3 credits, Graduate

COURSE HIGHLIGHTS (from Western New England University)

Use of virtual classroom Kodiak (Desire2Learn software) – All courses presented on this platform and contain course materials. Report from WNE Information Technology indicated ENGR 102 First Year Seminar course utilized the most Kodiak features (7) of any course on campus.

The Annual Materials Science Poster Session – Students chose a topic, research the literature for information on 'properties, processing, and microstructure', create a poster, and present it in a symposium format.

Information Literacy for Materials Science – Workshop conducted in collaboration with our librarian in support of the ME309 project, i.e., poster and paper.

'Muddiest Points' student centered inquiry to facilitate student learning in Materials Science.

Interactive classroom in Manufacturing Processes, including hands-on activities, videos with guided reflection, 'video' exams, and student presentations.

Assignments utilizing the CES Edupack Materials Selection software (Granta Design) in Materials Science and Manufacturing Processes.

Exemplar assignments in ENGR 102 First Year Seminiar for assessment of university-wide competencies in information literacy and professional development for the WNE First Year Program.

Course management in ENGR 102 First Year Engineering Seminiar with 160-180 freshman students and 18 FSA's (Freshman Seminiar Assistant), who conduct lessons and activities in 'breakout rooms' for their group of 20-25 students prior to meeting as a large group.

Leadership and teamwork skills in ENGR 102 First Year Engineering Seminiar utilizing assessment instruments, MBTI (Myers-Briggs Type Indicator) and new KGI (Klein Group Instrument), and students are 'trained' in workshops and with guided reflection.

Industry tours in Manufacturing Processes- The required industrial tours coincided with the manufacturing processes being studied in class and a guided reflection activity was required. *Tours included*: • Yankee Casting Co., Inc. / Yankee Magcast Co. in Enfield, CT
• Techni-Products, Inc. in East Longmeadow, MA • Smith & Wesson, Inc. in Springfield, MA
• O-A, Inc. in Agawam, MA, • American Saw & Manufacturing, Co. in East Longmeadow, MA
• A.G. Miller, Inc. in Springfield, MA • Hamilton Sundstrand in Windsor Locks, CT
• Columbia Manufacturing, Inc., in Westfield, MA

ADVISING (at Western New England University)

Academic advisor to 20-30 students per year; 1997-2011 for freshman engineering students, and 2012 – present for Mechanical Engineering students in sophomore, junior, and senior years.

FACULTY SUPPORT ACTIVITIES (at Western New England University)

Coordinate the **Alumni Mentoring Program** (AMP) with College of Engineering and Alumni Office.

Sponsored many **Learning Beyond the Classroom (LBC) experiences** and **reviewed** papers for more than 20 students per year.

Support recruitment and retention efforts by conducting **tours and interviews** for prospective students, making **recruiting calls** (50+ calls per year to prospective ME and ENGR students)

Wrote numerous **Letters of Recommendation** for student's at all academic levels, ongoing

Participate in **department efforts** to hire new faculty, ABET, student recognition events, and program improvements, ongoing

Participate **Convocation** (Marshall), Academic Awards events (presenter), **Commencement** (platform party and assisting with diplomas)

Faculty representative, Western New England University Open House for prospective students, 1997 - present

Instructor and Faculty Advisor, SOAR (Summer Orientation and Registration) program: First Class in Engineering, Faculty Expectations Panel, Advising and Registration, 1997 - present

PROFESSIONAL SERVICE

Leadership positions, Materials Division, American Society For Engineering Education (ASEE) Materials Division, Immediate-Past Division Chair (2008-09), National **Division Chair** (2006-07), **Program Chair** (2004-05)

Peer Reviewer, Materials Division, ASEE Annual Conference, 2003- present

Session Chair, Materials Division, ASEE Annual Conference numerous times, 2003-present

Peer Reviewer, Leadership (LEAD) Division**,** ASEE Annual Conference, 2015-16

Member, Organizing Committee, National Educators Workshop for Materials Education (NEW), 2005- 09, **Session chair, peer reviewer** NEW at numerous times, 2002-2009

Member, Review Panel, National Science Foundation, for proposals submitted to the Division of Undergraduate Education (CSEMS), Washington, D.C., November 1999.

UNIVERSITY-WIDE GOVERANCE (at Western New England University)

Member, University Senate Athletics and Recreation Committee, 2015- present

Member, Academic Standards Committee of the Faculty Council, 2011-present

Chair of Western New England University Faculty Senate, 2012-13

Chair of Nominations and Rules Committee, University Faculty Senate, 2012-13

Member of General University Requirements (GUR) Committee 2012-15; **Chair** 2013-15

Senator, Western New England University Faculty Senate**,** 2012-14

Member of University-wide Ad Hoc Committee on General Education Requirements, 2011-14

Member of General College Requirements Committee 2007-11; **Chair** 2008-09

Chair of Western New England College Faculty Senate, 2006-07

Vice-Chair of Western New England College Faculty Senate, 2005-06

Senator, Western New England College Faculty Senate, 2 terms (2005-07 and 2007-2009)

Member of college wide committee for 2011 NEASC Accreditation Committee, **Chair** of NEASC Standard #11, Integrity

Member of Academic Standards Committee 2007-11; **Chair** 2007-08, 2008-09

Member of college-wide Strategic Planning Committee 2008 thru Fall 2009, **Chair** of Sub-committee for Sustainability

Member of college-wide 2001 NEASC Accreditation Committee; **Member** of NEASC Integrity Committee

Member of Lecture Day Committee, 1998-1999

Member of Academic Standards Committee, 1997-98

Member of Search Committee for Provost/Vice President of Academic Affairs (Selected by President Caprio) 1997

COLLEGE OF ENGINEERING GOVERANCE (at Western New England)

Chair of Honors Committee, 2011- present

Member of Hall of Fame Committee, 2014-present

Chair of Peer Review Committee (PRC) for Promotion and Tenure, 2014-15

Member of Peer Review Committee (PRC) for Promotion and Tenure, 2013-14

Member of New Initiatives Committee, 2008-09

Member of Strategic Planning Committee, 1997-98

Member of Admissions/Retention Committee, 1997-98

Member of Curriculum Committee, 1997

Member of Retention and Outreach Committee, 1997

OUTREACH FOR STUDENTS AND THE COMMUNITY

2003 –2011, **Coordinator and presenter,** "Engineering Exploration for Junior Girl Scouts", Activity co-sponsored by WNEC and Girl Scouts of Pioneer Valley and attended each year by 20-50 Girl Scouts, hosted on the campus of Western New England.

Faculty representative, **Leadership School Science Fair Activity, Western New England College, May 29, 2003**

Instructor, "Exploring Engineering", Workshop for after school enrichment program, March Madness", at Somers Elementary School, Somers, CT, March 2001 and 2002

Instructor, "Introduce a Girl to Engineering Day", Outreach program and activities at Western New England College, Springfield, MA on February 22 and April 26, 2001

Faculty advisor, WNEC student chapter of the Society of Women Engineers (SWE),1997-2007
Highlights: Team Building and Networking through the Ropes Course Activities at Springfield College, Springfield, MA, October 19, 2002; SWE Alumni Dinner and Panel Discussion 2000-2003, Western New England College, Springfield, MA

Co-organizer, Faculty co-chair of the 3rd and 4th Annual Applied Engineering Symposium at Western New England College, May 2000 and 2001.

Session moderator, The Annual Engineering Symposium on May 22, 2002 at Western New England College, Springfield, MA.

FACULTY ADVISOR FOR SENIOR DESIGN PROJECTS / INTERNSHIPS

***Work done in the WNE College of Engineering laboratories unless otherwise noted.*

Spring 2016, "   "Robert Jenkins, *Industrial Sponsor:* American Eagle Cycles, Inc. Westfield, MA

Fall 2015, "Design and Analysis of a Hockey Stick: A Material Selection Project", Anthony Vincequere

Spring 2015 "Materials Science and Manufacturing: Process Design for Welding", Danyelle Bigda, *Poster Competition Winner**

Spring 2015 "Surface Characterization of Indium Tin Oxide Bioelectrodes", Stephen Faivre

Spring 2015 "Design and Analysis of the Quick-Release Mechanism for Facemasks of a Football Helmet; A Material Selection Project", Andrew Gatzogiannis

Spring 2015 "Material Science and Manufacturing: Design Process for Welding", Ryan Gazlay

Spring 2015 "Design Optimization of Heat Treatment", Joshua Rose, *Industrial Sponsor*: Yankee Casting Inc., Enfield, CT

Spring 2015 Design of an Exhibit to Demonstrate Engineering Principles in Rowing, Ryan Scott

Spring 2015 Fatigue Life Prediction of a Welded and Pressurized Aerospace Structure, Tom Sullivan, *Industrial Sponsor*: Design Automation Associates, Inc., Enfield, CT

Spring 2014, "Feasibility and Material Selection for an Electronic Turf Field", Ryan Flanigan

Spring 2014, "The Design and Feasibility Study of An Artificial Turf Field", Terry Crocker

Spring 2014, "Material Study and Performance Comparison of Baseball Bats", Ryan Skelly

Spring 2014, "Analysis of Materials in the Design Optimization of Fishing Rods", Kevin Wilkes

Spring 2013, "Unweldable or just difficult? A Comparison of TIG Welding Parameters on Precipitation Hardened Stainless Steel", Shane Haluch

Spring 2013, " Is it really a mystery? Analysis of Servo Pneumatic Valve Spool Corrosion". Kyle Pepin, *Industrial sponsor*: Enfield Technologies, Shelton, CT

Spring 2013 "Determination of Bend Point and Associated Attributes for Lenox Tools", Nicholas Wiltey, *Industrial sponsor*: Lenox Tools, East Longmeadow, MA

Spring 2013 “Analysis of Core Materials for the Design and Fabrication of an All Mountain Ski”, Michael Brennan

Spring 2013 “A Comparison of TIG Welding Joint Design with Aluminum”**,** Dillon Young *Poster award winner*

Spring 2012 *“*Why do I keep fixing the same old thing? A comparison of Two Welding Processes”, Andrew Scanlon

Spring 2012, “Materials and Product Design of a High Speed Shutter”, Matthew Allen, Work *Industrial sponsor:* Precision X-Ray, North Branford, CT

Spring 2012, “Effect of Coolant on Chips Produced by Milling”, Paul Dougan

Spring 2012, “A comparison of Welding Parameters for Two different Materials using the MIG Process”, Matthew J. Costopoulos

Spring 2011, “Created Equal? A comparison of three welding processes”, Travis Hatch

Spring 2011, “A Comparison of Welding Parameters for Three Different Materials Using MIG Process”, Ben Althen *Poster winner*

Spring 2011, “Re-design of the WNEC Freshman Design Project”, Adam Petrillo

Spring 2011, “Material Selection and Product Development”, Andrew Labrie

Spring 2009, “Wind-2-H2O: Design and Fabrication of a Water Treatment Device’, Brian Carrigan and Michael Massa WERC International Environmental Design Contest at University of New Mexico, Las Cruces, NM

Spring 2009, “Design and Implementation of an Improved Process for Tip Welding”, *Industrial Sponsor:* Newell Rubbermaid, Inc., Lenox, East Longmeadow, MA

Spring 2009, “Design and Implementation of an Improved Process for Flash Butt Welding”, *Industrial Sponsor:* Newell Rubbermaid, Inc., Lenox, East Longmeadow, MA

Spring 2007, “Design of an Exhibit on Welding Processes”, Christopher Orlando

Spring 2007, “Optimization of a Tungsten Source for NiCr Evaporation of a Microchannel Plate”, Francis Langevin, *Industrial Sponsor*: Burle Electro-Optics, Inc., Sturbridge, MA

Spring 2006, "Study of the Properties and Microstructure of Welding Super-Alloy Materials", Jason Laforge, *Industrial Sponsor:* Barnes Aerospace, Windsor Airmotive Division, East Granby, CT

Spring 2006, "Design and Construction of a Thermoforming Machine to Test the Effect of Color on Plastics', Lindsey Burns, *Industrial Sponsor:* Universal Plastics, Holyoke, MA

Spring 2005, "Design of a High Profile Heat Style for a Plastic Squeeze Tube", Vincent Cross, *Industrial Sponsor:* Tubed Products, LLC, Easthampton, MA

Fall 2004, "Design, Development and Implementation of an Exhibit on Material Hardness", Christopher Sparrer

2001-02 "Process Control and Modification of Leaded Glass Reduction Done Through a Hydrogen Furnace", Megan Melch, *Industrial sponsor:* K and M Electronics, Inc., West Springfield, MA

2001-02 "Prototype for Numerical Aperture Tester for Step-Index Multimode Specialty Medical Optical Fibers", Holly K. Park, *Industrial sponsor:* CeramOptec Industries, East Longmeadow, MA

2000-01 "Analysis and Characterization of an Ultraviolet Curing System", Erica Landry, *Industrial sponsor*: Rexam Image Products, South Hadley, MA

2000-01 "Design and Implementation of a Highly Efficient Changeover System in the Ball Finishing Area", Roland A. Lessard and Matthew D. Gidman, *Industrial sponsor:* Saint Gobain Advanced Ceramics East Granby, East Granby, CT

Spring 2001 "Materials Characterization Project" in fulfillment of the requirements of EMGT680 Engineering Management Independent Study, Roger Bemont, *Industrial sponsor:* Hamilton Sunstrand, Windsor Locks, CT

Fall 2000 "UV, VIS, and NIR Spectral Losses of High- and Low OH Optical Fibers for Medical Applications", Holly Park, *Industrial internship*: CeramOptec, Inc., East Longmeadow, MA

1999-2000 "Design / Analysis of a Probability of Detection (POD) Curve Using Panel Validation", Tyson Hatch, *Industrial sponsor:* Hamilton Sunstrand, Windsor Locks, CT

1998-99 "The Design and Fabrication of a Device that will Investigate the Effects of Bruxism on Teeth", Co-advisor, Lino S. Italia

Spring 1998 "Improvements in Heat Treatment of B32 High Strength Steel", Matthew Keane, *Industrial sponsor:* American Saw and Manufacturing, Inc., East Longmeadow, MA

Curriculum Vitae—Jim Dewey—January 2015

Contact Information
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Florida Polytechnic University, IST 2092
4700 Research Way
Lakeland, FL 33805-8531

Employment

August 2014—Present. Assistant Professor of Economics and Director of Economic Analysis, Florida Polytechnic University.

August 2005—August 2014. Director, Economic Analysis Program, Bureau of Economic and Business Research, University of Florida.

August 1998—July 2005. Research Economist, Economic Analysis Program, Bureau of Economic and Business Research, University of Florida.

August 1992—July 1994. Instructor, Economics, University of South Florida.

Education

Ph.D., Economics, University of Florida, December 1998.
Fields: Microeconomic Theory, Industrial Organization, Public Economics
Awards and Honors: Rafael Lusky Prize; Robert F. Lanzillotti Prize; Walter-Lanzillotti Dissertation Fellowship; College of Liberal Arts and Sciences Dissertation Fellowship; Madelyn M. Lockhart Award

M.A., Economics, University of South Florida, August 1992.

B.A., Economics and Political Science, University of South Florida, May 1992.
Awards and Honors: Summa Cum Laude, Kosove Scholar

Research Interests

Applied analysis at the intersection of urban and regional economics, education economics, and public policy, e.g.: 1) local economic development; 2) determinants of local government spending; 3) teacher supply and demand; 4) education finance and reform; 5) population projections and public planning; 6) the fiscal impact of development.

Teaching

2014-2015: Florida Polytechnic University: Principles of Microeconomics; Principles of Macroeconomics; Statistics 1; Research Methods (graduate).

1997-2013: University of Florida: 2009-10 Warrington College of Business Administration Teacher of the Year; Electronic Platform Managerial Economics (600-800 students, extensive course development, advising, and mentoring); Traditional Managerial Economics; University Scholars Program Faculty Mentor; Quantitative Foundations of Educational Research.

1992-1994: University of South Florida: Principles of Microeconomics; Intermediate Price Theory; Intermediate Macroeconomics.

Refereed Journal Articles

8) Variability in Demand for Special Education Teachers. *Exceptionality*. April 2013. (With Ed Boe, Lorrie deBettencourt, Chris Leko, Mike Rosenberg, and Paul Sindelar)
7) Cost Effectiveness of Alternative Route Special Education Teacher Preparation. *Exceptional Children*. Fall 2012. (With Nancy Corbett, Bob Lotfinia, Mike Rosenberg, & Paul Sindelar)
6) Baby Boom Retirees and Florida's Job Structure. *Business and Economics Journal*. May 2012. (With Dave Denslow)
5) Low, Declining, Polarizing: Florida's Job Structure. *Business and Economics Journal*. May 2012. (With Dave Denslow)

4) Inter-City Wage Differentials and Intra-City Workplace Centralization. *Regional Science and Urban Economics*. September 2009. (With Gabriel Montes-Rojas)
3) Economic Analysis and the Design of Alternative Route Teacher Education Programs. *Journal of Teacher Education*. November/December 2007. (With Chifeng Dai, Dave Denslow, Mike Rosenberg, and Paul Sindelar)
2) More is Less? Regulation in a Rent Seeking World. *Journal of Regulatory Economics*. September 2000.
1) The Ineffectiveness of School Inputs: A Product of Misspecification? *Economics of Education Review*. February 2000. (With Lawrence Kenny and Thomas Husted)

Other Publications

16) The Florida Retirement System: a Poster Child for State Government Budgeting. *BEBR Web Brief*. March 2014. (With Dave Denslow, Ray Schaub, and Yujing Zhang)
15) Will Florida become the new Mississippi? *BEBR Web Brief*. March 2014. (With Dave Denslow)
14) Retirees and Florida's Job Structure. BEBR Web Brief. February 2014. (With Dave Denslow)
13) Tougher Choices Shaping Florida's Future. LeRoy Collins Institute. February 2014. (With Dave Denslow and others)
12) Florida Sales Tax Policy and Internet Sales. *BEBR Web Brief*. January 2014. (With Ray Schaub and Colleen Porter)
11) Labor Market Polarization in Florida. *BEBR Web Brief*. May 2013. (With Dave Denslow)
10) Florida's Long Term Economic Trajectory Emerging from the Great Recession. *BEBR Web Brief*. September 2012.
9) Trends in Florida's Job Structure 2001 to 2008. *BEBR Web Brief*. July 2012. (With Dave Denslow)
8) Florida's Job Structure. *BEBR Web Brief*. May 2012. (With Dave Denslow)
7) The Structure of Florida's Economy and Educational Attainment. *BEBR Web Brief*. April 2012. (With Dave Denslow)
6) Economic Implications of Florida's Proposed Property Tax Amendment. *Florida Focus*. (BEBR) January 2008. (With Dave Denslow, Lynne Holt, and Babak Lotfinia)
5) Soaring House Prices and Wages of Local Government Employees. *Florida Focus*. (BEBR) June 2007. (With Dave Denslow and Tom Durrenberger)
4) Funding Florida's Education Standards, 2009-10 and 2014-15. Chapter 6 in *Tough Choices Shaping Florida's Future*. LeRoy Collins Institute Tallahassee, FL. October 2005.
3) Living the Good Life in Gainesville. *The Gainesville Sun - Almanac*. March 25, 2001.
2) Review of Werner Troeskens's Why Regulate Utilities? The New Institutional Economics and the Chicago Gas Industry. *Public Choice*. 1999.
1) The Political Economy of Privatization. In *Restructuring State and Local Services*. Arnold H. Raphelson, Editor. 1998. (With Philip K. Porter)

Working Papers and Works in Progress

10) Passing the Buck for Public Spending or Feeding Leviathan? The Interacting Roles of Assessment Limits and Voter Education. Working Paper. (With Larry Kenny).
9) Benefit-Cost Analysis of a Beverage Container Deposit Refund System. Working Paper. (With Belen Chavez, Dave Denslow, Lynne Holt, and Henrique Romero)
8) Components of the Decline in Special Education Teacher Employment. Working Paper. (With Paul Sindelar, Chris Leko, Liz Bettini, Ed Boe, and Mike Rosenberg)
7) School Reform, SLD Prevalence, and Academic and Behavioral Outcomes for Students with Disabilities and Students at Risk. Working Paper. (With Paul Sindelar and Chris Leko)

6) Using Simple Wage Indices in School Funding Adjustments: A Test Using Teacher Turnover in Florida and Texas. (With Shiva Koohi and Belen Chavez)
5) Teacher Attrition and Alternative Teacher Certification Programs. (With Natalia Pakhotina)
4) Funding Disequalization – When Price Indices are Not Appropriate for Spatial Cost Adjustments. (With Dave Denslow)
3) Why Less Can Be More with Spatial Price Indices. (With Henrique Romero)
2) Impact Fees and Optimal Growth. (With Burcin Unel)
1) Improved Starting Salary Based Rankings of Undergraduate Business Programs: Adjusting for Regional Variation in Amenities and Price Levels. (With Mike Canencia)

Technical Reports

26) Florida Price Level Index. Annual 2000-Present. (With others)
25) University of Florida Clinical and Translational Science Institute Pilot Awards and External Funding. January 2015. (With Ray Schaub)
24) Plum Creek, UF, and Economic Growth in Gainesville. November 2013. (With Dave Denslow and Ray Schaub)
23) A Benefit-Cost Analysis of Cooling Therapy for Newborns with HIE. October 2013. (With Ray Schaub)
22) A Benefit-Cost Analysis of Guided Antiplatelet Therapy at UFHealth. July 2013. (With Ray Schaub)
21) The Economic Impact of the University of Florida's Clinical and Translational Science Institute. June 2013. (With Ray Schaub)
20) The Tipping Point: Trends Shaping Florida's Job Structure. November 2011. 42 pages. (With Dave Denslow)
19) Indicators of Florida's Economic Competitiveness. May 2011. 66 pages with appendices. (With Dave Denslow, Eve Irwin, and Susan Floyd)
18) Analysis of a Florida Beverage Container Deposit Refund System. March 2011. 20 pages. (With Dave Denslow, Lynne Holt, Belen Chavez, and Henrique Romero)
17) High Value Added Green Economic Development for Sarasota County. February 2010. 161 pages. (With Dave Denslow, Lynne Holt, Ted Kury, Belen Chavez, Henrique Romero, and Katie Thomason)
16) Analytical Services Related to Property Taxation: Part 2 Revenue Component. August 2007. 264 Pages. (With Dave Denslow, Gabriel Rojas, Babak Lotfinia, and, Lynne Holt)
15) The Quality of Florida's Job Structure. Enterprise Florida. April 2006. 17 Pages. (With Dave Denslow and Bob Lotfinia)
14) Measuring the Quality of Florida's Job Structure. Enterprise Florida. May 2006. 134 pages. With Dave Denslow and Bob Lotfinia)
13) Improvements to the 2003 Florida Price Level Index: Background, Theory, Tests Based on the Current Population Survey, the Relationship Between Excess Teacher Turnover in Florida's Schools and the Market Basket Approach, and Robustness Checks. May 2005.
12) Research on the Florida Education Finance Program: the Florida Price Level Index, the Sparsity Supplement, and Discretionary Millage. March 2004. 134 Pages. (With Dave Denslow and Babak Lotfinia)
11) Review of Tischler & Associates, Inc.'s 'School Impact Fees. Manatee County, Florida.' February 2004. (Prepared for the Home Builders Association of Manatee County and the Gulf Coast Builders Exchange.)
10) Independent Assessment: Florida's Non-Emergency Medicaid Transportation Services. November 2003. 68 Pages. (With Chifeng Dai, and Babak Lotfinia)

9) Growth and Infrastructure in Manatee County, Florida: Does Conventional Development Pay its Share of Public Costs? October 2003. 40 Pages. (For the Home Builders Association of Manatee County and the Gulf Coast Builders Exchange)
8) Report on Trends and Conditions Research: The Magnitude of Population Adjustment to Transportation Investments and its Implications for Transportation Planning in Florida. February 2003. 51 Pages. (With Dave Denslow and others)
7) Response of Railroad and Truck Freight Shipments to Optimal Excess Capacity Subsidies and Externality Taxes. An Empirical Study of Florida's Surface Freight Transportation Market. September 2002. 45 Pages. (With Dave Denslow and David Lenze)
6) Report on Trends and Conditions Research: the Impact of the Internet on Transportation in Florida – Current Economic Perspective and Possibilities for Further Research. March 2002. 18 Pages. (With Dave Denslow and Kevin Christensen.)
5) Growth and Infrastructure in Alachua County: Does Conventional Development Pay its Share of Public Costs? August 2001. 37 Pages. (With Dave Denslow. For the Gainesville Builders Association)
4) Report on Trends and Conditions Research: Modeling Demographic and Economic Trends and Their Relation to the Supply and Demand for Transportation. August 2000. 50 Pages. (With Dave Denslow)
3) Report on the Florida Price Level Index: Alternative Methods for Measuring Costs Across Counties. February 2000. 41 Pages. (With Dave Denslow)
2) Report on the Florida Price Level Index: Impact of Dropping Items. June 1999. 17 Pages. (With Dave Denslow)
1) Report on the Florida Price Level Index. January 1999. 80 Pages. (With Dave Denslow and John Scoggins)

Presentations

23) Tougher Choices: Shaping Florida's Future. 3rd Annual Florida College Access and Success Summit. October 2014. Tampa, Florida.
22) Tougher Choices: Shaping Florida's Future. Florida Local Government Investment Trust Seminar. August 2014. Orlando, Florida.
21) Tougher Choices: Shaping Florida's Future. February 2014. LeRoy Collins Institute Board Meeting. February 2014. Tallahassee, Florida.
20) Declines in Identification of Students with Disabilities and Employment of Special Education Teachers. Annual Conference, Teacher Education Division, Council for Exceptional Children. November 2013. Fort Lauderdale, Florida.
19) Tough Choices, Revisited. LeRoy Collins Institute 25th Anniversary Symposium. October 2013. Tallahassee, Florida.
18) Florida at the tipping point. Florida League of Cities' Inaugural Research Symposium, *Funding our Future*. August 2012. Hollywood, Florida.
17) Baby boom retirees and Florida's job structure. Florida Regional Economic Symposium, April 2012. Lakeland, Florida.
16) Low, declining, polarizing: Florida's job structure. Florida Regional Economic Symposium, April 2012. Lakeland, Florida.
15) Declining Demand for Special Education Teachers: Its Origins and Implications. Symposium sponsored by UFs School of Special Education, School Psychology, and Early Childhood Studies. February 2012. Gainesville, Florida.
14) Are Alternative Route Programs Cost Effective? Georgia State University, Research Wednesday Speaker Series. December 2009. Atlanta, Georgia.
13) Local Government Reactions to Surges in Property Values. Presented at the 78th Annual Meeting of the Southern Economics Association, November 2008. Washington, D.C.

12) Inter-city compensating wage differentials and intra-city workplace centralization. 47th Annual Southern Regional Science Association Meeting, March 2008. Washington, D.C.
11) Evaluating Alternative Routes to Certification. National Center for Alternative Certification Conference, February 2005. Orlando, Florida.
10) Summary of Research and Recommendation on the FPLI in the DCD. Presentation to the Florida House of Representatives, meeting as a Committee of the Whole. April 22, 2004.
9) Research on the FEFP: the FPLI, Sparsity, and Discretionary Millage. Presentation to the Florida Senate and House Education Appropriations Subcommittees. February 10, 2004.
8) Optimal Investments in Special Education Teacher Preparation. Annual Meeting of the Teacher Education Division of the Council for Exceptional Children. November 2004. Biloxi, Mississippi.
6) Growth and the Cost of Living in Marion County, Florida. Presentation to the Marion County Public Policy Institute, April 2003. Ocala, Florida.
5) The DCD and Other Components of the FEFP Presented to the Florida Task Force for School Finance Reform, August 2001. Tallahassee, Florida.
4) Florida Education Funding Outlook. Annual Meeting of the Florida School Finance Officer Association, November 2000. Ocala, Florida.
3) Determining the Rules of the Game. Annual Meeting of the Public Choice Society, March 1998. New Orleans, Louisiana.
2) The Politics of Regulation: More is Less? Southeastern Economic Theory and International Economics Conference, November 1997. Chapel Hill, North Carolina.
1) The Economic Theory of Regulation: Normative and Positive Aspects. Annual Meeting of the Public Choice Society, March 1997. San Francisco, California.

Funded Research

14) Florida Price Level Index. Florida Dept. of Ed. and the State of Florida. 1998-Present. Over $1.7 million cumulative. Including service as an expert witness for the Florida Senate in The School Board of Miami Dade County et al. v. James E. King Jr. et al. in 2005.
13) Analysis of the University of Florida's Clinical Translational Science Institute's Pilot Award Program. University of Florida's Clinical Translational Science Institute. 2014. $29,000.
12) Tough Choices Follow On Study. LeRoy Collins Institute. 2013. $40,000.
11) Economic Impact of the University of Florida's Clinical Translational Science Institute. University of Florida's Clinical Translational Science Institute. 2012-13. $40,000.
10) Development, UF, and Alachua County's Future. Plum Creek, Inc. 2012-13. $40,000.
9) Indicators of Florida's Economic Competitiveness. UF President's Office. 2011. $30,000.
8) Analysis of a Beverage Container Deposit Refund System. Owens IL, Inc. 2010-11. $31,750
7) High Value Added Green Economic Development for Sarasota County. Sarasota County and the U.S. Department of Energy. 2009-10. $66,312
6) An Analysis of Reforms to Florida's Property Tax System. Florida Legislature, Office of Economic and Demographic Research. 2006-07. $142,597
5) Measuring and Evaluating Florida's Job Structure. Enterprise Florida. 2005-06. $50,000.
4) An Independent Assessment of Florida's Medicaid Transportation Waiver. Florida Agency for Health Care Administration. 2003. $100,000.
3) Benefit-Cost Analysis of Alternative Routes to Certification in Special Education. UF Center for Personnel Studies in Special Education. 2003-05. $180,000.
2) Rail/Truck Freight Allocation Policy Research. Florida Dept. of Trans. 2001-02. $80,000.
1) Trends and Conditions Research. Florida Dept. of Trans. 1999-2003. $145,000 cumulative.

Consulting

7) Analysis of the impact of munitions discovered at the Pinecastle Jeep Range on property values for *Robert Bernardo, et al v. Morrison Homes, Inc., et al*. 2010-11.
6) Analysis of construction related price increases for Progress Energy Florida, for *S&B Engineers and Constructors Ltd. v. Progress Energy Florida*. 2007.
5) Review of "Economic Analysis of Proposed Critical Habitat Designation for the Florida Beach Mice and Alabama Beach Mice." For Industrial Economics Incorporated and the U.S. Fish and Wildlife Service. 2006.
4) Wage analysis for the Florida Attorney General's office for *Florida Association of Rehabilitation Facilities, Inc. et al. v. Agency for Health Care Administration*. 2005
3) Analysis of the fiscal impact of new development in Manatee County, Florida, for the Home Builders' Association of Manatee County and the Gulf Coast Builders Exchange. 2003.
2) Review of Addy, Ijaz, and Zumpano's Shelby County Impact Fee Study. Conducted for the Greater Birmingham Association of Homebuilders. 2003.
1) Analysis of the fiscal impact of new development in Alachua County, Florida, for the Gainesville Builder's Association. 2001.

Florida Polytechnic Service

3) Florida Polytechnic Committee Ad Hoc Committees: Faculty-Administration Relations Study Committee (Chair), 2014-2015.
2) Florida Polytechnic Committee Standing Committees: 2014-2015; Campus Master Plan Committee (2014-); Academic Policy Committee (2014-); Faculty Curriculum Committee, Innovation and Technology (2014-).
1) Florida Polytechnic, Other: Academic Advising; Preparation of materials on Florida Polytechnic's role in catalyzing STEM based economic development in Florida for administrative use.

Professional Service

5) Numerous presentations to and meetings with state and local officials on economic and policy issues, e.g. local option taxes, property taxes, economic development, sustainability.
4) Regularly responding to inquiries from the media, state and local governments, and businesses for information and interpretation of data or events.
3) ACCRA COLI Advisory Board, Council for Community and Economic Research.
2) Committees related to Florida's Social Science Teacher Certification Exam (Grades 6-12), including competency and skill revision, item specification validation, and test validation.
1) Referee for *The Journal of Law, Economics, and Organization, Journal of Regulatory Economics, Journal of Economics and Management Strategy, Southern Economic Journal,* and *Bulletin of Economic Research*.

Professional Associations

Southern Regional Science Association; American Economic Association; American Real Estate and Urban Economics Association; Southern Economic Association; Council for Exceptional Children, Teacher Education Division.

Reinaldo Sanchez-Arias

reinaldosanar@gmail.com • www.reisanar.com

Research Interests include: numerical optimization, operations research, computational linear algebra, data mining, machine learning, data science education

Research and Teaching Experience

Assistant Professor of Data Science and Assistant Department Chair — **Florida Polytechnic University**
Department of Data Science and Business Analytics — *August 2018 – Present*

Courses taught: (* *indicates graduate courses*)

CAP 4770 | Data Mining and Text Mining	QMB 5565| Quantitative Research Methods *
COP 2073 | Introduction to Data Science	CAP 5320 | Data Wrangling and Exploratory Data Analysis *
STA 3241 | Statistical Learning	CAP 5771 | Data Mining and Text Mining*
CDA 4910 | Directed Research	CAP 5735 | Data Visualization and Reproducible Research *
CIS 3301 | Business Intelligence	COP 5910 | Scientific Computing and Programming*
IDC 4942 | Data Analytics Capstone I	Thesis I, Thesis II, and Graduate Project*

Assistant Professor of Applied Mathematics — **St. Thomas University**
Program Director Master of Science in Big Data Analytics*, School of Science* — *August 2016 – July 2018*

Also served as **Mathematics and Data Science Program Coordinator**. Courses taught: (* *indicates graduate courses*)

MAC 1140 | Precalculus	CIS 546 | Data Visualization*
MAC 2311 | Calculus I	CIS 544 | Data Mining and Machine Learning*
CIS 204 | Introduction to Data Science	MAT 602 | Applied Machine Learning*
MAT 502 | Statistical Methods *	CIS 626 | Big Data Analytics Applications*
CIS 543 | Programming for Big Data Analytics*	CIS 627 | Big Data Analytics Capstone*

Assistant Professor of Applied Mathematics — **Wentworth Institute of Technology**
Department of Applied Mathematics — *September 2014 – July 2016*

Taught courses for Applied Mathematics and Engineering majors; served as Academic Advisor for Applied Mathematics students; nominated and served as the Faculty Advisor for the Society of Industrial and Applied Mathematics (SIAM) Student Chapter; coordinated multiple sections of MATH 2860; reviewed and developed material for MATH 1900, MATH 3700, and MATH 5000; and was member of the Science Committee for the BS in Engineering program.
Courses taught:

MATH 1500 | Precalculus	MATH 2800 | Finite Math
MATH 1850 | Engineering Calculus II	MATH 2860 | Linear Algebra and Matrix Theory
MATH 1900 | Introduction to Operations Research	MATH 2500 | Differential Equations
MATH 2025 | Multivariable Calculus	MATH 3700 | Operations Research
MATH 2300 | Discrete Math	MATH 5000 | Applied Math Final Year Design I

Postdoctoral Researcher — **The University of Texas at El Paso**
Department of Mathematical Sciences — *June 2013 – August 2014*

Postdoctoral Researcher in the Computational Science Program, for the Army High Performance Computing Research Center (AHPCRC) grant in collaboration with Stanford University.
Advisors : Dr. Miguel Argaez and Dr. Martine Ceberio.
Emphasis: Reduced-order modeling, data analysis and sparse optimization.

- **Adjunct Instructor** — **The University of Texas at El Paso**
  Department of Mathematical Sciences — *January 2013 – December 2013*

  Courses taught: MATH 2301 Mathematics for the Social Sciences II

- **Research Assistant** — **The University of Texas at El Paso**
  Department of Mathematical Sciences — *January 2009 – January 2013*

  Computational Science Program, for the Army High Performance Computing Research Center (AHPCRC) grant. PI: Dr. Miguel Argaez and Dr. Leticia Velazquez.
  – Implementation of conjugate gradient based methods for large KKT systems in constrained optimization.
  – Algorithmic implementation of ℓ_1-optimization problems.
  – Applications in Compressed Sensing, Large Scale Parameter Estimation, and Classification problems.

- **Research Intern** — **Repsol USA, The Woodlands, TX**
  Research and Innovation Geophysics Department — *July 2012*

  Seismic Image Segmentation and classification via Sparse Representation. PI: Dr. G. Larrazabal, Dr. P. Guillen and Dr. M. Argaez.

- **Research Intern** — **Repsol USA, The Woodlands, TX**
  Research and Innovation Geophysics Department — *June 2011 – August 2011*

  Study and implementation of absorbing boundary conditions for the wave equation. Dip and Azimuth angles computation for seismic ray tracing. PI: Dr. German Larrazabal and Dr. Miguel Argaez.

- **Teaching Assistant** — **The University of Texas at El Paso**
  Department of Mathematical Sciences — *Fall 2008 and Fall 2009*

  Grader for MATH 1411 Calculus I, MATH 2300 Discrete Mathematics, MATH 1319 Math in the Modern World, and MATH 3323 Matrix Algebra. Grader and responsible for MATLAB and problem solving sessions in MATH 5345 Numerical Optimization.

- **Teaching Assistant** — **Universidad del Valle. Cali, Colombia.**
  Department of Mathematical Sciences — *January 2007 – June 2008*

  Tutor and Problem Solving Session Leader for Calculus, Linear Algebra, and Differential Equations.

Education

- **Ph.D. Computational Science** — **The University of Texas at El Paso**
  El Paso, TX. United States — *May 2013*
  - Dissertation Title: *"A Convex Optimization Algorithm for Sparse Representation and Applications in Classification Problems"*
  - Advisor: Dr. Miguel Argaez.
  - Area of Study: Sparse Optimization, Dimensionality Reduction. GPA: 4.0/4.0

- **M.S. Computational Science** — **The University of Texas at El Paso**
  El Paso, TX. United States — *May 2011*
  - Thesis Title: *"A Sparse Representation Technique for Classification Problems"*
  - Advisor: Dr. Miguel Argaez.
  - Area of Study: ℓ_1-optimization methods. GPA: 4.0/4.0

- **B.S Mathematics** — **Universidad del Valle**
  Cali, Valle. Colombia — *May 2008*
  - Thesis Title: *"A Hierarchic a Posteriori Estimate for the Approximation of a Nonlinear Elastic Problem"*, Honors Distinction.
  - Advisor: Dr. Jairo Duque.
  - Area of Study: Finite Element Methods for Elasticity Problems. GPA: 4.4/5.0

Relevant Coursework

Computational Methods for Linear Algebra, Numerical Optimization, Numerical Partial Differential Equations, Numerical Analysis, Mathematical and Computer Modeling, Parallel and Concurrent Programming, Advanced Algorithms, Advanced Numerical Optimization, Data Mining and Machine Learning, Digital Signal Processing, Geophysical Inverse Theory.

Awards

- **nanoHUB Champions Program 2021.** nanoHUB NCN Purdue University. *Utilizing Modern Data Exploration and Visualization Tools for STEM Applications and Datasets*
  May 2021, West Lafayette, IN, USA.
- **Ablaze Excellence in Teaching Award.** Florida Polytechnic University 2020 Ablaze Award. *The Excellence in Teaching Award is designed to encourage, reward, and publicly acknowledge sustained excellence in teaching by members of the University's faculty.*
  May 2020, Lakeland, FL, USA.
- **AMI 2020-2021 Seed Award Program.** Florida Polytechnic University Advanced Mobility Institute (AMI). *Enhancing simulation and testing of emergency medical service vehicles in AVs settings.* PI: Dr. Sanchez-Arias, Co-PI: Dr. Centeno
  April 2020, Lakeland, FL, USA.
- **Travel Award.** NSF funded Big Data Spoke Bootcamps. *Data Wrangling and Electronic Health Records Analysis using R.* H. Qin (University of Tennessee at Chattanooga), E. Fong and Z. Miao (Center for Health Systems Innovation at the Oklahoma State University)
  July 29th - Aug 2nd, 2019, Chattanooga, TN, USA.
- **Travel Award.** *NSF CISE Proposal Writing Workshop.*
  April 9-10th, 2018, Alexandria, VA, USA.
- **Travel Award.** *The National Conference on Race and Ethnicity in American Higher Education (NCORE).*
  May 26-30th, 2015, Washington, D.C, USA.
- **Travel Award.** NSF funded NIMBioS Tutorial, *Computing in the Cloud: What Every Computational Life Scientist Should Know.* National Institute for Mathematical and Biological Synthesis (NIMBioS).
  April 6-8th 2014, Knoxville, TN, USA.
- **Travel Award.** NSF Funded Workshop, *Academic Careers Workshop 2014*.
  March 27-30th 2014, Northwestern University, Evanston, IL, USA.
- **Outstanding Ph.D. Dissertation Award Computational Science Program.**
  April 25th, 2014, El Paso, TX, USA.
- **Best Student Interval Paper Award.** *IFSA/NAFIPS Congress 2013.*
  June 24-28th 2013, Edmonton, Canada.
- **Academic Excellence Graduate Student Award** *UTEP College of Science.*
  May 10th 2013, El Paso, TX, USA.
- **Second Place Best Oral Presentation.** *UTEP Graduate Research Expo.*
  November 9th 2012, El Paso, TX, USA.

Publications

- R. W. Batista and R. Sanchez-Arias. "A Methodology for Estimating Hospital Intensive Care Unit Length of Stay Using Novel Machine Learning Tools". In: *Proceedings of the 19th IEEE International Conference on Machine Learning and Applications (ICMLA)*, Miami, FL, 2020, pp. 827-832.
- P. Akioyamen, L. Nicklas, and R. Sanchez-Arias. "A Framework for Intelligent Navigation Using Latent Dirichlet Allocation on Reddit Posts About Opiates". In: *Proceedings of the 4th International Conference on Compute and Data Analysis (ICCDA 2020).* Association for Computing Machinery (ACM), New York, NY, USA, 2020, pp. 190–196.
- R. Sanchez-Arias, R. W. Batista. "Unsupervised Learning on the Health and Retirement Study using Geometric Data Analysis". In: *Proceedings of the 18th IEEE International Conference on Machine Learning and Applications (ICMLA)*, Boca Raton, FL, 2019, pp. 335-340.
- Q. Goss, M. I. Akbas, L. G. Jaimes and R. Sanchez-Arias. "Street Network Generation with Adjustable Complexity Using k-Means Clustering". In: *2019 IEEE SoutheastCon*, Huntsville, AL, USA, 2019, pp. 1-6.
- Sanchez-Arias R., Sole A., Rojas J. "Semi-supervised Learning Methods for Early Prediction and Forecasting of Clinical Deterioration". *Technical Report for MediKos Inc*, 2018.
- Husowitz B., Sanchez-Arias R. "A Machine Learning Approach to Designing Guidelines for Acute Aquatic Toxicity". In:

J Biom Biostat, vol. 8, no. 6. 2017.

- Bonavides-Aguilar C., Sanchez-Arias R., Lanzas C. "Accurate Prediction of Major Histocompatibility Complex Class II Epitopes by Sparse Representation via ℓ_1-minimization". In: *BioData Mining*, vol. 7, 2014.
- Ramirez C., Sanchez R., Kreinovich K., Argaez M. "$\sqrt{x^2+\mu}$ is the Most Computationally Efficient Smooth Approximation to $|x|$". In: *Journal of Uncertain Systems*, vol. 8, no. 3, pp 205-210. 2014.
- Sanchez R., Servin C., Argaez M. "Sparse Fuzzy Techniques Improve Machine Learning". In: *Joint World Congress of the International Fuzzy Systems Association and Annual Conference of the North American Fuzzy Information Processing Society IFSA/NAFIPS*, pp. 531-535. 2013.
- Argaez M., Sanchez R., Ramirez C., "Face Recognition from Incomplete Measurements via ℓ_1-minimization". In: *American Journal of Computational Mathematics AJCM*, vol. 2, no. 4, pp 287-294. 2012.
- Sanchez R., Argaez M., Guillen P. "Sparse Representation via ℓ_1-minimization for Underdetermined Systems in Classification of Tumors with Gene Expression Data". In: *IEEE 33rd Annual International Conference Proceedings of the Engineering in Medicine and Biology Society*, pp. 3362 - 3366. August 2011.
- Guillen P., Martinez-de-Pinson F., Sanchez R., Argaez M., Velazquez L. "Characterization of Subcortical Structures during Deep Brain Stimulation utilizing Support Vector Machines". In: *IEEE 33rd Annual International Conference Proceedings of the Engineering in Medicine and Biology Society*, pp. 7949 - 7952. August 2011.
- Hernandez, M., Olaya, J., Sanchez, R., Ramirez, C., Romero, R., Velazquez, L., Argaez, M. "Performance Comparison of an HPC ℓ_1-optimization algorithm for compressed sensing". In: *IEEE proceedings of Department of Defense High Performance Computing Modernization Program Users Group Conference*, pp. 391-400, June 2011.
- Argaez, M., Ramirez, C., Sanchez, R. "An ℓ_1-algorithm for underdetermined systems and applications". In: *IEEE proceedings of the North American Fuzzy Information Processing Society*, pp.1 - 6. March 2011.
- Velazquez, L., Argaez, M., Sanchez, R., Ramirez, C., Hernandez, M., Culbreth, M., Jameson A. "Hybrid optimization schemes for wing modeling of micro-aerial vehicles". In: *IEEE proceedings of Department of Defense High Performance Computing Modernization Program Users Group Conference*, pp. 149-154. June 2010.

Talks

- "Finding Structure in Reddit With Text Mining and Dimensionality Reduction: the Case of Miscarriage Experiences". *Healthcare Systems Process Improvement Conference*, (Contributed Talk) *Virtual Presentation due to COVID-19 travel restrictions*, February 2021.
- "A Methodology for Estimating Hospital Intensive Care Unit Length of Stay Using Novel Machine Learning Tools". *19th IEEE International Conference on Machine Learning and Applications (ICMLA)*, (Contributed Talk) *Virtual Presentation due to COVID-19 travel restrictions*, December 2020.
- "Teaching science and engineering using Jupyter notebooks", *Summer 2020 Webinar Series Utilizing nanoHUB Tools for Materials Science Education*, (Invited Talk) Virtual Presentation, August 2020.
- "Using Jupyter Notebooks for Data Analysis and Scientific Computing in nanoHUB", *Workshop Series for nanoHUB Florida Users Group*, (Invited Talk) Virtual Presentation, July 2020.
- "Data Science of Social Networks", *St. Thomas University, Library Lecture Series*, (Invited Talk) Miami, FL. April 2018.
- "A Discussion on Data Analytics and Machine Learning Applications for Engineering and Science", *Florida International University, Department of Biomedical Engineering*, (Wallace H. Coulter Lecture Series Invited Talk), Miami, FL. USA. October 2017.
- "Data Science and Big Data Analytics for Social Good", *Marines 4th Civil Affairs Group (CAG) Planning Exercise*, (Invited Talk), Miami, FL. USA. July 2017.
- "A Duality Approach For Sparse Representation In Classification", *SIAM Annual Meeting 2016*, (Contributed Talk), Boston, MA. USA. July 2016.
- "Sparse Representation via l1 optimization and Supervised Learning Applications" (Invited Talk). Department of Biomedical Engineering Seminar. Universidad de los Andes, Bogota, Colombia. July 17, 2014.
- "Sparse Regularization for Data Mining and Approximation" (Contributed Talk). VIII Pan-American Workshop: Applied and Computational Mathematics. Universidad del Norte, Barranquilla, Colombia. July 23, 2014.
- "Sparse Regularization for Data Mining and Approximation" (Invited Talk). Institute of Mathematical Sciences Seminar. Universidad de Antioquia, Medellin, Colombia. July 28, 2014.
- "Introduction to Sparse Optimization and Applications in Machine Learning", *Taller de Avances en Matemática Aplicada y Biomatemática 2013*, Two-day mini-course. (Invited Talk at Universidad Autónoma de Occidente), Cali, Colombia. November 2013.
- "Sparse Representation and Applications in Classification - Keep it sparse, be happy -". *UTEP 2nd Annual Graduate Research Expo*. (Contributed Talk) El Paso, TX, USA. November 2012.

- "Sparse Representation via ℓ_1-minimization for Underdetermined Systems in Classification of Tumors with Gene Expression Data". *IEEE 33rd Annual International Conference Proceedings of the Engineering in Medicine and Biology Society*. (Contributed Talk) Boston, MA, USA. August 2011.
- "An ℓ_1-algorithm for underdetermined systems and applications". *North American Fuzzy Information Processing Society, NAFIPS 2011*. (Contributed Talk) The University of Texas at El Paso, TX USA. March 2011.
- "Hybrid Optimization for Parameter Estimation Problems". *The International Conference for High Performance Computing (SC10)*. (Invited Talk) Demonstration at AHPCRC booth. New Orleans, LA USA. November 2010.
- "Hybrid Optimization Schemes for Parameter Estimation Problems". *Army High Performance Research Computing Center (AHPCRC) Annual Review*. (Contributed Talk) Stanford University, Palo Alto, CA USA. July 2010.
- "A Path Following Method for large scale ℓ_1-underdetermined problems". *6th Joint UTEP/NMSU Workshop on Mathematics, Computer Science and Computational Sciences*. (Contributed Talk) The University of Texas at El Paso. El Paso, TX USA. November 2009.
- "A Path Following Method for large scale ℓ_1-underdetermined problems". *XVII Colombian Congress of Mathematics*. (Contributed Talk) Cali, Colombia. August 2009.

Posters

- "Attitudes Towards Hot Lanes Using Dimensionality Reduction And Clustering". (presented by S. Vadlamani and Y. Lou). *Transportation Research Board Annual Meeting*, Washington, DC. January 2020.
- "Unsupervised Learning on the Health and Retirement Study using Geometric Data Analysis". (with R. Batista) *18th IEEE International Conference on Machine Learning and Applications (ICMLA)* , Boca Raton, FL, December 2019.
- "Exploratory analysis of citrus farming amidst the "greening" problem in Polk County, Florida" (presented by Miguel Amaral and Melba Horton). Poster Presentation at the *2019 Florida Academy of Sciences Annual Meeting*, Melbourne, FL. March 2019.
- "Analysis of Microbial Communities Reflect Diel Vertical Migration in the Gulf of Mexico" (presented by Claudia Gorbea). Work with Claudia Gorbea, Amanda Lobato, Kevin Boswell, Pilar Maul, Cole Easson, Jose Lopez. Poster Presentation at the *SACNAS: The National Diversity in STEM Conference*, San Antonio, TX, October 2018.
- "Music Data Mining using Audio Features Extracted from Spotify" (presented by Sandy Benito). Poster presentation at *STU Summer Research Institute 10th Annual Symposium*, Miami Gardens, FL, October 2018. Sandy Benito won *"outstanding poster presentation award"* for this work.
- "Text Mining and Pattern Recognition for Online Reviews" (presented by Maudeline Deus). Poster presentation at *Miami-Dade College Undergraduate Research Symposium*, Miami, FL, September 2018. Maudeline Deus won second-place for *"best poster presentation award"* for this work.
- "A dimensionality reduction and sparse representation approach for classification". *Society for Industrial and Applied Math (SIAM) Annual Meeting 2012*, Minneapolis, MN. July 2012.
- "Project 4-6: Hybrid Optimization Schemes For Parameter Estimation Problems". *Army High Performance Computing Research Center Program Management Board Meeting*, Stanford University, Palo Alto, CA. November 2011.
- "Characterization of Subcortical Structures during Deep Brain Stimulation utilizing Support Vector Machines". *IEEE 33rd Annual International Conference Proceedings of the Engineering in Medicine and Biology Society*, Boston, MA. August 2011.
- "A Sparse Representation Technique for Classification Problems". *7th International Congress on Industrial and Applied Mathematics - ICIAM 2011*, Vancouver, BC Canada. July 2011.
- "An algorithm for constrained ℓ_1-minimization problems and applications". *Sixth Blackwell-Tapia Conference*, Columbus, OH. November 2010.
- "A Path Following Method for large scale ℓ_1-underdetermined problems". *Minority Serving Institutions Research Partnerships Consortium (MSIRPC) Conference*, Baltimore, MD. April 2010.
- "A Path Following Method for large scale ℓ_1-underdetermined problems". *The International Conference for High Performance Computing (SC09)*, Portland, OR USA. November 2009.
- "A Fixed Point Algorithm for ℓ_1 large scale underdetermined systems". *UTEP SACNAS Research Expo 2009*, El Paso, TX. April 2009.
- "Parallel Global Optimization Schemes for Solving Parameter Estimation Problems". *The International Conference for High Performance Computing (SC08)*, Austin, TX. November 2008.

Service

- **Chair, Curriculum and Assessment Committee Data Science and Business Analytics Department.**
  Florida Polytechnic University, Fall 2018 – Present.
- **Member, Graduate Curriculum Council.**
  Florida Polytechnic University, Fall 2018 – Present.
- **Member, Data Science and Business Analytics Faculty Hiring Committee.**
  Florida Polytechnic University, Fall 2018, Spring 2019, Spring 2020, Fall 2020.
- **Member, Scenarios of the Future, COVID-19 Campus Planning Subgroup.**
  Florida Polytechnic University, Spring/Summer 2020.
- **Member, INFORMS Education Outreach Committee**
  INFORMS, Fall 2019 – Present.
- **Member, Evaluation Panel Student Coding Bootcamp**
  Analyze COVID-19 Data with R and Google CoLab (organized by Dr. Qin, UTC), December 2020.
- **Chair, Computer Science Faculty Hiring Committee.**
  St. Thomas University, Spring 2018.
- **Member, General Education Committee.**
  St. Thomas University, Spring 2018.
- **Member, Faculty Lead Dual Enrollment Program.**
  St. Thomas University, Fall 2017, Spring 2018.
- **Member, Dean School of Science Search Committee.**
  St. Thomas University, Spring 2017.
- **Faculty Advisor, SIAM Student Chapter.**
  Wentworth Institute of Technology. Summer 2015 - Summer 2016.
- **Member, Applied Mathematics Faculty Hiring Committee**
  Wentworth Institute of Technology. Spring 2015, Summer 2015, Spring 2016, Summer 2016
- **UTEP Graduate Research Expo Judge.** Fall 2013.
- **UTEP SIAM Student Chapter Vice-president.** Spring 2011 - Spring 2013.

Academic Supervision and Mentoring

Graduate

- *Graduate Advisor* for Gabriel Mantini. *MS in CS Data Science Track*. Florida Polytechnic University.
  Expected graduation: Spring 2022.
- *Graduate Advisor* for Angel Sarmiento. *MS in CS Data Science Track*. Florida Polytechnic University.
  Expected graduation: Fall 2021.
- *Final Project Supervisor* for Greg Dills. *MS in CS Data Science Track*. Florida Polytechnic University.
  Expected graduation: Fall 2021.
  Topic: Association Rule Mining for Spot Rate Quoting Process Improvement.
- *Final Project Supervisor* for Katie Dills. *MS in CS Data Science Track*. Florida Polytechnic University.
  Expected graduation: Fall 2021.
  Topic: Logistics Store Forecast Workspace and Analytics.
- *Thesis Advisor* for Levi Nicklas. *MS in CS Data Science Track*. Florida Polytechnic University.
  Graduation term: Spring 2021.
  Topic: Graph Kernels for Text Mining in Unsupervised Learning.
- *Final Project Supervisor* for Morgan Nibert. *MS in CS Data Science Track*. Florida Polytechnic University.
  Graduation term: Spring 2021.
  Topic: Sentiment Analysis and Clustering for Content Recommendation System Using Microblogging Data.
- *Final Project Supervisor* for Diego De Paula. *MS in CS Data Science Track*. Florida Polytechnic University.
  Graduation term: Spring 2021.
  Topic: Data Mining and Analytics Applications for Interconnected Data Centers in a Smart Campus (collaboration with Facens in Brazil).
- *Thesis Supervisor* for Roberto Batista. *MS in CS Data Science Track*. Florida Polytechnic University.
  Graduation term: Spring 2020.
  Topic: Unsupervised and Supervised Machine Learning Methods for Healthcare Data Sources.
- *Capstone Project Supervisor* for Adam Seevers. *MS in CS Big Data Analytics*. Florida Polytechnic University

Graduation term: Spring 2020.
Topic: Data Analytics and Predictive Modeling for Social Networks Data.

- *Capstone Project Supervisor* for Jonathan Ferrer. *MS in CS Big Data Analytics*. Florida Polytechnic University
Graduation term: Spring 2019.
Topic: Supervised Machine Learning Algorithm for the IB Program Hillsborough County Florida.
- *Capstone Project Supervisor* for Yasshin Lozano. *MS in Big Data Analytics*. St. Thomas University
Graduation term: Summer 2018.
Topic: Development of an Analytics App for the Canvas Learning Management System.
- *Capstone Project Supervisor* for Javier Rojas. *MS in Big Data Analytics*. St. Thomas University
Graduation term: Summer 2017.
Topic: Predictive Modeling and Development of an Early Warning Score for Patient Deterioration.

Undergraduate

- *nanoHUB URE NCN Mentor Summer 2020*. Cindy Nguyen's (Florida Polytechnic University, Data Science) Undergraduate Computational Education Experience with nanoHUB (with Dr. Tanya Faltens, Network for Computational Nanotechnology at Purdue University)
- *Fulbright Canada Killam Fellow Mentor Fall 2019*. Peter Akioyamen's (Western University, Applied Mathematics and Data Science) semester abroad at Florida Polytechnic University.
- *STU Summer Research Institute 2017 and 2018 Mentor and Supervisor*. Eliana Espinosa and Sierra Hawthorne (STU, Math), Jayden Carr (STU, Computer Science), Sandy Benito and Celeste Pereira (STU, Biology), Kevin Osorio, Acxel Vega, Jose Muguira and Sabrina Romero (MDC, Computer Science), Maudeline Deus (MDC, Math)

Professional Affiliations

- Society for Industrial and Applied Mathematics (SIAM).
- Institute for Operations Research and the Management Sciences (INFORMS).
- Institute of Electrical and Electronics Engineers (IEEE).

Technical and Personal Skills

- **Technology:** R, Python, MATLAB, Tableau, UNIX Shell scripting
- **Languages:** English (Fluent), Spanish (Native).

Mohammad Reza Khalghani

Current Position: Assistant Professor at Florida Polytechnic University ***E-mail:*** mkhalghani@floridapoly.edu

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EDUCATION

- **[January 2016– August 2019]** ***Ph.D. in Electrical Engineering-Power (Research Assistant)***, West Virginia University, Department of Electrical and Computer Engineering, Faculty of Engineering, Morgantown, West Virginia.

  Thesis: Resilient Stochastic Control Strategies in Cyber-Physical Microgrids

- **[September 2010–July 2012]** ***M.Sc. in Electrical Engineering-Power***, University of Birjand, Department of Electrical and Computer Engineering, Faculty of Engineering, Birjand, Iran.

  Thesis: Representing of Novel Control and Intelligent Algorithms Methods for Electrical Motors Drive in Normal and Fault Conditions

- **[September 2006– September 2010]** ***B.Sc. in Electrical Engineering-Power***, Sadjad University of Technology, Department of Electrical Engineering, Mashhad, Iran.
  Thesis: Protection Relay Coordination with PSO Algorithm.

RESEARCH AND WORK EXPERIENCES

- **2019 (Fall)- Present,** Assistant Professor at Florida Polytechnic University. (Selected project topics mentioned below:)
  - Teaching undergraduate (including freshman) and graduate students.
  - Conducting research on smart grids and cyber-security, and renewable energy.
  - Advising two Graduate Students for their research theses.
  - Giving services regarding the department outreach, initiating new educational program, serving in different committees, etc.
- **2016- 2019,** Research Assistant in West Virginia University. (Selected project topics mentioned below :)
  - Distributed frequency control in smart grids.
  - Control of power electronic converter-based model of microgrids using artificial intelligence methods.
  - Fast-Charging station for electric vehicles in smart grids.
  - Designing a resilient and stochastic controller for islanded microgrids
- **2014,** Impact of Electric Vehicles on power quality, Iran Ministry of Energy, Khorasan Regional Electric Company (KREC).
  - Impact of electric vehicles on distribution systems.
- **2013-2014,** Applying probabilistic planning approaches in Khorasan province's power system with considering uncertainties, Iran Ministry of Energy, Khorasan Regional Electric Company (KREC).
  - Investigation various probabilistic methods and presenting a literature review about it and finally finding the best strategy for my research.
  - Considering uncertainties in loads, wind power, system elements outages.
  - Implementation this approach on real power system (400 kV, 132 kV) using *DIgSILENT PowerFactory* Software and *DIgSILENT Programming Language (DPL).*
- **2013-2014,** Reliability Assessment of Khorasan Power System with Probabilistic Method, Iran Ministry of Energy, Khorasan Regional Electric Company (KREC).
  - Evaluation of probabilistic reliability indices.
- **2013,** An overview on recent control strategies for grid-connected voltage-sourced inverters, Iran Ministry of Energy, Khorasan Regional Electric Company (KREC).

HONORS AND AWARDS	• **2019**, Best Paper Award of PES General Meeting Conference (Leading conference in power engineering) • **2012-Present,** National Elite Foundation, IRAN, (Highest Institute for Elite People). • **2010-2012,** Ranked **5st** among all students of Power Engineering in MS. (Out of 28). • **2006-2010,** Ranked **1st** and **2nd** among all Power Engineering students in 4 terms during B.S. (Between out of 78, Ranked Top **1%**, **2**%). • **2006-2010,** Ranked **4th** among all students of Power Eng in BS. (Out of 78, Top **5%**). • **2006-2010,** Ranked **10st** among all students of Electrical Eng in BS. (Out of 282, Top **3%**).

TEACHING EXPERIENCES

- **Undergraduate and Graduate Courses (As an Assistant Professor)**
  - **Fall 2019, and 2020,** "IDS 1380- Introduction to Science, Technology, Engineering, Math (STEM)" Florida Polytechnic University. This is a common course for Freshmen.
  - **Fall 2019, and 2020,** "EEL 3287- Renewable Energy and Sustainability", Florida Polytechnic University. This course was offered for junior-level students in electrical engineering, mechanical engineering, physics engineering, and environmental engineering.
  - **Fall 2019, and 2020,** "EEL 4251- Power System Analysis", Florida Polytechnic University. This course was offered for senior level students.
  - **Fall 2020,** "EEL 5250- Power System Analysis", Florida Polytechnic University. This course was offered for graduate students.
  - **Spring 2020,** "EEL 4290- Sustainability for Engineering, Technology and Entrepreneurship", Florida Polytechnic University. I intensively redesigned and reorganized this course that is now can be offered for junior level students with different concentrations and in all engineering departments.
  - **Spring 2020,** "EEL 4283- Renewable Energy Systems", Florida Polytechnic University. This course was offered for Senior level students in electrical engineering and physics engineering.
  - **Spring 2020,** "EEL 5286- Advanced Renewable Energy Systems", Florida Polytechnic University. This course was offered for graduate students.
  - **Spring 2021,** "EGN 1007- Concepts and Methods", Florida Polytechnic University. This freshman level course is an introduction to computer software applications/tools involving engineering data analytics and visualization to solve a variety of engineering-related problems.
  - **Spring 2021,** "EEL 4312- Electric and Hybrid Vehicles", Florida Polytechnic University. This senior level (undergraduate) course focuses on all electric vehicle components and technologies.
- **Undergraduate Courses (As a Lecturer)**
  - **Fall 2015,** "Power Electronic" & "Electric Energy Systems I" Sadjad University of Technology.
  - **Fall 2013,** "Special Machines", Shandiz Institute of Higher Education.
  - **Fall 2013,** "Logic Circuits and Digital Design", Sadjad University of Technology.
  - **Fall 2013,** "Power Electronics" Laboratory, Sadjad University of Technology.
  - **Fall 2012-Winter 2014,** "Electrical Machines I" Laboratory, Shandiz Institute of Higher Education**.**
  - **Spring 2012- Spring 2014,** "Electrical Machines II" Laboratory, Shandiz Institute of Higher Education**.**
  - **Spring 2011- Spring 2012,** "Electrical Machines" Laboratory, University of Birjand.
- **Undergraduate Teaching Assistant:**
  - **Fall 2008- Spring 2010, "Electrical Machines** I", Sadjad University of Technology**.**
  - **Spring 2009,** "Power System Analysis", Sadjad University of Technology.

ACADEMIC ACTIVITIES	• Leading the "Emerging Technology" subgroup in Joint IEEE PES-NERC Technical Report on Integration of Cyber and Physical Security into Bulk Power System Planning, Operations, Design, and Restoration Activities. • Secretary-Elect of IEEE PES Power & Energy Education Committee (PEEC). • Review Editor for Power Electronics (Frontiers in Electronics) • Technical Program Assistant in North American Power Symposium (NAPS), 2017. • Reviewer of IEEE Transaction on Smart Grids. • Reviewer of IEEE Transaction on Industrial Electronics. • Reviewer of IEEE Transaction on Vehicular Technology. • Reviewer of Journal of Applied Energy. • Reviewer of Journal of Sustainable Cities and Society. • Reviewer of Journal Engineering Applications of Artificial Intelligence • Reviewer of Journal of Energies (MDPI). • Reviewer of Journal of Sustainability (MDPI). • Reviewer of Journal of Neural Computing and Applications (NCAA). • Reviewer of Journal Sustainable Cities and Society. • Reviewer of PES General Meeting Conference. • Reviewer of Optimal Control, Applications and Methods. • Reviewer of International Journal of Hydrogen Energy. • Reviewer of International Journal of Power and Energy Systems. • Reviewer of Journal of Vibration and Control. • Reviewer of Turkish Journal of Electrical Engineering & Computer Sciences. • Reviewer of Journal of Nonlinear Dynamics, Springer Ltd. • Reviewer of Journal of Electrical Engineering & Technology. • Reviewer of SouthEastCon 2020 conference. • Reviewer of IEEE Symposium on Computers & Informatics Conference. • Reviewer of IEEE International Conference on Computer Applications and Industrial Electronics (ICCAIE).
PUBLICATIONS	**<u>Journal Papers:</u>** **1.** **M. R. Khalghani,** J. Solanki, S. Solanki, M. H. Khooban and A. Sargolzaei, "Resilient Frequency Control Design for Microgrids Under False Data Injection," in IEEE Transactions on Industrial Electronics, vol. 68, no. 3, pp. 2151-2162, March 2021. **2.** **M. R. Khalghani**, J. Solanki, S. Khushalani Solanki and A. Sargolzaei, "Stochastic Secondary Frequency Control of Islanded Microgrid Under Uncertainties," in IEEE Systems Journal, doi: 10.1109/JSYST.2020.3014642. **3.** P. T Alluri, H. Ul-Banna, **M. R. Khalghani,** J. Solanki, and S. Khushalani Solanki, "Real-Time Framework for Monitoring Cyber Disruptions in Power Grids," in IEEE Transactions on Industrial Informatics, 2021, ACCEPTED. **4.** M. Victorio, A. Sargolzaei, **M. R. Khalghani**, "A Secure Control Design for Networked Control Systems with Linear Dynamics Under Time Delay Switch Attack" Electronics, 10(3):322. https://doi.org/10.3390/electronics10030322. **5.** V. S. Kasani, D. Tiwari, **M. R. Khalghani,** S. Khushalani Solanki, and J. Solanki, " Optimal Coordinated Charging and Routing Scheme of Electric Vehicles in Distribution Grids: Real Grid Cases," in Sustainable Cities and Society, Under Review. **6.** **M. R. Khalghani**, M. H.Khooban,E. Mahboubi-Moghaddam, N. Vafamand and M. Goodarzi, "A self-tuning load frequency control strategy for microgrids: Human brain

emotional learning," International Journal of Power and Energy Systems, Vol. 75, pp. 311–319, February 2016.

7. **M. R. Khalghani**, M. Ramezani, and M. Rajabi-Mashhadi, "Demonstrating the Importance Of Applying A New Probabilistic Power Flow Strategy To Evaluate Power Systems With High Penetration Of Wind Farms," Journal of Energy Engineering-ASCE, 10.1061/(ASCE)EY.1943-7897.0000332, 04016002, 2016.
8. H. Heydari-Doostabad, **M. R. Khalghani**, M. H. Khooban, "A Novel Control System Design to Improve LVRT Capability of Fixed Speed Wind Turbines using STATCOM in Presence of Voltage Fault," International Journal of Power and Energy Systems, Vol. 77, pp. 280-286, 2016.
9. M. R. Soltanpour, M. H. Khooban, **M. R. Khalghani**, "An Optimal and Intelligent Control Strategy for a Class of Nonlinear Systems: Adaptive Fuzzy Sliding Mode," Journal of Vibration and Control, Vol. 22, Issue 1, pp. 159-175,2016.
10. **M.R. Khalghani**, and M.H. Khooban, "A Novel Self-Tuning Control Method Based on Regulated Bi-objective Emotional Learning Controller's Structure with TLBO Algorithm to Control DVR Compensator," Journal of Applied Soft Computing, Vol. 24, pp. 912–922, November 2014.
11. **M.R. Khalghani**, M.A. Shamsi-nejad and M. H. Khooban**,** "DVR Control Using Bi-objective Optimization to Improve Power Quality's Indices," IET Science, Measurement & Technology, Vol. 8, Issue 4, pp. 203–213, 2014.
12. **M.R. Khalghani**, M.A. Shamsi-nejad, M. Farshad and M.H. Khooban, "Modifying power quality's indices of load by Presenting an Adaptive Method Based on Hebb Learning Algorithm for Controlling DVR," AUTOMATIKA–Journal for Control, Measurement, Electronics, Computing and Communications, Vol. 55, No 2, 2014.
13. H. Heydari, R. Keypour, **M. R. Khalghani** and M.H. Khooban**,** "A new approach in MPPT for photovoltaic array based on Extremum Seeking Control under uniform and non-uniform irradiances," Solar Energy Journal, Elsevier, Vol. 94, pp. 28–36, 2013.
14. M.A. Shamsi-nejad, **M. R. Khalghani** and M.H. Khooban, "Determination of Optimum Hysteresis Bandwidth to Improve Electric Machines Operation," Journal of Power Technologies, Vol. 93, No 4, 2013.

Conference Papers:

15. **M. R. Khalghani**, M. Ramezani and M. R. Mashhadi, "Probabilistic Power Flow Based on Monte-Carlo Simulation and Data Clustering to Analyze Large-Scale Power System in Including Wind Farm," 2020 IEEE Kansas Power and Energy Conference (KPEC), Manhattan, KS, USA, pp. 1-6, 2020.
16. **M. R. Khalghani**, J. Solanki, S. Khushalani-Solanki and A. Sargolzaei, "Resilient and Stochastic Load Frequency Control of Microgrids," IEEE PES General Meeting, Atlanta, pp. 1-5, 2019.
17. **M. R. Khalghani**, J. Solanki, S. Khushalani-Solanki and A. Sargolzaei, "Stochastic Load Frequency Control of Microgrids Including Wind Source Based on Identification Method," 2018 IEEE International Conference on Environment and Electrical Engineering and 2018 IEEE Industrial and Commercial Power Systems Europe (EEEIC / I&CPS Europe), Palermo, pp. 1-6, 2018.
18. **M. R. Khalghani**, S. Solanki, and J. Solanki, "A Load Frequency Control for Microgrid including Stochastic Elements Based on Hebb Learning,"2017 North American Power Symposium (NAPS), Morgantown, WV, 2017, pp. 1-6.
19. **M. R. Khalghani**, S. Solanki, J. Solanki, A. Sargolzaei, "Cyber Disruption Detection in Linear Power Systems,"2017 North American Power Symposium (NAPS), Morgantown, WV, 2017, pp. 1-6.
20. **M. R. Khalghani**, S. Solanki, and J. Solanki, "Optimal Integration and Location of PHEV Aggregators in Power Distribution Systems,"2016 North American Power Symposium (NAPS), Denver, CO, 2016, pp. 1-6.

21. **M. R. Khalghani**, and M.A. Shamsi-nejad, “A novel self-tuning control structure to control DVR compensator using bi-objective human brain Emotional learning,” 20th Electric Power Distribution Conference (EPDC), Zahedan, Iran, 2015.
22. H. Heydari-Doostabad, R. Keypour, N. Eskandarian, **M.R. Khalghani**, “New fuzzy control system design for maximum power point tracking of wind turbine,” 18th Electric Power Distribution Conference (EPDC), Kermanshah, Iran, 2013.
23. M.A. Shamsi-nejad, M. A. Zamen, M. Dadgar, T. Vahidi, **M.R. Khalghani**, “Bi-Objective Regulating of DVR Compensator To Modify Power Quality's Indices Of Load,” 22nd International Conference on Electricity Distribution (CIRED), Stockholm, June 2013.
24. M.A. Shamsi-nejad, **M.R. Khalghani**, “DVR control using adaptive PI controller based on human brain learning,” Proceedings of 17th Conference on Electric Power Distribution Conference (EPDC), Tehran, Iran, 2012.
25. **M.R. Khalghani**, M.A. Shamsi-nejad, K. Beyki, “An Intelligent Controller for Optimal Vector Control of Induction Motor,” IEEE International Conference on International Conference on Computer Applications and Industrial Electronics (ICCAIE), PP. 78-81, Penang, Malaysia, 2011.

Book (Chapter):

26. **M. R. Khalghani**, S. Khushalani-Solanki and J. Solanki, “Load Frequency Control in a Microgrid Including Electric Vehicle Using Neuroscience Based Controllers”, Book Title: Microgrids: Design, Applications and Control, Nova Science Inc., 2018.

Posters/Presentations:

27. **M. R. Khalghani** (Author & Presenter), S. Khushalani-Solanki, IEEE PES General Meeting 2017, "Stochastic Observer Design for a Microgrid under Cyber Disruptions." (July 19, 2017).
28. **M. R. Khalghani** (Author & Presenter), S. Khushalani-Solanki (Author), J. Solanki (Author), IEEE PES General Meeting 2016, "New Control Structure for Load Frequency Control of a Hybrid AC/DC Microgrid,” (July 20, 2016).
29. **M. R. Khalghani** (Author & Presenter), S. Khushalani-Solanki (Author), J. Solanki (Author), TransTech Energy Congress 2016, "Optimal Scheduling and Placing of PHEV Aggregators in Three Phase Distribution Grids," (Oct. 23, 2016)

FIELDS OF INTERESTS

- Smart Grids and Cyber-Security
- Modeling and Control of Converter-Based Microgrids
- Renewable Energy Integration
- Electric Vehicle Design and Integration

GRANTS AND FUNDING

- **Project Title:** Resilient Integration and Control Design of Mobile Emergency Resources to Microgrids.
  - **PI:** Dr. Mohammad Reza Khalghani
  - **Funder:** The Woodrow W. Everett, Jr. SCEEE Development Fund
  - **Date:** from July 1, 2020 to June 30, 2021
  - **Awarded Amount:** $60,000 (Main Award: $55,000; REU Supplement: $5,000)
- **Project Title:** Use of Renewable Energy-based Autonomous Vehicles for COVID-19 Related Problems.
  - **PI:** Dr. Mohammad Reza Khalghani, Co-PI: Dr. Onur Toker
  - **Funder:** Advanced Mobility Institute (AMI)
  - **Date:** from August 1, 2020 to July 31, 2021
  - **Awarded Amount:** $14,000

SERVICE AND CAREER DEVELOPMENT	• Defining project topics for *Senior Design Project* and supervising students for their projects. • Facilitating the laboratory of "smart grid, power systems, and renewable energy". • Actively participated in curriculum development for new program of "Cyber Security Engineering" which we will start Fall 2021. • Developed a proposal and syllabus for the new course of "Smart Grid and Cyber Security" that we need for the new program of cyber-security engineering. • Serving as the contact faculty (EE Faculty Mentor Advising) of "Renewable Energy" and "Autonomous and Electric Vehicle" concentrations. • Serving in the ECE curriculum committee at Florida Polytechnic University. • Serving in the ECE research committee at Florida Polytechnic University. • Served in the strategic planning committee at the ECE department of Florida Polytechnic University. • Serving in the Employee Activity committee at Florida Polytechnic University.
REFERENCES	• Sarika Khushalani Solanki, Ph.D., Associate Professor of Lane Department of Computer Science and Electrical Engineering, West Virginia University. Email: Sarika.Khushalani-Solanki@mail.wvu.edu • Jignesh Solanki, Ph.D., Research Assistant Professor of Lane Department of Computer Science and Electrical Engineering, West Virginia University. Email: jignesh.solanki@mail.wvu.edu • Arman Sargolzaei, Ph.D., Assistant Professor of Mechanical Engineering Department, Tennessee Tech University. Email: asargolzaei@tntech.edu • Mohammad Hassan Khooban, Ph.D., Assistant Professor of Department of Engineering-Electrical and Computer Engineering, University of Aarhus, Denmark. Email: khooban@eng.au.dk • Navid Khoshavi Najafabadi, Ph.D., Assistant Professor of Electrical and Computer Engineering Department, Florida Polytechnic University. Email: nkhoshavinajafabadi@floridapoly.edu

Cell: +1-(561)-344-9119
E-mail: amalinin2018@fau.edu
https://sites.google.com/view/artemmalinin/

ARTEM MALININ

TEACHING INTERESTS

- Investments, Corporate Finance, Financial Modeling, International Finance, Financial Institutions

RESEARCH INTERESTS

- Investments (bond mutual funds, stocks), Corporate Finance (social networks, boards), Entrepreneurial Finance (diversity, performance), International Finance (law, politics), Financial institutions (crises, lending)

EDUCATION

Florida Atlantic University, Boca Raton, Florida (*August 2018 – present)*

- Ph.D. Candidate in Finance, dissertation proposal date: 09/03/2021, expected graduation date: 05/2022
- Dissertation committee: Dr. Luis Garcia-Feijoo (chair), Dr. David Javakhadze, Dr. Anita Pennathur
- Dissertation in progress (2 essays): "Stock Price Informativeness and Social Capital: US perspective" (job market paper, accepted at Boca Corporate Finance and Governance Conference 2021, New Zealand Finance Meeting 2021, and Southwestern Finance Association Meeting 2022), "Stock Price Informativeness and Social Capital: international perspective"
- Presidential Fellowship (2018-2021)

University of Houston-Downtown, Houston, Texas (*August 2016-August 2017)*

- Master of Business Administration, Concentration: Finance, GPA: 3.92
- Graduate Certificate in Finance
- Member of National Honor Society of International Financial Management Association (FMA)
- Member of the international business honor society Beta Gamma Sigma

Bauman Moscow State Technical University, Russia (*September 2004 – June 2010)*

- Bachelor of Science in Financial Management in Business (Hons.)
- Diploma work on the topic "Forecasting of bankruptcies"
- Best Student of 2010 according to McKinsey

COURSES TAUGHT

- High overall teaching effectiveness from SPOT Instructor Evaluation report: student evaluation;1=best, 5=worst
- Cases in Financial Management (Summer 2021): 1.59
- Advanced Managerial Finance (Spring 2021): 1.72
- Financial Institutions (Spring 2021): 2.11

WORKING PAPERS

- "Sources of herding in bond mutual funds"
- "Style drift in bond mutual funds"

- “Droughts impact on banks’ lending in the US”
- “Board characteristics and company’s performance”
- “Founders traits, board characteristics, and entrepreneurial success”

CONFERENCE PARTICIPATION

- Presenter: Southwestern Finance Association (SWFA) 2021 meeting, Boca Corporate Finance and Governance Conference 2021, New Zealand Finance Meeting 2021, Southwestern Finance Association (SWFA) 2022 meeting
- Reviewer: SFA 2021 conference, Journal of Management Education
- Chair: Southwestern Finance Association (SWFA) 2021, Southern Finance Association (SFA) 2021, Boca Corporate Finance and Governance Conference 2020/2021, Southwestern Finance Association (SWFA) 2022
- Discussant: Southwestern Finance Association (SWFA) 2021, Southern Finance Association (SFA) 2021, Financial Management Association (FMA) 2021, Boca Corporate Finance and Governance Conference 2020/2021, New Zealand Finance Meeting 2021, Southwestern Finance Association (SWFA) 2022

PROFESSIONAL EXPERIENCE

University of Houston-Downtown College of Business, Houston, Texas
Finance Tutor (*December 2017 – July 2018)*

- Help MBA and undergraduate students with finance, economics, accounting, and management

Deep Energy, Houston, Texas
Financial Analyst (*September 2017 – December 2017)*

- Set up, maintain, and improve financial processes and models
- Provide overall support in financial monitoring and cost control

Houston Technology Center, Houston, Texas
Intern (*September 2016 – February 2018)*

- Produce financial modeling, budgeting reports, and due diligence for startups
- Best Intern award recipient

Aeroflot Russian Airlines, Moscow, Russia
Chief Analyst (*June 2012 – September 2015)*
Project Manager (*September 2015 – June 2016)*

- Prepare financial forecasts, managerial accounting reports
- Supervise team of 25 managers abroad

ISG Consulting, Moscow, Russia
Management Consultant (*March 2011 – June 2012)*

- Optimize budgeting, organizational structures, and incentive programs
- Most productive consultant award recipient

Troika Dialog Investment Bank, Moscow, Russia
Investment Reporting Analyst (*July 2008 – March 2011)*

- Prepare bond offering memoranda
- Implement and administrate SAP and Oracle databases

ENTREPRENEURIAL ACCOMPLISHMENTS

- Coach more than 25 students during 7 years of private tutoring
- Organize own successful educational business with more than 200 customers

TECHNICAL SKILLS

- STATA, SAS, SPSS, Bloomberg
- MS Excel, Visio, Word, Access, Power Point, Project, Outlook
- Visual Basic for Applications (VBA), C, Pascal, HTML, SQL
- SAP Crystal Reports, Actuate Analytics, Jira, Oracle Siebel 7.5 and 8.0
- MIDT Sabre, Salesforce, BSPlink, Google Analytics

CERTIFICATIONS

- FINRA SIE
- Bloomberg Market Concepts certificate (BMC), Top 10% investors (Investopedia)
- Lean Six Sigma White Belt certificate, CFI "Excel crash course" certificate
- MS Excel and MS Access certificates
- Russian Federal Financial Markets Service (FFMS) professional certificates 1.0 and 5.0 (in managing investment funds)
- Business negotiations certificate

REFERENCES

Luis Garcia-Feijoo, Ph.D. (Chair)
Associate Professor of Finance
College of Business
Florida Atlantic University
Phone: 954-236-1239
Email: luis.garcia@fau.edu

Anita Pennathur, Ph.D.
Stone Fellow & O'Maley Distinguished Professor
College of Business
Florida Atlantic University
Phone: (954) 236-1272
Email: pennathu@fau.edu

David Javakhadze, Ph.D.
Associate Professor of Finance
College of Business
Florida Atlantic University
Phone: 561-297-2914
Email: djavakhadze@fau.edu

Dear Members of the Hiring Committee,

I am writing to apply for the Assistant Professor of Business Analytics position at Florida Polytechnic University.

ELISABETH KAMES, Ph.D.

Professional Contact
4700 Research Way
Department of Mechanical Engineering
Lakeland, FL. 33805

Personal Contact
1720 Hamilton Ave. SW
Palm Bay, FL. 32908
Cell: (630) 476 -1265

EDUCATION

Ph.D., Mechanical Engineering May 2020
Florida Institute of Technology Melbourne, FL
Dissertation: Examining the Impact of Student Motivation on Performance in Mechanical Engineering Design Courses
Advisor: Beshoy W. Morkos, Ph.D.

M.S., Mechanical Engineering December 2016
Florida Institute of Technology Melbourne, FL
Concentration in Dynamic Systems, Robotics and Controls

B.S., Mechanical Engineering (cum laude) May 2015
Florida Institute of Technology Melbourne, FL

ACADEMIC APPOINTMENTS

Florida Polytechnic University Lakeland, FL.
Assistant Professor March 2021 – Present

Florida Polytechnic University Lakeland, FL.
Visiting Assistant Professor August 2020 – March 2021

Florida Institute of Technology Melbourne, FL.
Visiting Instructor August 2019 – May 2020

ACADEMIC EXPERIENCE

Florida Polytechnic University Lakeland, FL.
Assistant Professor March 2021 – present

- Serve as an assistant professor in the Department of Mechanical Engineering
- Conducting research on persistence and retention in mechanical engineering

Florida Polytechnic University Lakeland, FL.
Visiting Assistant Professor August 2020 – March 2021

- Served as a visiting assistant professor in the Department of Mechanical Engineering for the 2020-2021 academic year
- Taught three courses during the fall semester and three courses in the spring semester
- Conducting research on persistence and retention in mechanical engineering

Florida Institute of Technology Melbourne, FL.
Visiting Instructor August 2019 –May 2020

- Served as a visiting instructor in the Department of Mechanical and Civil Engineering for the 2019-2020 academic year
- Taught, as the instructor on record, seven different courses throughout the year to over 300 students
- Secured $60K in industry funding for student capstone projects

Florida Institute of Technology Melbourne, FL.
Graduate Research Assistant May 2015 – May 2020

- Worked with Dr. Beshoy Morkos on industry (~$300K) and federally (~$1M) funded projects. Work included

learning how to write grants, executing the research, and leading multiple research teams.
- Developed research tools, methods, and techniques as part of research findings.
- Presented work at multiple American Society for Engineering Education (ASEE) Annual Conferences (where some of my papers were selected as the best within division), American Society of Mechanical Engineers International Design Engineering Technical Conferences & Computers and Information in Engineering Conference (ASME IDETC/CIE)
- Published work in relevant journals such as the International Journal of Engineering Education

PROFESSIONAL EXPERIENCE

Engineer in Training No. 1100022752, Florida 2019

Structural Composites/Compsys, Inc. Melbourne, FL.

Composite Engineering Intern 2016 – 2019
- Designed and developed machinery to facilitate and automate composite manufacturing projects
- Developed and manufactured tooling for projects for the U.S. Navy, Lockheed Martin, and Wabash National Corporation

TEACHING EXPERIENCE

Instructor on record: 11 unique courses
Graduate Assistant: 8 unique courses

Florida Polytechnic University – Mechanical Engineering Lakeland, FL.

Professor – EGN 2002C – Skills and Design 2 Spring 2021
- Taught two sections of Skills and Design 2
- Lectured to freshman/sophomore level students on the fundamentals of design and manufacturing
- Overviewed the importance of Geometric Dimensioning and Tolerancing on part creation
- Organized and executed a small design project (miniature catapults) to showcase dynamics principles

Professor – EML 3811 – Mechatronics Spring 2021
- Taught EML 3811 to upper-level undergraduate students in a FLEX modality
- Topics included sensors and signal conditioning, digital signals and logic, actuation, first-order and second-order engineering system models, and transfer functions
- Delivered class syllabus, material, homework problems, quizzes, exams, and semester project

Professor – EGN 2001C – Skills and Design 1 Fall 2020/Fall 2021
- Taught two sections of Skills and Design 1 in two different modalities (online and FLEX section)
- Lectured to freshman/sophomore level students on the fundamentals of design
- Facilitated the use of Solidworks for 3D modeling and design
- Organized and executed a small manufacturing project (manila folder bridge) to showcase statics principles

Professor – EML 4500 – Design and Analysis of Machine Components Fall 2020/Fall 2021
- Taught EML 4500 during the fall semester to 18 undergraduate students in a FLEX modality
- Educated students on the fundamentals of the design of basic machine elements, emphasizing failure prevention for static and variable loading scenarios
- Topics included permanent and nonpermanent joints, springs, bearings, gears, clutches, flywheels, and geometric dimensioning and tolerancing
- Prepared class syllabus, material, homework problems, quizzes, exams, and semester project

Florida Institute of Technology – Mechanical Engineering Melbourne, FL.

Instructor – MEE 4193/4194 – ME Design 1 & 2 (Capstone Design) Fall 2019/Spring 2020
- Secured $60K in competitive funding (not donations) to support industry funded student projects
- Organized student project teams based on student skillsets and interests
- Procured funding from 4 industry sponsors for student projects
- Oversaw 109 students on 11 different senior capstone design teams

- Lectured on engineering design and proper design procedures

Instructor – MEE 4190 – Design Methodologies (Junior Design) Spring 2020

- Taught MEE 4190 during the spring semester to 84 undergraduate students
- Assigned student project teams based on student skillsets and interests
- Prepared class syllabus, material, homework problems, and three miniature, group projects to prepare students for capstone design

Instructor – MEE 3090 – Design of Machine Elements Fall 2019

- Taught MEE 3090 during the fall semester to 56 undergraduate students
- Lectured and educated students on the fundamentals of engineering mechanics and the design of basic machine elements, emphasizing failure prevention
- Prepared class syllabus, material, homework problems, quizzes, exams, and semester project

Instructor – MEE 1025 – ME Practicum 1 Fall 2019

- Lectured to freshman level students on the fundamentals of the design process and design principles
- Advised students on their project work, interfacing with senior level students to assist with capstone design

Instructor – MEE 2025 – ME Practicum 2 Fall 2019

- Lectured to sophomore level students on the fundamentals of the design process and design principles
- Advised students on their project work, interfacing with senior level students to assist with capstone design

Instructor – MEE 3025 – ME Practicum 3 Fall 2019

- Lectured to junior level students on the fundamentals of the design process and design principles
- Advised students on their project work, interfacing with senior level students to assist with capstone design projects

Graduate Teaching Assistant Fall 2015 – Spring 2019

- Served as a teaching assistant to multiple engineering courses at all curriculum levels
- Classes included: Statics, Dynamics, Computer Aided Engineering, Design Methodologies, Mechanical Vibrations, Control Systems, Mechanical Engineering Design 1, and Mechanical Engineering Design 2

Graduate Advisor – MEE 4193/MEE 4194 – Senior Capstone Design Fall 2015 – Spring 2019

- Advised multiple student teams as a Graduate Student Advisor for Mechanical Engineering Design 1 and 2
- Interfaced with over 50 student teams (~400 students)
- Interfaced with both industry and federal industry sponsored project liaisons
- Completed ordering, oversaw student project progress, and advised students to successful project completion

PUBLICATIONS

Journal Publications (2 published, 2 accepted pending revision, 6 in preparation)

1. Hein, P.H., **Kames, E.**, Cheng, C. Morkos, B. (2021), Employing Machine Learning Techniques to Assess Requirement Change Volatility. *Research in Engineering Design*, 32(2), 245-269 doi: 10.1007/s00163-020-00353-6
2. **Kames, E.**, Morkos, B., Bessette, A. (2019), The Implementation of an Intervention Plan to Improve Student Motivation and Performance in Mechanical Engineering Senior Design Capstone. *International Journal of Engineering Education*. Volume 35, No. 3, pp. 779-794
3. Shah, D., **Kames, E.,** Morkos, B. Neurocognitive Effects of Incentivizing Students to Improve Performance through Repeat Attempts, Journal of Computing and Information Science in Engineering (*Revisions)*
4. Hein, P.H., **Kames, E.,** Morkos, B., Exploring Artificial Neural Networks and Complex Network Metrics to Predict Requirement Change Volatility, Journal of Mechanical Design *(Revisions).*
5. **Kames, E.,** Shah, D., Morkos, B. A Mixed Methods Analysis Examining the Impact of Motivation Factors in Senior Capstone Design Courses. Journal of Engineering Education *(In preparation)*
6. **Kames, E.,** Shah, D., Morkos, B. Examining the Impact of Student Motivation Factors on Performance and Persistence in Design Courses. Journal of Engineering Education *(In preparation)*
7. Shah, D., **Kames, E,** Morkos, B., Student Motivation in Engineering Capstone Design: A Convergent Mixed Methods Study Comparing Industry and Non-Industry Sponsored Projects. Journal of Mechanical Design (JMD-21-1088) (*Revisions*)

8. Hein, P.H., **Kames, E.,** Morkos, B., Investigation of Requirement Change Propagation using Complex Network Metrics and Network Interference Method, Journal of Mechanical Design *(In preparation)*
9. Shah, D., **Kames, E.**, Clark, M., Development of an Interview Protocol and Formal Coding Scheme for use in Qualitative Data Collection in Design Courses, Journal of Mechanical Design *(In preparation)*
10. Hein, P.H., **Kames, E.,** Morkos, B., Computational Support for Predicting Requirement Change Volatility using Complex Network Metrics, Journal of Mechanical Design *(In preparation).*

Conference Proceedings (12 published, 1 in preparation)

1. **Kames, E.**, Shah, D., Morkos, B. Examining the Effect of Negative Design Stimuli on Perception of Peer Contribution in Design Settings. (*In preparation for the 2022 ASEE Annual Conference & Exposition)*
2. Shah, D., **Kames, E.**, Morkos, B. (2021) Neurocognitive Effects of Incentivizing Students to Improve Performance through Repeat Attempts in Design Settings. ASME International Design Engineering Technical Conferences and Computers and Information in Engineering Conference.
3. Shah, D., **Kames, E.**, Morkos, B. (2021) Impact of Educators Changing Student Motivation: A Study of Transient Factor Correlation and Orthogonality. Paper presented at the 2021 ASEE Annual Conference & Exposition, Virtual.
4. **Kames, E.**, Shah, D., Clark, M., Morkos, B. (2019), A Mixed Methods Analysis of Motivation Factors in Senior Capstone Design Courses. Paper presented at 2019 ASEE Annual Conference & Exposition, Tampa, Florida. ***(selected as one of the top 5 papers in Division out of >120 submission)***
5. Shah, D., **Kames, E.**, Clark, M., Morkos, B. (2019), Examining the Differences in Student Motivation for Industry Projects in Senior Capstone Design. Paper presented at 2019 ASEE Annual Conference & Exposition, Tampa, Florida.
6. Shah, D., **Kames, E.**, Clark, M., Morkos, B. (2019), Development of a Coding Scheme for Qualitative Analysis of Student Motivation in Senior Capstone Design. ASME. International Design Engineering Technical Conferences and Computers and Information in Engineering Conference.
7. Clark, M., Shah, D., **Kames, E.**, Morkos, B. (2019), Developing Interview Protocol for Engineering Capstone Design Courses. ASME. International Design Engineering Technical Conferences and Computers and Information in Engineering Conference.
8. Madison, A., Koren, K., **Kames, E.**, Morkos, B. (2019), Examining the Effect of Friction During Dry Sliding on Select Thermoplastics. ASME. International Design Engineering Technical Conferences and Computers and Information in Engineering Conference.
9. **Kames, E.**, Shah, D., Morkos, B. (2018), A Longitudinal Study Exploring Motivation Factors in Cornerstone and Capstone Design Courses. Paper presented at 2018 ASEE Annual Conference & Exposition, Salt Lake City, Utah.
10. **Kames, E.**, Thiess, D., Morkos, B. (2018), Learning by Doing: A Simple Educational Method for Modelling Vehicle Suspensions. ASME International Design Engineering Technical Conferences and Computers and Information in Engineering Conference.
11. **Kames, E.**, Thiess, D., Kepinski, P., Zaremba, R., Morkos, B. (2018), Simulating Occupant Response to Low Speed, Automotive Rear-End Collisions. ASME International Design Engineering Technical Conferences and Computers and Information in Engineering Conference.
12. **Kames, E.**, Zaremba, R., Morkos, B. (2017), Analyzing Composite Material Manufacturing Methods Using Failure Modes Effect Analysis. ASME International Design Engineering Technical Conferences and Computers and Information in Engineering Conference.
13. Schmitt, E., **Kames, E.**, Morkos, B., Conway, T. A. (2016), The Importance of Incorporating Designer Empathy in Senior Capstone Design Courses. Paper presented at 2016 ASEE Annual Conference & Exposition, New Orleans, Louisiana.

Poster Sessions (1 posters)

1. **Kames, E.**, "Examining the Effect of Student Motivation on Academic Performance in Design Courses," *ASME International Design Engineering Technical Conference*, Quebec City, Quebec, 2018.

Award Papers (3 papers)

1. **Kames, E.,** "Addressing the Possibilities: The Benefits of the Implementation of Artificial Intelligence in Engineering Design Education," ASEE Annual Conference, Tampa, FL, 2019.
2. **Kames, E.**, "Next Generation Robotic Applications for Design and Manufacturing," ASME International Design Engineering Technical Conference, Cleveland, OH, 2017.
3. **Kames, E.** and Patel, D., "Internet of Things in Manufacturing," ASME International Design Engineering Technical Conference, Charlotte, NC, 2016.

FUNDING SECURED

Total: $60,000 (Kames as PI: $60,000)

- **Kames, E.,** (PI), 2019, "Design of Beam Data Scanning System – Phase II", **Sun Nuclear Corporation**, $15,000
- **Kames, E.,** (PI), 2019, "Design and Analysis of Complex System" (Title Removed for Restrictions), **Lockheed Martin**, $15,000
- **Kames, E.,** (PI), 2019, "Design and Analysis of Complex System" (Title Removed for Restrictions), **US Navy**, $15,000
- **Kames, E.,** (PI), 2019, "System Optimization Through Use of Additive Manufacturing", **Leonardo DRS**, $15,000

HONORS, ACTIVITIES, AND SERVICE

Awards

- Best of Design Engineering Education Division (from >120 submission) for "A Mixed Methods Analysis of Motivation Factors in Senior Capstone Design Courses" at 2019 ASEE Annual Conference & Exposition
- Recipient of 2019 ASEE DEED Graduate Design Essay Competition for "Addressing the Possibilities: The Benefits of Implementing Artificial Intelligence in Engineering Design Education," Tampa, FL
- Recipient of 2018 ASME IDETC/CIE CAPP Graduate Research Poster Award for "Examining the Effect of Student Motivation on Academic Performance in Design Courses," Quebec City, Quebec, Canada
- Recipient of 2017 NSF Graduate Design Essay Competition for "Next Generation Robotic Applications for Design and Manufacturing," ASME International Design Engineering Technical Conference. Cleveland, OH
- **NSF Graduate Research Fellowship Program Honorable Mention**, 2016
- Recipient of 2016 NSF Graduate Design Essay Competition for "Internet of Things in Manufacturing," ASME International Design Engineering Technical Conference. Charlotte, NC
- Recipient of 2015 ASME Graduate Student of the Year Award recipient at Florida Institute of Technology
- Pi Tau Sigma Mechanical Engineering Honor Society inductee at Florida Institute of Technology
- Tau Beta Pi Engineering Honor Society inductee at Florida Institute of Technology

Publications Reviewed

Conference Proceedings

- International Design Engineering Technical Conference
- International Conference on Engineering Design
- American Society for Engineering Education

Journal Submissions

- ASME Journal of Mechanical Design
- ASME Journal of Medical Devices

Memberships

- Member, American Society of Mechanical Engineers, ASME — 2011 – Present
- Member, Society for Women Engineers, SWE — 2011 – Present
- Member, Order of the Engineer — 2013 – Present
- Member, American Society for Engineering Education, ASEE — 2016 – Present
- Member, Astrobiology Research and Education Society, ARES — 2016 – Present
- Member, Society of Automotive Engineers, SAE — 2019 – Present

Community Activities

- Volunteer/Mentor, FIRST Robotics — 2010 – Present

FELLOWSHIPS AND AWARDS

- ASEE Travel Award **$500** July 2019
- ASME CIE Travel Award **$750** August 2018
- NSF/ASME Travel Award **$1,250** August 2017

- NSF/ASME Travel Award **$1,250** August 2016

SKILLS AND QUALIFICATIONS

Computer

- Solidworks
- AutoDesk Inventor
- Creo/ProE
- R/RStudio
- C++
- ANSYS APDL
- ANSYS Workbench
- AMESim
- MATLAB
- Microsoft Office

Engineering

- Technical drawing
- Geometric dimensioning & tolerancing (GD&T)
- Analysis
- Composite design
- Graphical synthesis
- Rapid prototyping
- Statistical data analysis

Mechanical

- Machine shop
- CNC machines
- Composite work

Appendix D. Common Pre-requisite Form

Note: Included on ACC Agenda for Feb 2023 as a technical change.

RE: for ACC

NL Nelson, Lynn <Lynn.Nelson@flbog.edu>
To Tom Dvorske
Cc Nelson, Lynn

Reply | Reply All | Forward | ...

Thu 2/2/2023 3:25 PM

You replied to this message on 2/2/2023 3:49 PM.

Hi Tom,

I met today on this, and it was agreed that these are technical changes. These have been added to the agenda for the February ACC meeting.

Thank you!

Lynn

From: Tom Dvorske <tdvorske@floridapoly.edu>
Sent: Tuesday, January 31, 2023 2:28 PM
To: Nelson, Lynn <Lynn.Nelson@flbog.edu>
Subject: for ACC

Hi Lynn—

I just got off the ACC Oversight Committee and it got me to thinking about our own requests to ACC. Back in October, I send a request to Lynda to add Civil Engineering to the agenda for Poly. Lynda indicated – and confirmed—she sent it to Michael Stowell to include on the agenda.

So, two things:

1. I meant to, but did not, include Industrial Engineering as well; form attached.
2. I am similarly submitting Industrial Engineering (simply an oversight—I thought I send it in October as well).

Both are TECHNICAL CHANGES only. Please let me know if there are issues. I would like them to be included on the February 22 Agenda.

Best to you,
Tom

Tom Dvorske, Ph.D. (He/Him/His)
Vice Provost of Academic Affairs
SACSCOC Liaison
Florida Polytechnic University
4700 Research Way
Lakeland, FL 33805-8531
Ph. 863.874.8544 | C. 337.263.6118
https://floridapoly.edu/

STATE UNIVERSITY SYSTEM OF FLORIDA

Common Prerequisite Request

Institution:	**Florida Polytechnic University**
Institution Liaison:	Tom Dvorske, Vice Provost of Academic Affairs
Date of Submission:	01.31.2023
Program/Degree Type:	**Bachelor of Science in Industrial Engineering**
Program CIP Code:	14.3501
Program Credit Hours:	120

If applicable, please complete the following if you are notifying us of a change to:

Program Credit Hours:	Current Credit Hours: Click or tap here to enter text. New Credit Hours: Click or tap here to enter text. Effective Date: Click or tap here to enter text.
Limited Access Program Status:	☐ Change from open access to limited access ☐ Change from limited access to open access Effective Date: Click or tap here to enter text.
Program CIP Code:	Current CIP code: Click or tap here to enter text. New CIP Code: Click or tap here to enter text. Effective Date: Click or tap here to enter text.
Baccalaureate Program Status:	☐ Notification of a Program Termination - Term/Year Program Should be Removed from the CPM: Click or tap here to enter text. ☒ Notification of New Program - Anticipated Program Implementation Date: **Fall 2023**

Proposed Revisions(s) to the CPM (check all that apply)

The CIP Code Is Currently in the CPM:

☐ 1. Make curriculum changes to an existing track at proposing institution

☒ 2. Add program to a current track without curriculum changes

☐ 3. Add program to a current track with curriculum changes

☐ 4. Establish a new track without prerequisites

☐ 5. Establish a new track with prerequisites

6. For numbers 1-5, please provide track information below:
   a. ☐ Track 1 ☐ Track 2 ☐ Track 3 ☐ Track 4 ☐ Track 5 ☐ Track 6
   b. Track Name: Click or tap here to enter text.
   c. If this is a request to establish a new track, please provide justification as to why a new track is needed: Click or tap here to enter text.

The CIP Code Is Not Currently in the CPM:

☐ 7. Add program to the CPM without prerequisites

☐ 8. Add program to the CPM with prerequisites

Proposed Curriculum Changes:

☐ Add course(s) and/or course alternative(s)

☐ Eliminate course(s) and/or course alternative(s) (delete course from the CPM)

☐ Exempt course(s) and/or course alternative(s) (request exception from course)

☐ Carry over prerequisites from previous CIP without changes

☐ Carry over prerequisites from previous CIP with changes

☒ Other – please specify No changes; only adding a program

Please include the following supporting documentation with this proposal.

- The program page from the Common Prerequisite Manual, if applicable.

See next page 3.

- The program requirements for the baccalaureate degree program at your institution.

See page 4. The table illustrates the structure of all Florida Poly baccalaureate programs and explains each category.

Program:	Industrial/Manufacturing Engineering
CIP:	14.3501
Track:	1
Offered At:	FAMU, FSU, UCF, USF
Program Length:	128 Cr. Hrs.

REVISED 2/25/09
Revised course 10/23/2013
Technical 12/12/2018

LOWER LEVEL COURSES

	Course	Cr. Hrs.
	MACX311	4
or	MACX281	4
&	MACX312	4
or	MACX282	4
&	MACX313	4
or	MACX283	4
&	MAPX302	3
or	MAPX305	3
&	CHMX045/X045L	4
or	CHMX045C	4
or	CHSX440/X440L	
&	PHYX048/X048L	4
or	PHYX048C	4
&	PHYX049/X049L	4
or	PHYX049C	4
or	PHYX044	
&	PHYX049L	

FOR ALL MAJORS: Students are strongly encouraged to select required lower division electives that will enhance their general education coursework and that will support their intended baccalaureate degree program. Students should consult with an academic advisor in their major degree area.

STATE UNIVERSITY SYSTEM OF FLORIDA

University Undergraduate Program Curriculum Template -- Category View

Category	Course	Credits	Code
I. Learning Foundations		**38**	
	Professional Foundations and Critical Communication	8	
	ENC 1101 - English Composition 1: Exp and Arg Writing (W)	3	GESR
	ENC 2210 - Technical Writing (W)	3	GESR
	EGN 1006 - Career Design for STEM Professionals	1	
	EGN 1007C - Concepts and Methods for Engineering and Computer Science	1	
	IDS 4941 - Professional Experience Internship	0	
	STEM Core	22	
	IDS 1380 - Foundational Lessons and Applications in Mathematics	3	
	COP 2271 - Introduction to Computation and Programming	3	
	MAC 2311 - Analytic Geometry and Calculus 1	4	
	MAC 2312 - Analytic Geometry and Calculus 2	4	
	CHM 2045 - Chemistry 1	3	
	CHM 2045L - Chemistry 1 Laboratory	1	
	PHY 2048 - Physics 1	3	
	PHY 2048L - Physics 1 Laboratory	1	
	Cultural and Social Awareness	12	
	ARH 2000 - Art Appreciation	3	GESRO
	PHI 2010 - Introduction to Philosophy	3	GESRO
	HUM 2020 - Introduction to the Humanities	3	GESRO
	MUL 2010 - Music Appreciation	3	GESRO
	LIT 2000 - Introduction to Literature	3	GESRO
	HUM 2022 Explorations in the Humanities (Various Topics)	3	GEO
	IDS 2144 Legal, Ethical, and Management Issues in Technology	3	GEO
	AMH 2010 - American History to 1877	3	GESRO
	AMH 2020 - American History Since 1877	3	**GESR**
	~~AMH 2930 - History: Special Topics~~	~~3~~	~~GEO~~
	ECO 2013 - Principles of Macroeconomics	3	GESRO
	ECO 2023 - Principles of Microeconomics	3	GESRO
	PSY 2012 - General Psychology	3	GESRO
II. Advanced Math and Science (some may be included in program core)		**15**	

&/OR	BSC 1010 - Biology 1	3	
	BSC 1010L - Biology 1 Laboratory (W)	1	
	EVR 1001 - Environmental Science	3	
	EVR 1001L - Environmental Science Lab	1	
	MAC 2313 - Analytic Geometry and Calculus 3	4	
	MAD 2104 - Discrete Mathematics	3	
	MAP 2302 - Differential Equations	3	
	PHY 2049 - Physics 2	3	
	PHY 2049L - Physics 2 Laboratory	1	
	STA 2023 - Statistics 1	3	
	STA 3032 - Probability and Statistics	3	
	MAS 3105 - Linear Algebra	3	
	MAS 3114 - Computational Linear Algebra	3	
III. Program Core		**≤55**	
REQ	XXX-4XXX Senior Capstone 1	3	
REQ	XXX-4XXX Senior Capstone 2	3	
IV. Concentration		**≡ 12**	
V. Electives		**0+**	
		120	

I. Learning Foundations -- Description

The courses in this category comprise the general education program. The State of Florida and institutional accreditors required 36 hours in GE, across broad disciplinary areas including communication, math, science, humanities, social sciences. Florida Poly include an additional two credits associated with professional foundations as part of the core learning foundations for all students. **These lists are largely prescriptive.**

Florida Poly's Learning Foundations core includes three sub-categories that address both broad educational essentials and institutional values such as critical thinking, team work in professional contexts, effective communication, and fundamental knowledge, skills, and behaviors in mathematics and science essential to STEM students' learning.

Professional Foundations and Critical Communication course support students' educational and career objectives and provide foundation for thoughtful and effective communication essential to career success and civic engagement.

STEM Core is the critical pathway to success for Florida Poly students. All courses must be passed with C or better and any grade lower than C results in required retake of that course in the subsequent semester. In some cases, a program my not required MAC 2312 to be taken.

Cultural and Social Awareness courses advance the objectives of a broad, liberal education for all students and provide foundation for students to make informed judgments that consider the impact of science, technology, and engineering solutions in global, economic, environmental, and social contexts.

CODE

GESR - General Education, State Required Course

GESRO - General Education, State Required Option - any GESRO course may be used to fulfil State of Florida gen ed options for this category.

GEO - General Education Option - so long as one GESR and one GESRO is met in each box, then any GEO may be taken to round out the Cultural and Social Awareness Category.

II. Advanced Math and Science -- Description

A Florida Poly students' foundational education continues to build with additional study in advanced mathematics and sciences to ensure that engineering and applied solutions are grounded in strong mathematical and scientific principles and methods.

Each program draws approximately 15 credits from this list. Some courses here may be included elsewhere, such as in program core, depending on the program's discipline and focus.

This list is not prescriptive, but descriptive of the different ways programs fulfill the advanced math/science category.

III. Program Core -- Description

Program core vary by discipline and degree program. All program core include multiple channels that round out disciplinary theory, application, and professional experience. For example, a typical construct includes a "core" of engineering sciences that parallel a design sequence. Another example is a program core that includes a programming channel, which may parallel a database/data analysis channel.

All programs culminate in a two-semester capstone design sequence where students collaborate on interdisciplinary teams in an effort to provide a solution to an industry-sponsored problem.

IV. Concentration(s) -- Description

Many programs include "concentrations." A 12-credit grouping of courses that augment the essential core curriculum of the degree program. Concentrations provide students with exposure to a subfield within the discipline and are intended to enhance the breadth of knowledge obtained within the degree. Concentrations are typically junior and senior year classes.

V. Electives -- Descriptions

Providing room is available in the curriculum, a program may include a slot or two for 3 - 6 credits (occasionally more) of elective credit. Elective courses should do for the program in a single course, what a concentration does over 4 courses: provides an exposure to a subfield/application/theory or other that adds depth and or breadth to the student's educational experience.

Total Credits.

All Florida Poly baccalaureate degree programs consist of 120 credit hours only. This is consistent with the standards for baccalaureate degrees and supports the State of Florida's emphasis on completion in four-years and reduced overall cost to students.

STATE UNIVERSITY
SYSTEM OF FLORIDA

If this request is for any of the following, do not complete anything further:

- Add program to a current track without curriculum changes
- Establish a new track without prerequisites
- Add program to the CPM without prerequisites

If this request is for any of the following, please complete 1-7, where applicable:

- Make curriculum changes to an existing track at proposing institution
- Carry over prerequisites from previous CIP with no changes
- Carry over prerequisites from previous CIP with changes
- Add program to a current track with curriculum changes
- Establish a new track with prerequisites
- Add program to the CPM with prerequisites

1. For required prerequisite course(s) and/or course alternative(s), please list the following information for each course (add rows if necessary).

Course Prefix and Number	Course Title	Course Alternative	Justification for Course(s)	Credits
Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.	
Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.	
Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.	
Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.	
Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.	
			Total Credits	

2. If the course(s) above includes a course(s) that is offered currently at three or fewer FCS or SUS institutions, please provide justification as to why the course is critical for a student's success in the baccalaureate degree program. Please visit the Statewide Course Numbering System to determine the number of institutions that offer the course(s) (add rows if necessary). Click here for instructions on how to navigate the SCNS.

Course(s) limited to 3 or less FCS/SUS institutions	Number of FCS Institutions Currently Offering Course (out of 28)	Number of SUS Institutions Currently Offering Course (out of 12)	Justification for Course(s)
Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.
Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.
Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.

3. If the request includes courses that are offered only at your institution, explain what options are available to students at other institutions for completing the required courses (add rows if necessary).

Course(s) Only at Proposing Institution	Option(s) at Other Institutions	Explanation of Option(s)
Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.
Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.
Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.

4. If the request includes exemption from or elimination of a prerequisite course(s) and/or course alternative(s), please list the following information for each course that you would like to be exempt from or eliminate (add rows if necessary).

Course Prefix and Number	Course Title	Justification for Course Elimination/Exemption
Click or tap here to enter text.	Click or tap here to enter text.	☐ Exempt from Course ☐ Elimination of Course Click or tap here to enter text.
Click or tap here to enter text.	Click or tap here to enter text.	☐ Exempt from Course ☐ Elimination of Course Click or tap here to enter text.
Click or tap here to enter text.	Click or tap here to enter text.	☐ Exempt from Course ☐ Elimination of Course Click or tap here to enter text.

5. Please provide the college level prerequisite(s) for the common prerequisite course(s) if applicable (add rows if necessary).

Course Prefix	College Level Prerequisites	Credits
Click or tap here	Click or tap here to enter text.	
Click or tap here	Click or tap here to enter text.	
	Total Credits	

6. Please provide the information requested below for the review of common prerequisite completion within 60 credit hours.

Number of credit hours for AA	60
Subtract number of credit hours required for common prerequisites	-
Subtract number of college level course prerequisites for common prerequisite courses (if known)	-
Add the number of credit hours for common prerequisites that are also general education core requirements	+
Total number of credit hours left to complete the rest of the student's general education requirements	=

7. If a student does not have enough room in the "total" above to complete the rest of the general education requirements, please provide justification for requiring more common prerequisite course credit hours than can be accommodated by the student in 60 credit hours.

Click or tap here to enter text.

AGENDA ITEM: VI.C.

Florida Polytechnic University

Academic and Student Affairs Committee

Board of Trustees

February 8, 2023

Subject: Graduate Student Tuition Waiver

Proposed Committee Action

At the November 2021 Board of Trustees meeting, the board approved a $150 per credit hour waiver for graduate tuition. This waiver was authorized for students that entered the university in the 2022-23 academic year and produces a competitive price position for our graduate degree compared to neighboring institutions. The price positioning is necessary to facilitate growth in the self-funded graduate student market.

This request is to extend this waiver for the coming three years. The formal resolution is:

Recommend to the Board of Trustees approval of an automatic tuition waiver of $150 per credit hour for all graduate students who are starting graduate school at the university in AY 2023-24, AY 2024-25, AY 2025-26. This waiver, defined as the "BOT Graduate Tuition Waiver" is distinct from our general tuition waiver and our out-of-state tuition waiver.

Background Information

Performance Based Funding as currently configured includes Metric 8 which is "Graduate Degrees awarded in Areas of Strategic Emphasis." This metric is an area of strength for the campus since all of our degrees are in Strategic Emphasis Areas. As a requirement to use this metric, and not the alternative metric ("Freshman in Top 10% of Graduating High School Class"), Florida Poly was required to produce more than 25 Master of Science graduate in one academic year. We met this goal last year and now must maintain (and grow) graduate student production.

To facilitate growth, we have considered and put in place different tracks and funding models for our graduate degrees. These tracks and funding models are:

- Thesis based M.S. degrees. These degrees are intended to require 21 months to complete and require independent research that culminates in a thesis. Support for these degrees is typically either from a research grant (external funding source) or from the institution (internally funded, typically some level of supporting work is required from the student). Due to the youth of the institution and its faculty, nearly all thesis based funding support comes from institutional funds.

  These degrees are limited by the internal budget and/or external research funding available for direct support of students (typical awards include all tuition and fees in addition to a modest living stipend). At this time, this is not sufficient funding to support an appropriate volume of students.

- Non-thesis based degrees. These are course-work only M.S. degrees and we have produced degree "tracks" that are 11 months in duration. This program is targeted at the self-funded student and is highly cost effective because of the cost structure of the degree (noting the $150.00 per credit hour tuition waiver), and the accelerated nature of the degree program. For self-funded students, much of the cost for the degree is NOT tuition and fees, but rather is the living costs while a student is in school. Moving an M.S. degree from 21 months to 11 months is a very real cost saving to the student.

- Since we have implemented these changes we have moved from 100% of our students that are admitted to the graduate program being recipients of full tuition, fee, and stipend aid in fall 2020 to 25% of our students being fully supported students in the fall of 2022.

The following table and figure provide important context for this request.

GRADUATE STUDENT FEE SCHEDULE	RESIDENT	RESIDENT with tuition waiver
Tuition	$385.00	$385.00
BOT Graduation Tuition Waiver	0	-$150.00
Out-Of-State Fee	$0.00	$0.00
Financial Aid Fee	$19.25	$19.25
Non-Resident Financial Aid Fee	$0.00	$30.40
Capital Improvement Trust Fund Fee	$4.76	$4.76
Transportation Fee	$3.00	$3.00
Activity and Service Fee	$17.62	$17.62
Athletic Fee	$14.12	$14.12
Health Fee	$9.58	$9.58
Technology Fee	$19.25	
Total	$472.58	$333.73

Table 1. Graduate tuition and fee schedule for Florida resident students

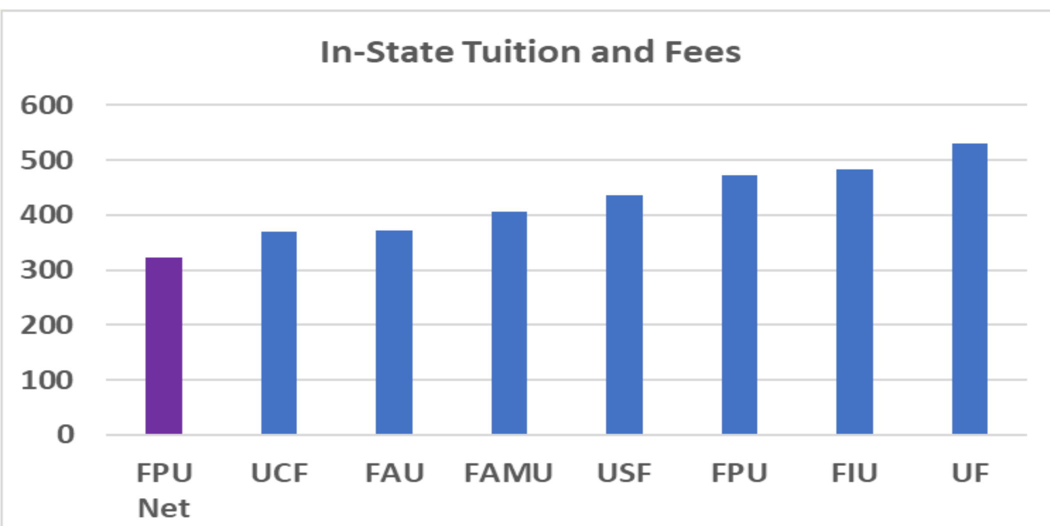

Figure 1. Bar chart that shows per credit hour resident tuition and fees for several universities in the state system. The purple bar on the left shows the net per credit hour cost after the

tuition waiver. The bar that is the third from the right shows the Florida Poly tuition without the waiver.

Supporting Documentation: N/A

Prepared by: Dr. Terry Parker, EVP and Provost

AGENDA ITEM: VI.D.

Florida Polytechnic University

Board of Trustees

Academic & Student Affairs Committee

February 8, 2023

Subject: **Student Success Plan Review and Report Approval**

Proposed Committee Action

Recommend approval to the Board of Trustees of the final report for the Student Success Plan.

Background Information

This final report provides an abbreviated motivation for the Student Success Plan followed by abbreviated task descriptions from the plan that was approved by the Board of Governors at their September 2022 meeting. Each task is followed by a status statement on the task. These descriptions are clearly marked in shaded boxes below each task description.

Supporting Documentation: Final Report for the Student Success Plan

Prepared by:
Dr. Terry Parker, EVP & Provost
Dr. Tom Dvorske, Vice Provost Academic Affairs
Dr. Kathryn Miller, Vice Provost Student Affairs
Dr. Ben Matthew Corpus, Vice Provost Enrollment Management
Andrew Konapelsky, University Registrar
Dr. Mary Vollaro, Chair, Mechanical Engineering

Student Success Plan: Final Report
Florida Polytechnic University
February 2023

I. Executive Summary

This Student Success Plan is focused on advancement in areas guided by Performance-Based Funding (PBF) metrics where the University has underperformed. Florida Polytechnic University has developed six strategies that will strengthen the execution of our mission and advance performance on seven key performance metrics. Positioning Florida Poly to sustainably receive a score of at least 70 or more excellence points within the PBF system is central to this plan. The University has aggressively pursued the tasks defined in the original plan, and has completed, or will complete in the coming weeks, the plan.

This final report provides an abbreviated motivation for the Student Success Plan followed by abbreviated task descriptions from the plan that was approved by the Board of Governors at their September 2022 meeting. Each task is followed by a status statement on the task. These descriptions are clearly marked in shaded boxes below each task description.

II. University Mission and Background for Performance-Based Funding

The table below shows results from our two years in the PBF system (2021 and 2022) for the metrics addressed in this plan. The precipitous drop in score from 2021 to 2022 is driven by performance in the first year where improvement points provided 33 of the 83 points received. For year 2022, our performance was similar to the prior year (or, in the case of Academic Progression Rate [APR], impacted by COVID) thus shifting the campus to "excellence points" which were not sufficient to achieve a score above 70. **This plan positions Florida Poly for sustained achievement, based on excellence points, to be above 70 points; Florida Poly will use this Student Success Plan to drive excellence scores upward in critical metrics, in support of the University mission.**

		Scores based on Excellence or Improvement					
PERFORMANCE-BASED FUNDING METRIC		POINTS	2021 Score	SCORE	2022 Score	SCORE	Variance from 2021 to 2022
1	% of B.S. Grads Employed ($30K) or Cont. their Ed.	EXCELLENCE	74.1%	10	69.6%	9 (norm)	-1
		IMPROVEMENT		10		0	
4	Four-Year Graduation Rate *Full-Time FTIC Only*	EXCELLENCE	34.3%	0	38.2%	1	
		IMPROVEMENT		0		7	7
5	Academic Progress Rate (APR)	EXCELLENCE	76.6%	0	64.2%	0	
		IMPROVEMENT		10		0	-10
7	University Access Rate *Percent of UG w/ Pell*	EXCELLENCE	33.8%	7	33.1%	7	-1
		IMPROVEMENT		8		0	
8.A.	Percent of Freshmen in Top 10% of H. S. Class	EXCELLENCE	32.0%	2	33.0%	3	-7
		IMPROVEMENT		10		2	
9.A.	2-Year Graduation Rate AA Transfer	EXCELLENCE	4.2%	0	4.0%	0	0
		IMPROVEMENT		0		0	
9.B.1	2nd Year Retention for FTIC with a Pell-Grant	EXCELLENCE	87.8%	3	66.0%	0	
		IMPROVEMENT		5		0	-5
		Total		83		66	-17

Table 1. Performance based metrics that are the focus of this student success plan. The total shown at the bottom is the sum for all metrics.

Academic Progression Rate (APR, for the First Time In College [FTIC]) cohort and for Pell students, metrics 5 and 9.B), FTIC four-year graduation rates (metric 4), and three-year graduation rates for Associate of Arts (AA) Transfer students (metric 9.A[1]) are naturally difficult metrics for all our STEM peer institutions. In addition to promoting student success that aligns with the metrics listed above, Florida Poly will strengthen its support of graduate programs where the university has transitioned from metric 8.A (fraction of incoming FTIC students in top 10% of their high school class) to Metric 8 (Fraction of graduate degrees in areas of strategic emphasis).[2] The plan described below focuses on improvement in the metrics listed in Table 1. **Based on the long time scales associated with academic progression and graduation rates we started student success activity in support of PBF improvement in summer 2021. The Student Success Plan formalizes and extends this important activity.**

III. The Student Success Plan

This Student Success Plan is designed to achieve a score of 70 or more excellence points by summer 2024 (noting that we expect our score to be above 70 in 2023 with the inclusion of improvement points). The Student Success Plan is based on six strategies that create systemic change on our campus in support of improved student success., The strategies are:

A. **Excellence and Achievement in the Freshman Year (PBF #4, PBF #5, PBF #9.B)**
B. **Student Culture: Supporting the Whole Student (PBF #1, PBF #4, PBF #5)**
C. **Graduate On Time (PBF #4, PBF #9.A)**
D. **Grow and Support the Graduate Program (PBF #8)**
E. **Provide Tailored Support for Pell Students (PBF #7, PBF #9.B)**
F. **Promote Strong Employment Outcomes for Our Students (PBF #1)**

These six strategies are briefly presented below with rationale for each strategy and an overview of critical elements required to execute the plan.

A. Excellence and Achievement in the Freshman Year (PBF #4, PBF #5, PBF #9.B)

Student progression and on-time graduation are critical areas where the University struggles; the most important issue is low retention from the freshman to sophomore year (as measured by APR) of students. An analysis of FTIC students who do not return in their sophomore year shows poor academic performance as the root cause. Rationale for poor performance includes the rigors of an all-STEM curriculum (noting the nationwide failure rate for calculus 1 is over 30% and that other core freshman STEM courses have similar failure rates) and the destructive effect of COVID on both student academic preparation and overall maturity. Our analysis shows that Florida Poly's fall 2020 cohort of FTIC students had an APR of 64%; our projection for fall 2021 FTIC students is significantly better with a 76% APR. This gain in APR is based in part on the Freshman Initiative, which we launched in fall 2021. We expanded this Freshman Initiative into "Excellence and Achievement in the Freshman Year," which is a part of this Student Success Plan with the elements listed below.

i. ***Freshman Council***: The Freshman Council provides organizational consistency for critical freshman courses and produces coordination across the multiple departments that deliver first-year courses. This Council will impact the entire first-year experience and culture with coordination and

[1] Note that this metric is transitioning from a two-year rate to a three-year rate starting in summer 2023.
[2] Metric 8 is used for ten other universities in the SUS.

collaboration across the STEM core curriculum. The council, acting as the managing department for a key set of courses, is empowered to manage:

- **Policies:** Common grade scale; similar percentages assigned to homework and exams; attendance policies; student-friendly exam schedule.
- **Effective and efficient learning initiatives:** Explicit use of course learning objectives in driving curriculum; focus on process, communication, and critical thinking; focus on the use of out-of-class student time-commitment and learning resources with to learn; emphasis on active learning in highly engaged classrooms.
- **Student support:** Frequent feedback to students through formative assessment; strong academic support network through Peer Learning Strategists (PLS) and a centralized help center.
- **Broad feedback on overall success:** Progress metered via a STEM core GPA and course-completion count.

Progress on this task: *This activity has been accomplished.*
The Freshman council was established at the start of the fall 2022 semester; it has provided the framework to maintain and demand common policies in freshman courses, supports a focus on high quality teaching, has been a critical player in managing the Peer Learning Strategists program, and regularly considers, and advocates for the academic needs of the freshman. The STEM core GPA and completion ratio within a student's freshman year will be used as a predictive tool to measure a student's academic progress and their potential to graduate on time.

ii. ***Creation of the STEM Core***: The STEM Core curriculum consists of 22 credits: two courses from the Calculus sequence, Physics 1 and Chemistry 1 with labs, an introduction to computer programming course, and an introductory course in STEM applications. FTIC students who matriculate through these courses over the fall, spring, and summer (if needed) of their freshman year are well positioned to confidently enter their selected degree programs as sophomores on track to graduate in four years.

Progress on this task: *This activity has been accomplished.*
The STEM Core has been established, integrated into our advising best practices and used actively in the monitoring of student academic progression. Students are required to complete the STEM core as early in their degree program as is practical. The University has implemented progression policies are rigorously applied to students and strong interventions are applied when students are not progressing through the STEM Core.

iii. ***Enhancing the Freshman Year with Hands-On, Team-Based Projects:*** To address issues around poor student engagement, we identified key curricular opportunities to reconfigure course experiences and include team-based projects which encourage student engagement. Specifically, hands-on and team-based activities have been added to two key first year courses.

Progress on this task: *<u>This activity has been accomplished.</u>*
These first-year team-based projects position students to advance through the design and/or project sequences specific to their program of study. We delivered an entry course to ~450 entering students initially in fall 2021 and repeated in fall 2022 (EGN 1006 Career Design for STEM Disciplines). The course includes a team-based, multi-hour project as the culminating activity. We are including a similar (but slightly more complicated) project in EGN 1007 Concepts and Methods for Engineering and Computer Science (approximately 350 students) in spring of 2023. The team-based project in each course provides a faculty-led opportunity to engage with the curriculum as a part of a team.

iv. ***Policy Enhancements:*** We have changed our policy execution to require students to progress toward their declared degree, augmenting the already in place traditional GPA-based probation and suspension controls. This more tightly controlled student progression has resulted in some student suspensions, but it allows us to focus resources on students who are making academic progress.

Progress on this task: *<u>This activity has been accomplished.</u>*
We continue to use a combination of policies: grade forgiveness policies that provide a pathway for success by helping students recover from first-term course failures; and academic progression policies that require students to repeat courses they have failed or withdrawn from that prove critical to successful academic progression.

v. ***Student Support Services***: As a part of Student Support Services, we have restructured tutoring and academic support on the campus starting in fall 2021. This restructuring was driven by aligning departments and faculty for the key foundational courses with peer tutors/Peer Learning Strategists (PLS) familiar with the subject matter and trained in learning techniques. This activity, coupled with a designated place on campus for PLS, has been well received by students and faculty. In addition, we are rebuilding our advising unit, starting with the position creation and hiring of an Associate Vice Provost of Student Success with direct reporting line to the Provost. Three new dedicated success coaches will also be hired (bringing the total to four). Strongly included in the mission of this success center is the "emotional and information support" that is necessary; students need a place to have their questions answered and a place to go with complicated, non-academic questions.

Progress on this task: *<u>This activity is underway and will be completed in the coming weeks.</u>*
We have continued with an external consultant to help refine the learning services delivered by student Peer Learning Strategists (PLS). This system continues to support first-year courses and we have expanded the courses that we support in the Tutoring and Learning Center (TLC). The AVPSS has been assigned oversight of the day-to-day operations of the TLC and will provide non-academic training of the PLS. Academic training for the PLS will continue to be provided by subject matter experts from the various academic units. This portion of the task is complete.

We committed to hire an Associate Vice Provost of Student Success (AVPSS) and three success coaches. To date we have hired the AVPSS and one of the three success coaches. We are finalizing the hiring process for the final two success coaches in the coming weeks to complete this task.

vi. ***Freshman Course Assignment and Registration Requirement***: At Florida Poly, we enroll all new students in their first semester of courses to ensure they begin on an appropriate path that will lead to optimal degree progression. As an enhancement to this initiative, starting with the 2021 FTIC cohort, we analyzed prior student admissions data and course performance data to develop schedule-based cohorts for students with varying levels of rigor. Using this data, students were registered for schedules where they are more likely to be successful. For the entering 2022 FTIC cohort, we have refined this practice with a strong focus on mathematics placement with a data-driven, multi-step process to account for our students' varying mathematical backgrounds.

In addition to the care taken in assigning freshman year courses, we have also changed our practice to require all students to see a faculty advisor before they register for courses in the sophomore year (and beyond), and we have additionally put in place registration hold-based intervention mechanisms to require students to take key courses that are necessary for them to maintain academic progress and graduate on time.

Progress on this task: *This activity has been accomplished.*
As we created student schedules in the fall, we followed the process noted above. In our advising for students, we have proactively noted the importance of completing the STEM core in their freshman year and the utility of the summer to retake STEM core courses. We continue to require students to meet with an advisor in order to register for classes.

B. Student Culture: Supporting the Whole Student (PBF #1, PBF #4, PBF #5)

Florida Poly strives to support the whole student and hone not only their academic talent, but their professional skills with guidance, engagement, and a wide range of opportunities to match the unique individuals in our student body. Leadership is a critical part of the whole student experience, as well as career development. Employers expect students to navigate the workplace seamlessly, knowing when to lead and when and how to contribute. An active and complete program in leadership supports retention, on-time graduation, and positive employment outcomes.

As a part of this Student Success Plan, we will hire a new Director of Career Services, and also a program coordinator who will organize the full suite of leadership activities at the University. These individuals will work with a department chair who has over a decade of experience with leadership programs on another campus.

The ULead program was established in fall of 2021 and has provided training and experience for students through activities sponsored by Students Affairs. Expansion of leadership opportunities includes an Emerging Leaders Program, focused on inviting students "in" to participate in activity outside the required curriculum. The curricular piece of this program reaches out to all students by mapping experiential learning activities with a leadership component throughout the curriculum

Progress on this task: *This activity is underway and will be completed in the coming weeks.*
We established the ULEAD program in the 2021-22 and have continued this year to grow the program. In addition, we have started the Emerging Leaders Program with a defined structure and planned events that will launch in the upcoming weeks. In addition, we are working with all degree programs to carefully configure their curriculum to include a course per semester that includes increasingly challenging team-based, open-ended problems as a part of the class. *This portion of the task is complete*.
As a part of this task, we were to hire a new Director of Career Services and a program coordinator to support career services. We have hired the Director of Career Services and expect to complete the hiring process for a leadership coordinator in the coming weeks.

C. Graduate on Time (PBF #4, PBF #9A)

Providing students with a comprehensive and timely advising experience is essential to ensure they efficiently complete the necessary coursework to graduate on time. To facilitate this integrated, holistic, and individualized advising support, Florida Poly will implement a comprehensive advising system which will become the key advising resource and tool. Facilitating progression in this strategically supported manner will lead to improvements in retention and degree completion for all populations of students, which will directly impact PBF #4 and PBF #9.A, as well as PBF #5 and PBF #9.B.

The improved academic advising system will provide key infrastructure needed to support the significant improvements to student advising that Florida Poly began to implement in fall 2021. The creation of start-to-finish degree plans for FTIC students and AA transfers, during the first term, will provide students with a full pathway to on-schedule degree completion.

Progress on this task: *This activity is underway and will be complete in the coming weeks.*
This task includes implementation of a comprehensive advising system that provides "start to finish" advising for students and degree progress tracking. The system (product name is Stellic) has been integrated with our Student Information System and will be released for use on or before March 1, 2023. In addition, we have created (consistent with the guidance for this task) start-to-finish progress plans for first-year Florida College System (FCS) AA transfer students.

D. Grow and Support the Graduate Program (PBF #8)

Metric 8.A (percentage of incoming class that is the top 10% of their high school class) is applied to Florida Poly and one other member of the SUS due to the small size of the graduate program. Florida Poly moving forward will use Metric 8.
To continue to support the graduate program in terms of growth and management, we will hire a graduate program coordinator this year.

Progress on this task: *This activity has been accomplished.*
This task called for the hiring of a Graduate Coordinator. This person has been hired, and in addition, as we move to growing the graduate program, the reporting for the Graduate Coordinator has been moved to the provost in anticipation of the formation of a formal Graduate Office.

E. Provide Appropriate Support for Pell Students (PBF #7, PBF #9.B)

About one-third of Florida Poly students are Pell eligible, however, up to half have household incomes under $40,000 a year. Roughly 35% of our students are also the first in their families to attend college.

Many of these students attended under-resourced high schools with little academic support, no AP courses, low graduation rates, and high student-counselor ratios.

All of the opportunities for the overall student body are available to our Pell students. In addition, low-income and first-generation students will be provided a comprehensive set of academic support services that include, but are not limited to:

- Intrusive academic advisement, as necessary or required
- Identify and provide additional training for a success coach specializing in Pell
- Campus work-study programming with mentors
- Campus programming and financial aid counseling
- Additional funding opportunities for textbooks and academic materials

Progress on this task: *This activity has been accomplished.*
This task asks for increased services for Pell and First-Generation students. We have established a Pell "working group" and begun tailoring key services for these students. In addition, we awarded an average aid package in the fall semester of $6340 to Pell students in support of their ongoing funding needs as they seek degrees. Additional aid in the fall of $600 per student was disbursed to approximately 350 students. Finally, there was significant other aid provided by additional need-based aid and the Florida Assistance Grant.

F. Promote Strong Employment Outcomes for Our Students (PBF #1)

To support strong employment outcomes for our students, a Director of Career and Leadership will be hired. We have elevated this position to include leadership programs based on a philanthropic gift that intends to couple a broad concept of leadership with programs across the University that promote skills and behaviors that make our students more employable. This gift allows us to recruit and pay for a seasoned professional in this unique area. A larger discussion of leadership is provided in section B (Student Culture: Supporting the Whole Student).

Progress on this task: *This activity has been accomplished.*
As noted before, we have hired the Director of Career Services who will work to develop "career growth plans" specific to each major. These career growth plans are grounded in discussions with industry with a focus on providing internship and career opportunities to our students.

IV. Student Success Plan Status

Florida Polytechnic University has embraced the importance of student academic and career success, and with this plan, has moved expeditiously to respond to difficulties with academic progression. This Student Success Plan was formally approved at the start of the Fall semester in 2022 and will improve University PBF performance to meet the required score of 70 based on excellence points by summer 2024. This Student Success Plan describes our strategies and tactics for continuing to build on the foundations we've already established through continuous improvement and incorporating additional key tactics, tools, and methods.

Florida Polytechnic University is pleased to report that we have accomplished nearly all tasks that were outlined in the six strategies of the student success plan, and notes that we expect all tasks to be fully complete before March 1, 2023.

AGENDA ITEM: VI.E.

Florida Polytechnic University

Academic & Student Affairs Committee

Board of Trustees

February 08, 2023

Subject: **Regional Accreditation Discussion**

Proposed Committee Action

Information only – no action required.

Background Information

On July 1, 2020, the Code of Federal Regulations eliminated the regional restrictions associated with accreditation of higher education institutions. The result of this change is that institutions are now free to pursue accreditation with a federally recognized institutional accreditor from outside of their region, provided the institution does so voluntarily.

Until July 1, 2022, all Florida institutions of higher education were by statute and/or regulation required to be accredited by the Southern Association of Colleges and Schools Commission on Colleges (the University's current institutional accreditor, SACSCOC). The change in Florida law brings the state in line with Federal Regulation in that colleges and universities may now voluntarily pursue institutional accreditation from an agency other than SACSCOC. Importantly, Florida state law ***requires*** that once an institution completes either its decennial (or equivalent) reaffirmation or fifth-year review, the institution ***must*** seek membership with another agency.

Florida Poly was reaffirmed by SACSCOC on December 6, 2022, for a ten-year period, thus triggering the institution, by law, to begin this process.

Changing institutional accreditation agencies begins with informing the University's Board of Trustees. Second, the university must submit a request for change in agency to the U.S. Department of Education. This request must be voluntary, demonstrate reasonable cause for the change, and explain how the change will strengthen the University and benefit the students. If the Department of Education approves the University seeking another agency, Florida Poly intends to begin the application and candidacy process with the Higher Learning Commission (HLC).

University accreditation liaisons in collaboration with Board of Governors' staff conducted a review of all institutional accreditors. This review included meetings between the BOG Chancellor and Vice Chancellor, accreditation liaisons from Florida Poly and UCF, and the Presidents and senior staff of each of the five eligible institutional accrediting agencies.

Throughout this research process, the Higher Learning Commission emerged as the best fit for Florida Poly. Factors contributing to this choice include:

- Capacity: HLC is the largest institutional accreditor with a staff and operations able to accommodate existing accredited institutions in a streamlined, accelerated process.
- Governance: HLC's exhibits a strong shared governance process where the agency actively engages member in policy and standards-making processes.

- Client-Focus: HLC displays a strong client-focused culture and has been highly responsive to interest from Florida institutions. HLC has set aside a special session at its Annual Meeting in March 2023 for Florida institutions seeking accreditation.
- Efficiency: HLC's decision-making processes occur approximately four-times per year, whereas SACSCOC makes decisions only twice per year. HLC also maintains a short timeline between routine requests for approval and final decisions, which facilitates institutional innovation and responsiveness to industry needs.

The relative time frame for officially changing agencies depends on several factors but tends to be approximately 18 – 36 months. Critical to the University throughout this process is that it maintain compliance with all applicable policies and principles of SACSCOC, while also making appropriate adjustments to ensure compliance with HLC standards.

This process should not disrupt the University's ability to award federal financial aid or participate in federal grants.

Supporting Documentation:

1. Florida Polytechnic University DRAFT letter to the U.S. Department of Education
2. Code of Federal Regulations 34 CFR 600.11. Special rules regarding institutional accreditation or pre-accreditation (up-to-date as of 1/13/2023)
3. US Department of Education Letter to Accrediting Agencies, July 19, 2022
4. Department of Education Federal Student Aid publications:
    a. Guidance for Institutions Seeking to Change or Add Accrediting Agencies (July 19, 2022; DCL ID: GEN-22-10)
    b. Procedures for Institutions Seeking Approval of a Request to Change or Add Accrediting Agencies. (Updated September 26, 2022; DCL ID: GEN-22-11)
5. Florida Board of Governors report on Accreditation
6. Florida Board of Governors report on Accreditation – Appendices on agencies
7. Higher Learning Commission – Accelerated Process for Initial Accreditation

Prepared by: Dr. Randy K. Avent, President; and Dr. Tom Dvorske, Vice Provost of Academic Affairs, Accreditation Liaison

FLORIDA POLYTECHNIC UNIVERSITY

February 17, 2023

RE: Request to seek a different institutional accrediting agency

Florida Polytechnic University formally requests approval from the United states Department of Education to pursue a change in institutional accreditor, per the Code of Federal Regulations (CFR) that became effective July 1, 2020.

Until 2022, Florida law and state regulation specified that all public institutions of higher education must be accredited by the Southern Association of Colleges and Schools Commission on Colleges (SACSCOC). Newly implemented Florida Statute 1008.46, along with other state regulatory changes, removes that language, allowing State colleges and universities the opportunity to pursue accreditation through another agency. The Florida Statue also requires that institutions must change accreditors upon next reaffirmation or fifth-year report; however, it does not dictate the agency.

Florida Poly's request to change accrediting agency to the Higher Learning commission (HLC) is the result of careful analysis of several characteristics of the potential agencies. Our investigation included meetings between the Chancellor and Vice Chancellor of the Florida Board of Governors, accreditation liaisons from Florida Poly and University of Central Florida, and the Presidents and senior staff of each of the five eligible institutional accrediting agencies. In addition to the results of these meetings, the University has examined accreditor mission and vision statements, standards and principles, policies, processes for achieving accreditation and subsequent reaffirmation cycles, governance models, operations infrastructure, and cost of membership. In the end, we feel confident that our proposed change will benefit Florida Polytechnic University students and the State of Florida.

a. **The name of the institution's current primary accrediting agency and the name of the institution's propose new agency;**
    - Florida Polytechnic University's current accrediting agency is the Southern Association of Colleges and Schools Commission on Colleges (SACSCOC)

b. **Whether the institution is seeking to change primary accrediting agencies or seeking multiple accreditation**;
    - Florida Poly's proposed new agency is the Higher Learning Commission (HLC)

c. **If the institution is seeking multiple accreditation, whether the institution plans to relinquish accreditation by its current primary accrediting agency and, if so, the timeframe for relinquishment;**
    - Not applicable to our institution.

d. **The date that the institution's current accreditation is set to expire;**
    - Florida Poly's next reaffirmation is 2032.

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e. The reason(s) the institution is seeking the change;

Put simply, Florida Poly is seeking this change because we believe HLC offers several opportunities for our students and the institution not currently present to us under our existing accreditation. As a result of Florida Poly's research, and collaboration within the Florida System, the Higher Learning Commission emerged as the best fit for Florida Poly. Factors contributing to this choice include:

- Capacity: HLC is the largest institutional accreditor with a staff and operations able to accommodate existing accredited institutions in a streamlined, accelerated process.
- Governance: HLC's exhibits a strong shared governance process where the agency actively engages member in policy and standards-making processes.
- Client-Focus: HLC displays a strong client-focused culture and has been highly responsive to interest from Florida institutions. HLC has set aside a special session at its Annual Meeting in March 2023 for Florida institutions seeking accreditation.
- Efficiency: HLC's decision-making processes occur approximately four-times per year, whereas SACSCOC makes decisions only twice per year. HLC also maintains a short timeline between routine requests for approval and final decisions, which facilitates institutional innovation and responsiveness to industry needs.
- Peers: Many of Florida Poly's institutional and aspirational peer institutions are members of HLC as illustrated by the following table.

Institution	Accrediting Organization
Aspirational	
Stevens Institute of Technology	Middle States Commission on Higher Education (MSCHE)
Rose-Hulman Institute of Technology	Higher Learning Commission (HLC)
Colorado School of Mines	Higher Learning Commission (HLC)
Rensselaer Polytechnic Institute	Middle States Commission on Higher Education (MSCHE)
Worchester Polytechnic	New England Commission of Higher Education (NECHE)
Peer	
Missouri University of Science and Technology	Higher Learning Commission (HLC)
New Mexico Institute of Mining and Technology	Higher Learning Commission (HLC)
Michigan Technological University	Higher Learning Commission (HLC)
Clarkson University	Middle States Commission on Higher Education (MSCHE)
Florida Institute of Technology	Southern Association of Colleges and Schools Commission on Colleges (SACSCOC)

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f. **If applicable, an explanation of how the institution believes the new agency would strengthen institutional quality; and**

It is important to begin with some context in order to address this topic. Florida Polytechnic University was created in 2012 by the Florida State legislature and welcomed its inaugural class in fall 2014. Now, in our 9th academic year, we have achieved accreditation candidacy, initial accreditation, and most recently reaffirmation from SACSCOC.

The accreditation process was enormously beneficial to the University's development and growth. One repeated concern from SACSCOC staff during each of these phases was the difficulty they had in finding reviewers from institutions similar to ours in the southern region. HLC is much larger and includes institutional reviewers on its teams from outside the region as well as within. Thus, the perspectives and inputs from an HLC visit provide greater opportunities for improvement.

As a new University, Florida Poly has undergone huge challenges. As we look toward our 10th academic year in operation, we will welcome it with a new University strategic plan. While this is still in development, our annual Board of Governors' Accountability Plan includes a "statement of strategy" that contextualizes the University, defines where we are in our development, and what our priorities are over short and long-term.

Statement of Strategy Florida Poly continues on its path to become an Engineering University of Distinction ranked in the top 15 of engineering schools nationwide that do not offer a doctoral program. For the coming year we will continue our focused strategy that integrates three critical areas: student quality and growth; faculty quality and growth; academic and student programs and services to support the needs of a residential campus focused on STEM education and industry relations.

The expansion of the student body and the attendant "impact" of the university requires Florida Poly to grow its degree programs so that it is a true polytechnic university with a strategic array of degree offerings. Over the next two years, the University will continue to explore potential academic programs that will expand our portfolio as an engineering school. We grow new degrees consistent with our principles to serve foundational and emerging disciplines, with strong future job demand.

The best and brightest students are attracted to, and increasingly demand, world-class faculty and programs. We are selectively hiring faculty across all our programs and our two-year hiring program that ends in fall of 2022 will have added approximately 25 highly qualified individuals to our campus. This a growth in over 30% of the faculty body. This hiring of faculty is underpinned by the principle that faculty are the keystone element in the institution, and we must add faculty to create an expanded and top engineering academic portfolio rich in applied research and of global significance.

Student programs and services is the third element of our integrated strategy that is focused on growth and excellence. Fall 2021 brought with it a "return to normal" for campus operations with a focus on both the instruction and campus life that a residential campus provides. Entering 2021 – 2022, we began multiple critical projects and changes to improve the quality of the campus. These included the creation of an Academic Review Board to directly address students at-risk, the piloting and roll out of a peer-led learning strategy program connected directly to our critical first-year courses in mathematics and the sciences. The objective of this program is to improve our APR with a notable emphasis on facilitating learning/achievement maturity in students with a goal producing student academic excellence with an improved quality of learning.

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> Our three-pronged strategy focused on student quality and growth; faculty quality and growth; and highly engaged academic and student programs and services sets the baseline for all planning at Florida Poly. Our mission is: "Serve students and industry through excellence in education, discovery, and application of engineering and applied sciences." The strategy that we have identified advances this mission with an overarching goal of joining the top fifteen engineering schools that do not grant a doctoral degree. As a small institution we continue to practice agility by proactively addressing areas of concern, building on our successes, and advancing our mission by growing the campus and our value to industry and the Florida economy.

Since its first semester, University enrollment has continued to grow. Starting from an incoming class of 560, we have grown to the almost 1600 students in Academic Year 2022-2023. The University is presently positioning itself for strong growth by building a new residence hall, adding research and classroom space, and building a student center. The University continues to produce high-quality graduates, awarding between 250 and 300 degrees annually over the last three years. Our student population is predominantly traditional aged and comes from throughout the state of Florida, but mainly from Polk County, where we are located, Tampa, and Miami areas. The student population is roughly 30% Pell-recipient, and our graduates start off making the highest salaries of all graduates in the University System.

Given the full context presented here, Florida Poly strongly supports a change to HLC because its operational efficiencies are more conducive to a new, start-up University whose mission includes being responsive to industry needs, which ultimately benefit our students who will work in those industries. HLC processes are modern, utilizing a strong portal system to streamline requests, reports, and exchanges of information that currently, under SACSCOC, remain still a mail-in process. HLC's Board also meets three times per year (rather than just twice) to make high-level decisions. Additionally, HLC's Institutional Actions Council (IAC), a body of peer reviewers that meets six to eight times per year, has the delegated authority to make routine approvals, thereby, providing institutions with more timely feedback as they attempt to respond to stakeholder needs and innovate.

A second reason Florida Poly believes HLC membership will strengthen its institutional quality is the stronger, more geographically and culturally diverse mix of quality, public four-year institutions that are HLC members. As noted above, HLC is home to more of Florida Poly's peer and aspirational peer institutions. This matters because adhering to principles of different agencies risks missing critical pieces of how our peers are successful in ways we are still trying to achieve. While one can simply attempt to copy a program from another institution, the benefit of operating by the same standards is that the nuance of interpretation will also be shared, helping us more accurately address the challenges we face. A common standard and the resulting programs and practices to support that compliance necessarily drives resource allocation, which may not be justifiable under a different agency.

A third reason for changing to HLC is in the area of Governance. Below, we discuss how specific standards in Governance can benefit Florida Poly's students. But Florida Poly will also benefit from the shared governance process that HLC embraces, particularly as it relates to policy and standards changes where ample opportunities for member input are available. The HLC process is more iterative ensuring in the end, better policy, and better shared practices for implementing and complying with those policies. A few more specific examples of HLC's governance and stakeholder engagement include:

- Regular contact with governing boards, which supports common understanding of priorities, standards, rules, and other practices that impact all institutions.

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- Engages in its own continuous improvement process via tools like annual members' survey.
- Engages all members in its policy review processes rather than a subset with the authority to review, comment, and approve. HLC has a minimum of two readings and reviews before a policy can be adopted.

g. If applicable, how the new agency's standards are more closely aligned with the institution's mission.

In collaboration with our Florida sister institutions, Florida Poly has analyzed standards crosswalks between our current accreditor and the five other candidates. While there are differences among all of the agencies, our focus was less on how closely SACSCOC aligns with a prospective accreditor, but on how the standards that do not match can enhance the University and Florida Poly students.

In reviewing HLC standards alongside SACSCOC Principles, we find a great deal of alignment, although some HLC standards are addressed in different types of compliance documents rather than all in one. For example, HLC's eligibility requirements, which must necessarily be met for consideration as a member institution, gather together several SACSCOC Principles that are otherwise distributed. By separating these standards, HLC emphasizes the critical importance and focus of standards related to student success and quality improvement, facilitating member institutions' focus on these important aspects.

HLC has eight standards that do not appear either directly or obliquely in the SACSCOC Principles. These can be grouped and summarized as follows:

- Institutional Governance
- Civic Engagement and standards related to living and working in a global context
- Faculty – Student scholarship.

Governance under HLC standards requires broader, constituent-based input. Students and staff ("where appropriate") are expected to be included in setting academic requirements, policies, and processes. While Florida Poly does engage these constituents in many areas of University governance, the benefit of conducting self-study to determine compliance with an explicit requirement is that it will continue to push Florida Poly to reevaluate and mature many of these operations. Student engagement and student satisfaction are critical to our success and to the students themselves. The University will benefit from having to reconsider how it engages its students in these capacities and the appropriate boundary conditions that will facilitate the growth of a campus where students want to live and learn.

Several HLC standards not found in SACSCOC directly address civic engagement and graduating students who have experience through their degree program to be successful working in a global environment. Civic engagement has been a priority in Florida in higher education for many years, and this standard brings into alignment those activities with accreditor expectations. The opportunity created by this standard means that our efforts can be more meaningfully integrated in different aspects of campus life. As engineers and applied scientists, it is critical that our graduates demonstrate a knowledge and facility with understanding and working in diverse cultures and in a global context. While this is an expectation for our ABET accredited programs, the positioning of it at the institutional level with accreditation compliance implications presents an opportunity to think through all aspects of student curricular and co-curricular experience supports all of our majors.

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HLC also includes a standard specifically related to faculty and student scholarship. While at this time, we are not fully read-in on the nuances of this standard, the emphasis on student-faculty collaboration is, again, something we already do, but not in a fully conceived institutional context. This standard likewise gives us the opportunity to build this systemically to the benefit of students and faculty alike.

One final point to make on this topic. The benefits of membership are not limited simply to having to address some different standards that may align strategically with a University's plan. Rather, membership means access to the wisdom and experience of all member institutions that also have to address *these* specific things. Engagement with an accreditor is not just about shaping an institution to ensure compliance with standards and best practices, but it is also about participating in the dialogue around these issues with other member institutions.

TIMELINE

Florida Polytechnic University's next scheduled accreditation review is the 5th year review, due in 2028. Backing up from there with two years of preparation puts us in 2026 to earnestly begin building the report and gathering the evidence. Considering preparation time needed for an HLC application and the subsequent processing and review time, we respectfully ask the U.S. Department of Education for its decision by August 2023.

Documentation from Current Primary Accrediting Agency

a. Most recent determination letter
b. Documentation that the institution remains in good standing since the determination letter; and
c. Any substantive correspondence or other communications with the agency relating to the institution's accreditation status, requests for information, or inquiries since the most recent determination letter.
d. Substantive correspondence, if applicable, with the new accrediting agency relating to the institution's planned application.

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This content is from the eCFR and is authoritative but unofficial.

Title 34 - Education
Subtitle B - Regulations of the Offices of the Department of Education
Chapter VI - Office of Postsecondary Education, Department of Education
Part 600 - Institutional Eligibility Under the Higher Education Act of 1965, as Amended
Subpart A - General

Source: 59 FR 22336, Apr. 29, 1994, unless otherwise noted.
Authority: 20 U.S.C. 1001, 1002, 1003, 1088, 1091, 1094, 1099b, and 1099c, unless otherwise noted.
Source: 53 FR 11210, Apr. 5, 1988, unless otherwise noted.

§ 600.11 Special rules regarding institutional accreditation or preaccreditation.

(a) ***Change of accrediting agencies.***

(1) For purposes of §§ 600.4(a)(5)(i), 600.5(a)(6), and 600.6(a)(5)(i), the Secretary does not recognize the accreditation or preaccreditation of an otherwise eligible institution if that institution is in the process of changing its accrediting agency, unless the institution provides the following to the Secretary and receives approval:

(i) All materials related to its prior accreditation or preaccreditation.

(ii) Materials demonstrating reasonable cause for changing its accrediting agency. The Secretary will not determine such cause to be reasonable if the institution -

(A) Has had its accreditation withdrawn, revoked, or otherwise terminated for cause during the preceding 24 months, unless such withdrawal, revocation, or termination has been rescinded by the same accrediting agency; or

(B) Has been subject to a probation or equivalent, show cause order, or suspension order during the preceding 24 months.

(2) Notwithstanding paragraph (a)(1)(ii) of this section, the Secretary may determine the institution's cause for changing its accrediting agency to be reasonable if the agency did not provide the institution its due process rights as defined in § 602.25, the agency applied its standards and criteria inconsistently, or if the adverse action or show cause or suspension order was the result of an agency's failure to respect an institution's stated mission, including religious mission.

(b) ***Multiple accreditation.*** The Secretary does not recognize the accreditation or preaccreditation of an otherwise eligible institution if that institution is accredited or preaccredited as an institution by more than one accrediting agency, unless the institution -

(1) Provides to each such accrediting agency and the Secretary the reasons for that multiple accreditation or preaccreditation;

(2) Demonstrates to the Secretary reasonable cause for that multiple accreditation or preaccreditation.

(i) The Secretary determines the institution's cause for multiple accreditation to be reasonable unless the institution -

(A) Has had its accreditation withdrawn, revoked, or otherwise terminated for cause during the preceding 24 months, unless such withdrawal, revocation, or termination has been rescinded by the same accrediting agency; or

(B) Has been subject to a probation or equivalent, show cause order, or suspension order during the preceding 24 months.

(ii) Notwithstanding paragraphs (b)(2)(i)(A) and (B) of this section, the Secretary may determine the institution's cause for seeking multiple accreditation or preaccreditation to be reasonable if the institution's primary interest in seeking multiple accreditation is based on that agency's geographic area, program-area focus, or mission; and

(3) Designates to the Secretary which agency's accreditation or preaccreditation the institution uses to establish its eligibility under this part.

(c) ***Loss of accreditation or preaccreditation.***

(1) An institution may not be considered eligible for 24 months after it has had its accreditation or preaccreditation withdrawn, revoked, or otherwise terminated for cause, unless the accrediting agency that took that action rescinds that action.

(2) An institution may not be considered eligible for 24 months after it has withdrawn voluntarily from its accreditation or preaccreditation status under a show-cause or suspension order issued by an accrediting agency, unless that agency rescinds its order.

(d) ***Religious exception.***

(1) If an otherwise eligible institution loses its accreditation or preaccreditation, the Secretary considers the institution to be accredited or preaccredited for purposes of complying with the provisions of §§ 600.4, 600.5, and 600.6 if the Secretary determines that its loss of accreditation or preaccreditation -

(i) Is related to the religious mission or affiliation of the institution; and

(ii) Is not related to its failure to satisfy the accrediting agency's standards.

(2) If the Secretary considers an unaccredited institution to be accredited or preaccredited under the provisions of paragraph (d)(1) of this section, the Secretary will consider that unaccredited institution to be accredited or preaccredited for a period sufficient to allow the institution to obtain alternative accreditation or preaccreditation, except that period may not exceed 18 months.

(Authority: 20 U.S.C. 1099b)

[59 FR 22336, Apr. 29, 1994, as amended at 85 FR 58916, Nov.1, 2019]

UNITED STATES DEPARTMENT OF EDUCATION
OFFICE OF POSTSECONDARY EDUCATION
ACCREDITATION GROUP

July 19, 2022

Institutional Accrediting Agencies:

Recently, the Department of Education (Department) has received inquiries regarding the "voluntary membership" requirement for federally recognized accrediting agencies in 34 C.F.R. § 602.14(a). In this letter, we respond to those inquiries and clarify the voluntary membership requirement of the accreditation regulations.

Historically, accreditation in the United States began with a voluntary association of institutions of higher education that sought to develop a consensus on the content of the educational programs offered by postsecondary educational institutions and on the distinctions between educational offerings at secondary and postsecondary institutions.[1] By the 1970s, most institutions of higher education voluntarily participated in the accreditation process to ensure a mark of quality and a common level of academic standards for their respective institutions.[2]

Congress, in creating the overall statutory schema for higher education starting with the Higher Education Act of 1965 (HEA), recognized the importance of an institution of higher education's voluntary membership in an accrediting agency or accrediting association beginning with the Higher Education Amendments Act of 1992.[3] Indeed, a voluntary association for quality assurance, as opposed to a compelled one, or even one centralized through or by the federal government, is one of the unique features of American higher education. This voluntary association is intended to engender a willing and cooperative environment for the review and improvement of educational programs at American institutions of higher education.

Similarly, through the Higher Education Amendments Act of 1992, Congress established the concept of the program integrity triad, consisting of States, accrediting agencies, and the Department. The members of the triad work together to ensure quality in higher education, but with distinct principal areas of responsibility for each member.

The Department, following the statutory schema of the 1992 HEA reauthorization, included the voluntary requirement in its initial accreditation regulations in 1994.[4] Today, "voluntary membership" remains a requirement for the Secretary's recognition of accrediting agencies under § 602.14(a)(2), (a)(3), and (a)(4). As used in § 602.14, the word "voluntary" is important

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[1] CRS report, *An Overview of Accreditation of Higher Education in the United States* at 1, *available at* https://crsreports.congress.gov/product/pdf/R/R43826/10.
[2] *Id.* at 2.
[3] *See* 20 USC § 1099b(a)(2) (1994).
[4] *See* 59 FR 3580 (January 24, 1994), *available at* https://www.govinfo.gov/content/pkg/FR-1994-01-24/pdf/FR-1994-01-24.pdf.

in defining the expected nature and quality of the relationship between an accrediting agency and the institutions it accredits.

Because the requirement of voluntary association between accrediting agencies and institutions has been an accepted norm, the Department has not previously had reason to further consider the requirement. However, Florida law SB 7044, which took effect on July 1, 2022, requires public institutions in Florida to seek new accrediting agencies, which potentially undermines the voluntary nature of the relationship and the independent roles of the various actors in the triad. Thus, the Department has reexamined the issue of voluntary membership in two circumstances: when institutions seek to change accrediting agencies (or seek multiple accreditation) and when the Department reviews accrediting agencies as part of the recognition process.

Under 20 USC 1099b(h) and (i) and § 600.11(a) and (b), institutions must submit materials to the Department demonstrating reasonable cause for changing their accrediting agency or for having multiple accrediting agencies. This requirement provides critical protections for students and taxpayers by ensuring that institutions do not switch accrediting agencies simply to evade accountability, avoid open inquiries, or seek approval from an agency with less rigorous standards. In a Dear Colleague Letter (DCL) published today, the Department has clarified that institutions must submit to the Department such materials ***and*** receive Departmental approval ***prior to*** submitting their application to a new accrediting agency.[5] The Department has further clarified that, as part of its review, it will consider the rationale provided, the institution's history of compliance, and past accrediting agency actions.[6] Because the Department only recognizes accrediting agencies that have a voluntary membership of institutions of higher education, in reviewing for "reasonable cause" for changing or adding accreditors, the Department will also consider whether the materials provided support a finding that the institution's membership in the new accrediting agency would be voluntary. Following its review of the materials, the Department will notify the institution whether the Department has determined there is reasonable cause for the change (or multiple accreditation).

As required under § 602.14, the Department will also examine the issue of voluntariness when it conducts its agency recognition review. Even if the Department has found, based on the information available to the Department at the time of review, reasonable cause under § 600.11, ***agencies should conduct their own independent evaluation of whether an institutional change of accrediting agencies (or multiple accreditation) is voluntary***. Because an accrediting agency's relationships with its member institutions are case- and fact-specific, the agency may come to a different conclusion than the Department. To help avoid a finding of noncompliance with § 602.14, agencies should consider whether accrediting an institution will compromise the voluntary nature of their membership **prior to** approving a membership application.

Even if the Department has found reasonable cause with respect to an agency's member institutions pursuant to a review under § 600.11, it will again consider all relevant factors, based on the most recently available information, when conducting a recognition review under § 602.14. If, after having reviewed all the relevant factors, the Department determines that an

[5] https://fsapartners.ed.gov/knowledge-center/library/dear-colleague-letters/2022-07-19/procedures-institutions-seeking-approval-request-change-or-add-accrediting-agencies
[6] https://fsapartners.ed.gov/knowledge-center/library/dear-colleague-letters/2022-07-19/guidance-institutions-seeking-change-or-add-accrediting-agencies

accrediting agency does not have a voluntary membership, as required for recognition by the Department under section 1099b(a)(2) of the HEA and § 602.14(a), the Department will be unable to recognize the accrediting agency.

We hope that this letter provides clarification regarding these questions to the accreditation community, and we thank you for your engagement with the Department as we all work to address and participate in a changing landscape consistent with existing law.

Sincerely,

/s/

Herman Bounds Jr., Ed.S
Director, Accreditation Group

Federal Student Aid

An OFFICE of the U.S. DEPARTMENT of EDUCATION

Published on https://fsapartners.ed.gov/knowledge-center/library/dear-colleague-letters/2022-07-19/guidance-institutions-seeking-change-or-add-accrediting-agencies

PUBLICATION DATE: July 19, 2022
DCL ID: GEN-22-10
SUBJECT: Guidance for Institutions Seeking to Change or Add Accrediting Agencies

SUMMARY: The Department has recently received several inquiries regarding the standards and procedures for an institution seeking to change its primary accrediting agency or obtain multiple accreditations. The purpose of this announcement is to reiterate the statutory and regulatory standards and to provide examples of factors Federal Student Aid (FSA) may consider in determining whether an institution has provided sufficient materials demonstrating reasonable cause for changing or adding an accrediting agency.

Please note that companion DCL ID GEN-22-11, dated July 19, 2022, describes the procedures institutions must follow to change or add an accrediting agency.

Dear Colleague:

Under section 496(h) of the Higher Education Act of 1965, as amended, (HEA) (20 U.S.C. 1099b(h)), an institution seeking to change its accrediting agency must submit to FSA all materials relating to the prior accreditation and materials demonstrating reasonable cause for changing the accrediting agency. This requirement helps prevent an erosion of accrediting agency standards and provides critical protections for students and taxpayers by ensuring that institutions do not switch accrediting agencies simply to evade accountability, avoid open inquiries, or seek approval from an agency with less rigorous or easier-to-meet standards.

The Department has implemented this statutory requirement via 34 CFR § 600.11(a), which requires an institution to provide all materials related to its prior accreditation or preaccreditation, to provide materials demonstrating reasonable cause for changing its accrediting agency, and to receive the Department's approval prior to switching accrediting agencies. In this announcement, the Department is further detailing its expectations and requirements to ensure that institutions are aware of the standards to which they will be held if they seek to change their accrediting agency-of-record with FSA and/or maintain accreditation with multiple institutional agencies. We remind institutions that, in evaluating an institution's demonstration of reasonable cause for doing so, the Department will consider the institution's history of compliance, past accrediting agency actions, open inquiries, and the rationale provided, as described further in this guidance.

Reasonable Cause

To carry out its responsibilities under 34 CFR § 600.11, FSA must make a reasonable cause determination.

Under § 600.11(a) and (b), except in the circumstances described in the following paragraph, FSA will **not** determine an institution's cause to be reasonable if the institution:

- Has had its accreditation withdrawn, revoked, or otherwise terminated for cause during the preceding 24 months, unless such withdrawal, revocation, or termination has been rescinded by the same accrediting agency.
- Has been subject to a probation or equivalent, show cause order, or suspension order during the preceding 24 months.

Notwithstanding the foregoing, under 34 CFR § 600.11, FSA may determine the institution's cause for changing its accrediting agency to be reasonable under such circumstances if the existing agency did not provide the institution its due process rights as defined in 34 CFR § 602.25, the agency applied its standards and criteria inconsistently, or if the adverse action or show cause or suspension order was the result of an agency's failure to respect an institution's stated mission, including religious mission. Further, FSA may determine the institution's cause for seeking multiple accreditations to be reasonable if the institution's primary interest in seeking multiple accreditations is based on its geographic area, program area focus, or mission.

In all other cases, in making a reasonable cause determination, FSA must review the specific circumstances of the institution, which may include the institution's past history of compliance with the requirements of its accrediting agency, the Department, or other oversight agencies; the institution's financial stability; and other information about the institution available to FSA. FSA may consider factors such as the following when evaluating a proposed change in accrediting agencies (or an application to have more than one institutional accrediting agency):

1. The institution's stated reason for the proposed change or multiple accreditations.
2. Whether the institution is seeking to change accrediting agencies or multiple accreditations to lessen oversight or rigor, evade inquiries or sanctions, or the risk of inquiries or sanctions by its existing accrediting agency.
3. Whether the proposed change of agencies or multiple accreditations would strengthen institutional quality.
4. Whether the institution is seeking to change agencies or seeking multiple accreditations because the new agency and its standards are more closely aligned with the institution's mission than the current accrediting agency.
5. Whether the proposed change or addition involves an accrediting agency that has been subject to Department action.
6. Whether, if ultimately approved by the Department and the accrediting agency, the institution's membership in the accrediting agency would be voluntary, as required for recognition of the accrediting agency under 34 CFR § 602.14(a).

The Department sent a letter to federally recognized institutional accrediting agencies further detailing the significance of voluntary membership in accrediting decisions as required under 34 CFR § 602.14(a). That letter is available at the Office of Postsecondary Education's website.

As part of its reasonable cause determination, FSA may request records from the institution's current accrediting agency. In all cases, it is incumbent on the institution to provide sufficient evidence to demonstrate the reasonableness of the requested change.

Contact Information

For more information, please contact the Department at CaseTeams@ed.gov.

Sincerely,

Annmarie Weisman
Deputy Assistant Secretary for Policy, Planning, and Innovation
Office of Postsecondary Education

Federal Student Aid
An OFFICE of the U.S. DEPARTMENT of EDUCATION

Published on https://fsapartners.ed.gov/knowledge-center/library/dear-colleague-letters/2022-07-19/procedures-institutions-seeking-approval-request-change-or-add-accrediting-agencies-updated-sept-26-2022

PUBLICATION DATE: July 19, 2022
DCL ID: GEN-22-11
SUBJECT: Procedures for Institutions Seeking Approval of a Request to Change or Add Accrediting Agencies (Updated Sept. 26, 2022)

SUMMARY: This letter provides guidance on the process institutions must follow that are seeking to change primary accrediting agencies or that are adding multiple accrediting agencies.

Note

On Sept. 26, 2022, we updated the numbered list in the third paragraph of this Dear Colleague Letter to provide additional guidance regarding the information an institution needs to submit to the School Participation Division for its initial request to change accrediting agencies before the institution submits an application to the new agency. The School Participation Division may also request additional documents or information to complete its review.

Please note that companion DCL ID GEN-22-10, dated July 19, 2022, describes the policy guidance institutions must follow to change or add an accrediting agency.

Dear Colleague:

In a previous Electronic Announcement published Aug. 5, 2016, the Department reminded institutions of the requirements for seeking FSA approval of a change of primary accrediting agency, including the documentation an institution must submit to FSA in support of a request to change a primary accrediting agency. The Department also specified the procedures for submitting such documentation. This communication updates the procedures for submitting documentation to change or add an accrediting agency by requiring an institution to submit the required documentation to the Department **prior to** submitting an application to a new accrediting agency. Accordingly, this communication revokes and supersedes the Aug. 5, 2016, announcement. To the extent institutions have begun the process of changing or adding an accrediting agency and relied on the 2016 EA, they must immediately inform the Department consistent with the procedures described below.

Under 34 CFR § 600.11(a) and (b), respectively, the Secretary does "not recognize the accreditation or preaccreditation" of an institution "that is ***in the process*** of changing accrediting agencies" or that is accredited or preaccredited "by more than one accrediting agency" unless the institution provides the Department information demonstrating "reasonable cause" for changing or adding accrediting agencies and receives Department approval. Therefore, to ensure that an institution maintains recognition of its accreditation or preaccreditation under 34 CFR § 600.11, an institution must provide the required information and obtain the Department's approval **prior to** submitting an application to a new accrediting agency. We believe that these procedures are in better alignment with the requirements of 34 CFR § 600.11, will provide clarity to institutions and afford them earlier information about Department approval, and will help protect institutions from an inadvertent loss of Title IV eligibility.

Accordingly, an institution must take the following steps to change its primary accrediting agency or add a new accrediting agency:

1. **Prior to submitting an application to the new accrediting agency**, an institution must notify FSA in writing of its intent to change its primary accrediting agency or add a new accrediting agency. With its notification, the institution must submit to FSA documentation of its current accreditation and materials demonstrating reasonable cause for changing or adding an accrediting agency. Institutions should submit this notification and required documentation via email to CaseTeams@ed.gov with a subject line "Notification Regarding Accreditation." An institution should include with this notification the materials required by 34 CFR 600.11(a)(1), for a change of primary accrediting agency or 34 CFR 600.11(b)(1) through (3), for multiple accrediting agencies, including a cover letter that includes the following:
    a. The name of the institution's current primary accrediting agency and the name of the institution's proposed new agency;

b. Whether the institution is seeking to change primary accrediting agencies or seeking multiple accreditation;

c. If the institution is seeking multiple accreditation, whether the institution plans to relinquish accreditation by its current primary accrediting agency and, if so, the timeframe for relinquishment;

d. The date that the institution's current accreditation is set to expire;

e. The reason(s) the institution is seeking the change;

f. If applicable, an explanation of how the institution believes the new agency would strengthen institutional quality; and

g. If applicable, how the new agency's standards are more closely aligned with the institution's mission.

The institution must also provide supporting materials demonstrating reasonable cause for the change, including documentation to support the institution's claim that it has reasonable cause to change accrediting agencies (or have multiple accrediting agencies).

The institution must include the following documentation from its current primary accrediting agency:

a. Most recent determination letter;

b. Documentation that the institution remains in good standing since the determination letter; and

c. Any substantive correspondence or other communications with the agency relating to the institution's accreditation status, requests for information, or inquiries since the most recent determination letter.

Finally, the institution must provide any substantive correspondence or other communications with the new accrediting agency, including any substantive correspondence or other communications with the agency relating to the institution's planned application. Note that non-substantive communications — such as routine scheduling — do not need to be provided.

2. Prior to submitting its application to the new accrediting agency, the institution must receive notification from FSA that the institution (a) has provided all the required documentation, (b) has demonstrated reasonable cause for changing its primary accrediting agency or for maintaining accreditation by multiple agencies, and (c) has the Department's approval under
34 CFR 600.11.

3. Once the institution has received the notification from FSA described in Step 2 and has ***secured new accreditation*** (or, for nonprofit or public institutions, preaccreditation by an agency that is recognized by the Department to grant preaccreditation status), it must formally notify FSA of the new accreditation in the online electronic application (E-App) and update the "primary accreditor" indicator if it is changing. The institution should include documentation of its accreditation or preaccreditation by the new agency as part of the supporting information it provides to FSA through the E-App process. The institution must also submit a copy of the notification that it received from FSA in response to the first step of these procedures. The institution was required to receive this notification before submitting an application to the new accrediting agency.

An institution should not drop its association with its current accrediting agency until after (a) the Department has approved the institution's request to change its primary accrediting agency or add an accrediting agency, (b) the new agency has granted accreditation to the institution, and (c) the Department has provided written notice that it acknowledges the new accrediting agency as the institution's primary accrediting agency or the multiple accreditations. Failure to comply with these procedures may result in the institution's accreditation status not being recognized by the Secretary and could result in a loss of Title IV eligibility.

Contact Information

For more information, please contact the Department at CaseTeams@ed.gov.

Sincerely,

Richard Cordray
Chief Operating Officer
Federal Student Aid

ACCREDITATION

Overview

Accreditation is a process of external review used by the higher education community to assure quality & promote ongoing improvement. Accreditors are private, non-profit organizations whose members are colleges & universities.

The primary functions of accreditation agencies include the following.

- Assess the quality of academic programs at institutions of higher education.
- Create a culture of continuous improvement at colleges & universities & stimulate a general raising of standards among universities.
- Involve faculty & staff extensively in university evaluation & planning.

Accreditation relies on a rigorous peer-review process to define & evaluate whether universities meet high standards. While each accreditor establishes standards, the standards must meet basic federal requirements to ensure consistency across accrediting agencies. Accreditors regularly assess member institutions to ensure the institutions continue to meet the standards.

As part of information gathering for this document, Board staff completed the following.

- Review of accreditor websites, bylaws, & accreditation standards
- Regular meetings with accreditation liaisons from all 12 State University System universities
- Meetings with accreditor representatives
- Meetings with Florida College System representatives

This document provides information on the following topics across six identified accreditors.

Background | Governance | Standards | Process | Costs

Table of Contents

Executive Summary

Recommendations & Findings

Board of Governors Staff has identified the following additional accreditors as suitable for the State University System of Florida

HIGHER LEARNING COMMISSION

MSCHE MIDDLE STATES COMMISSION ON HIGHER EDUCATION

NECHE New England Commission of Higher Education

NWCCU NORTHWEST COMMISSION ON COLLEGES AND UNIVERSITIES

WASC Senior College and University Commission

Quality & Governance	• Each accreditor states it prioritizes academic quality & inclusive governance
Standards	• Standards are generally comparable across all accreditors with nuanced differences • A comprehensive review of each accreditor's standards is needed by individual universities
Accreditation Processes	• Four accreditors have developed streamlined processes for reviewing currently accredited universities in good standing, & the fifth (MSCHE) is in the process of developing a process
Costs	• The majority of costs universities incur are expenses required to maintain accreditation • University expenses will temporarily increase during the transition to a new accreditor
Accrediting Agency Membership	• HLC (995) & MSCHE (519) have the largest number of member institutions • The membership of each accreditor includes universities in the Top 100 public universities ranked by U.S. News & World Report • Four of the accreditors accredit members of the Association of American Universities (AAU)
Additional Considerations	• Each accreditor will differ in its ability & willingness to accommodate new members • Each accreditor's governing board determines the extent to which the accreditor can expand membership • Accreditation liaisons from the State University System's 12 universities have noted there is a beneficial synergy to having all universities accredited by the same accreditor

The leadership of each state university will need to review these factors in light of missions, goals, & priorities to determine which accreditor would be the best fit.

State University System of Florida

Initial Accreditation

SACSCOC
SOUTHERN ASSOCIATION OF COLLEGES AND SCHOOLS
COMMISSION ON COLLEGES

- **Florida public universities are accredited by the Southern Association of Colleges & Schools Commission on Colleges (SACSCOC), established in 1895**
- **This accreditation status allows course credits from Florida public universities to transfer to other accredited universities, enables distribution of federal student aid funds to students, & permits access to federal grant funds**

1910 1920 1930 1940 1950 1960 1970 1980 1990 2000 2010 2020

1913 UF University of Florida

1915 Florida State University 1851

1935 FAMU Florida Agricultural and Mechanical University

1965 University of South Florida

1967 New College The Honors College of Florida; FAU Florida Atlantic University

1969 University of West Florida

1970 UCF University of Central Florida

1974 UNF University of North Florida; FIU Florida International University

1999 Florida Gulf Coast University

2017 Florida Polytechnic University

Federal Requirements

Recognition of Accrediting Agencies

- **Accreditors recognized by the U.S. Department of Education (USDOE) must follow certain criteria**
  - Ensure its ability to provide a quality education
  - Help facilitate the smooth transfer of credits among colleges & universities
  - Promote confidence to private sector employers who hire its graduates
- **Universities accredited by recognized agencies may distribute federal student aid & are eligible for federal grants**

Requirements for Accreditor Standards

Accreditors must consider the following information when developing accreditation standards

- Student achievement
- Curricula
- Faculty
- Facilities, equipment, & supplies
- Fiscal & administrative capacity
- Student support services
- Recruiting & admissions practices
- Academic calendars, catalogs, publications, grading, & advertising
- Student complaints
- Program length*
- Degree or credential objectives*
- Compliance with program responsibilities under Title IV of the Higher Education Act**
- Preaccreditation standards
  - Related to the accreditation standards
  - Five-year limit on preaccreditation status

Requirements for Accreditor Monitoring & Reevaluation of Member Institutions

Accreditors must monitor & reevaluate institutions, collect reports, & track institutional growth

- Reevaluate institutions regularly
- Monitor & evaluate to identify issues
- Collect periodic reports & key indicators of performance
  - Fiscal
  - Student achievement
  - Additional reports
- Monitor institutional growth
- Collect annual head-count enrollment data
- Monitor program growth at institutions experiencing significant enrollment growth

Requirements for Accreditor Internal Review of Standards

Accreditors must internally review accreditation standards

- Comprehensive
- Occur at regular intervals or on an ongoing basis
- Examine standards separately & as a whole
- Involve all constituencies
- Allow meaningful input from constituents
- Before finalizing changes:
  - Provide notice to relevant constituencies
  - Allow constituencies to comment
  - Review & respond to any comments

*This does not apply if none of the institutions the agency accredits participate in any Title IV Higher Education Act programs or if the agency only accredits programs within institutions accredited by a recognized institutional accrediting agency.
**This does not apply if the institution does not participate in any Title IV Higher Education Act programs.

Accreditor Types

National & Regional Accreditors

- **The USDOE currently recognizes both regional & national accrediting agencies as "institutional" accreditors**
- **Regional accreditors accredit institutions comparable to those in the State University System of Florida**

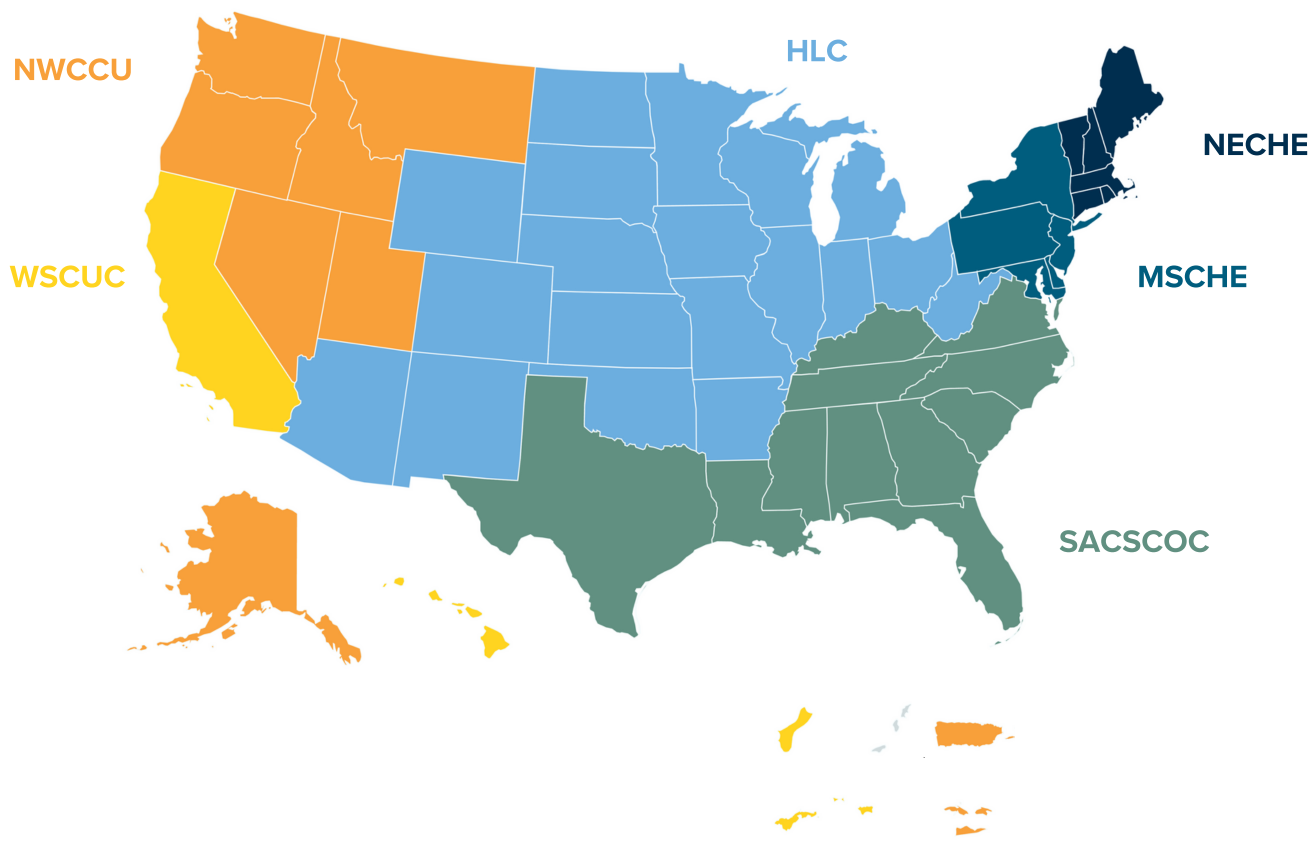
	Formerly Regional Accreditors	Formerly National Accreditors
Scope	Majority are public & non-profit private	Majority are for-profit
Member Institutions	Focus on comprehensive degree-granting institutions including all AAU & US News & World Report Top 100 public institutions	Focus on trade & vocational schools, career programs, faith-based institutions, & online colleges
Credit Transfers	Credits widely accepted	Credits not widely accepted
# of Accreditors Recognized by the USDOE	6	20
Accrediting Agencies Recognized by the USDOE	**SIX REGIONAL ACCREDITORS** • Higher Learning Commission (HLC) • Middle States Commission on Higher Education (MSCHE) • New England Commission of Higher Education (NECHE) • Northwest Commission on Colleges & Universities (NWCCU) • Southern Association of Colleges & Schools Commission on Colleges (SACSCOC) • WASC Senior Colleges & Universities Commission (WSCUC)	**EXAMPLES OF NATIONAL ACCREDITORS** • Accrediting Commission of Career Schools & Colleges • Accrediting Council for Continuing Education & Training • Council on Occupational Education • Association for Biblical Higher Education, Commission on Accreditation • Association of Institutions of Jewish Studies • National Association of Schools of Dance, Commission on Accreditation • National Association of Schools of Music, Commission on Accreditation • Distance Education Accrediting Commission

Accrediting Agency Types

Regional Accrediting Agencies

- **Regional accreditors historically served specific regions of the country**
- **As of July 2020, accreditors are allowed to accredit institutions outside traditional regional boundaries**
- **All regional accreditors require a reaffirmation review every 6-10 years**

Traditional Regional Accreditor Boundaries (Pre-2020)



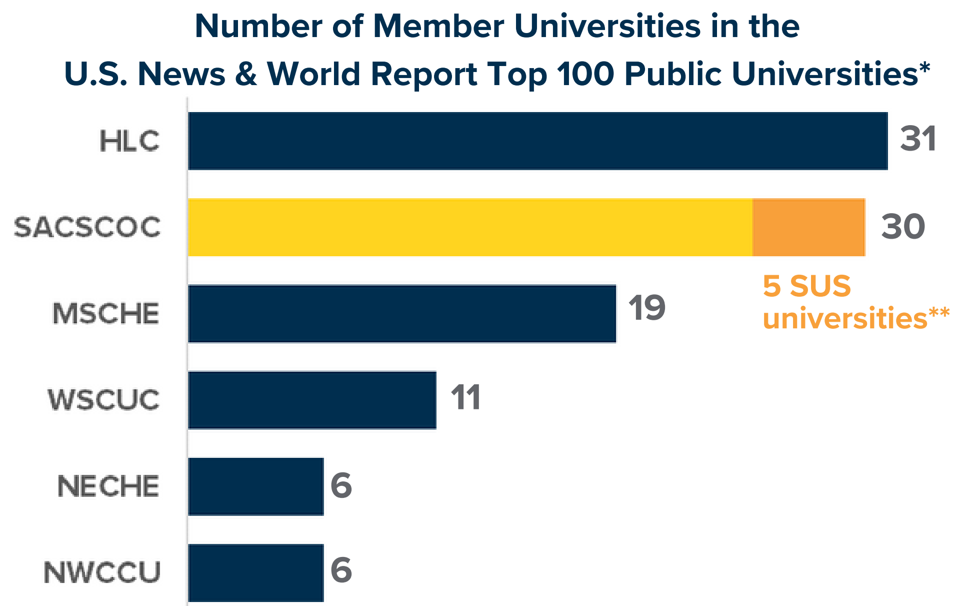
Accreditor Processes	SACSCOC	HLC	MSCHE	NECHE	NWCCU	WSCUC
Mid-Point Review	5th Year	4th Year*	No mid-point review	5th Year	3rd Year	No mid-point review
Accreditation Cycle	10 Years	10 Years	8 Years	10 Years	7 Years	6, 8, or 10 Years**

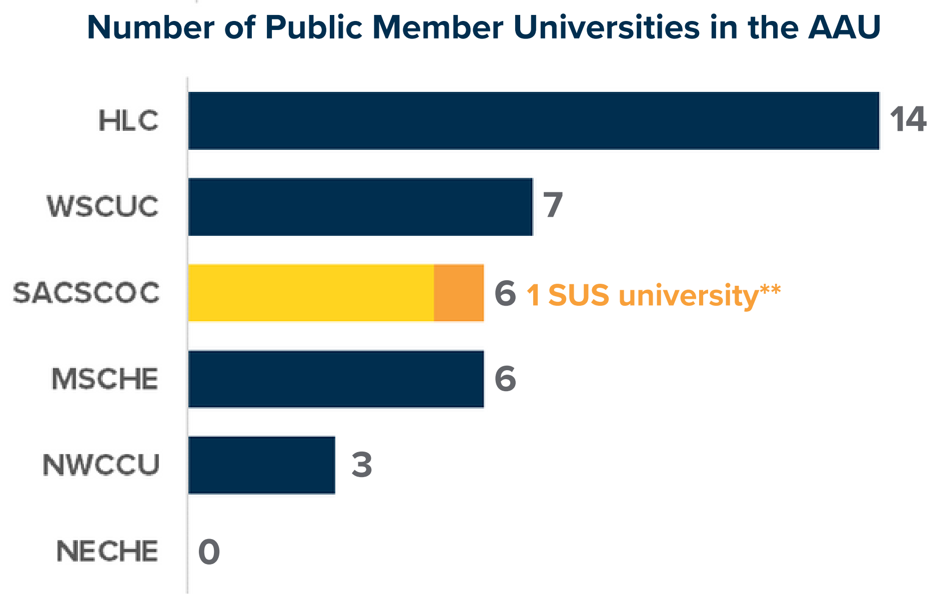
*HLC offers two pathways to accreditation: Standard Pathway & Open Pathway. The Standard Pathway includes a comprehensive evaluation in year 4. The Open Pathway includes an assurance review in year 4 & a quality initiative in years 5-9.
**WSCUC noted that most institutions initially accredited will be put on a 6 year cycle; however, the cycle may vary based on the readiness of the institution.
Source: Map from the Council of Higher Education Accreditation

Background

Member Institutions of Regional Accreditors

- **All public universities on the U.S. News & World Report Top 100 Public Universities list are accredited by regional accreditors**
- **All public universities within the Association of American Universities (AAU) are accredited by regional accreditors**





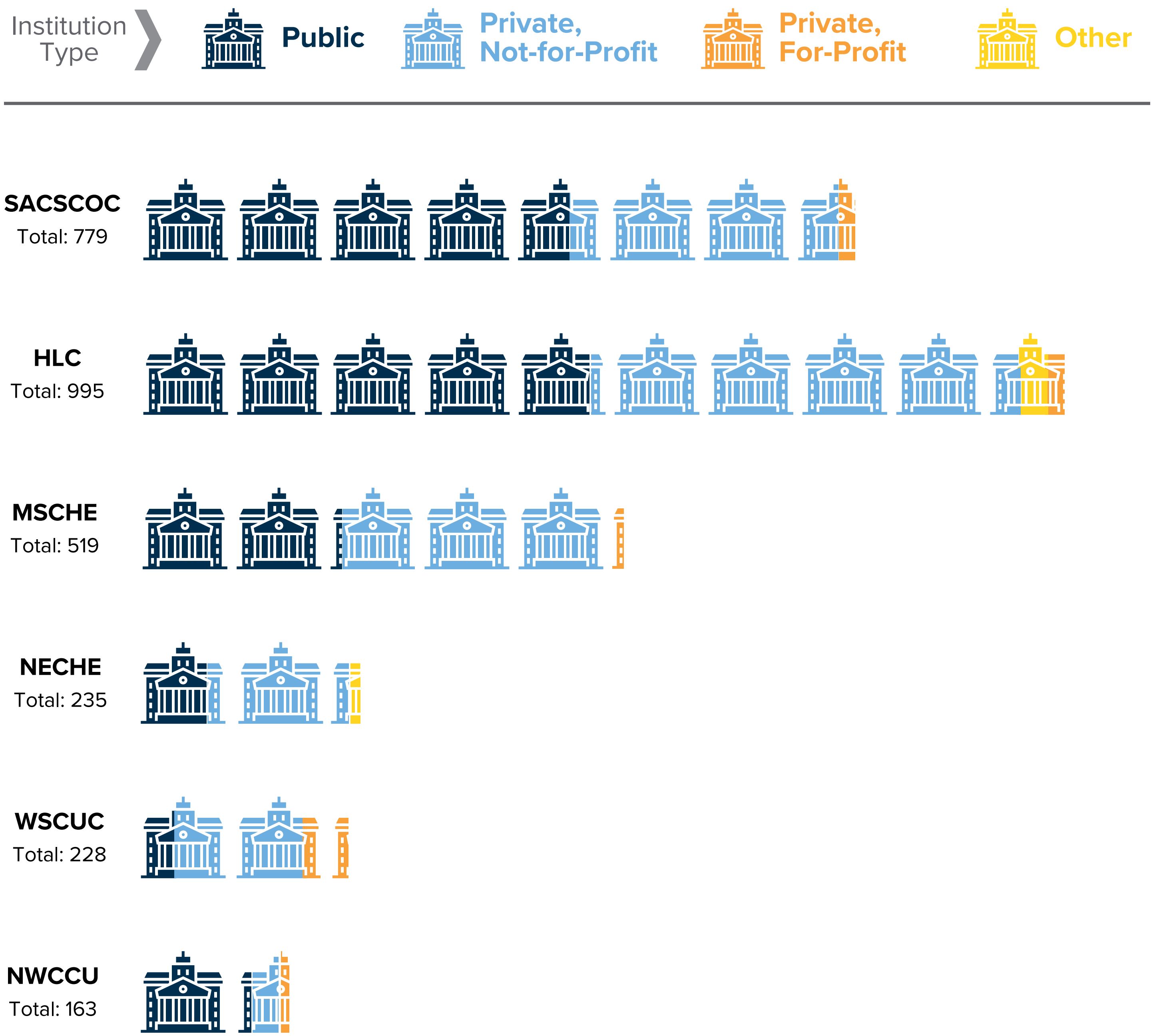
**The SUS universities in the U.S. News & World Report Top 100 Public Universities list are University of Florida (5th), Florida State University (19th), University of South Florida (46th), University of Central Florida (67th), & Florida International University (78th). The only SUS university in the AAU is University of Florida.

*Total adds to 103 institutions because of ties in the rankings.

Background

Member Institutions by Type

- **SACSCOC & HLC have the largest number of member institutions**
- **HLC has the most similar institutional makeup compared to SACSCOC**
- **NWCCU has the highest proportion of public institution membership**



Note: Each building represents 100 member institutions.

Governance

Board Composition

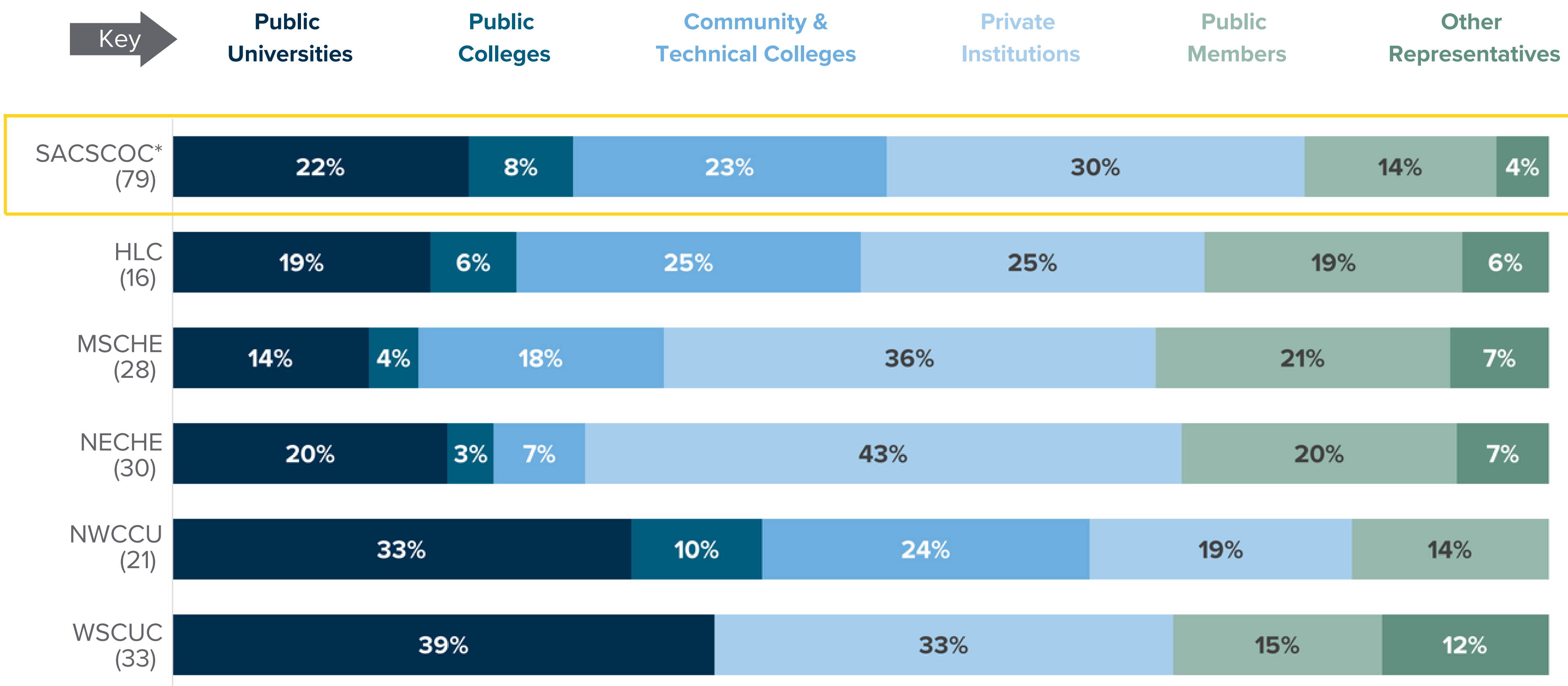
Federal Requirements for Board Membership

Accreditors

- Academic & administrative personnel
- Public representatives

Public University Representation

- WSCUC & NWCCU have the highest percentage of board representatives from public universities



*Information obtained from the SACSCOC website. According to SACSCOC Standing Rules, the board must consist of 33 individuals connected with institutions offering undergraduate & graduate programs or only graduate programs (2 from each state), 22 individuals connected with institutions offering only undergraduate programs (1 from each state), 10 academics connected or employed by a member institution in the geographical territory of SACSCOC, 1 individual representing international member institutions, & 11 individuals representing the public.

SACSCOC Delegations

- Each of the 11 states accredited by SACSCOC has a delegation of representatives on the board
- One SUS representative is a member of the Florida delegation

SACSCOC Florida Delegation

Representative	Count	Institution
Public Universities	**1**	**University of Central Florida**
Public Colleges	3	Gateway College North Florida College Northwest Florida State College
Private Institutions	2	St. Thomas University Webber International University*
Public Members	1	Florida State Senator Anitere Flores

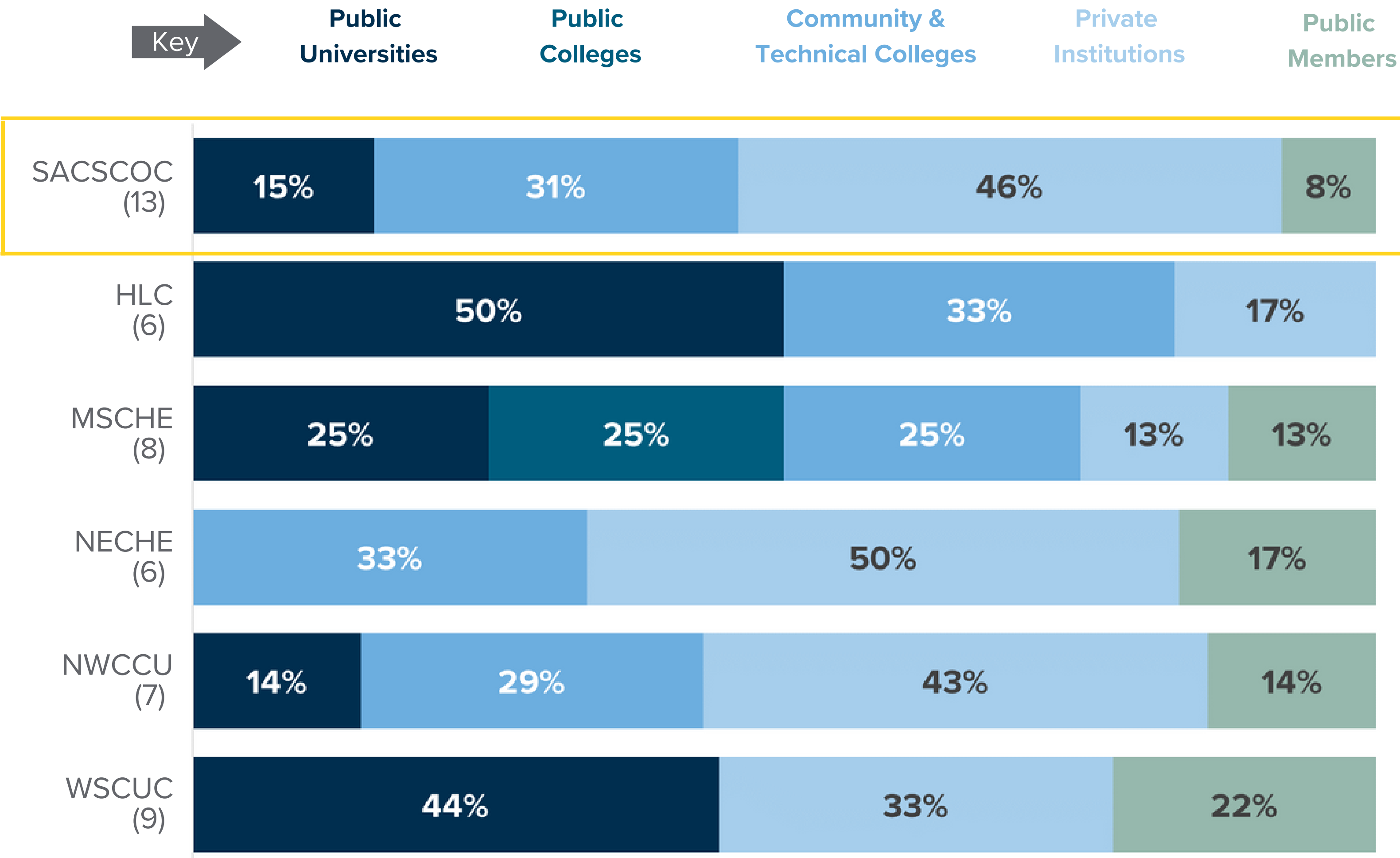
*Chair of state delegation

Governance

Executive Councils

Executive Councils of Accreditors

- Executive councils are a subset of board members that act on behalf of the board between meetings



Governance

President Selection & Powers*

Leadership Selection

- The president is selected & evaluated by either a board or the executive committee

Presidential Processes	SACSCOC	HLC	MSCHE	NECHE	NWCCU	WSCUC
Selection Body	Executive Council	Board of Trustees	Executive Committee	Executive Committee	Board of Commissioners	Nominated by Executive Committee, chosen by the Board of Commissioners
Annual Evaluation Conducted by	Executive Council	Board of Trustees	Executive Committee	Executive Committee	Board Chair	Executive Committee
Presidential Termination Authority	Unknown	Board of Trustees	Executive Committee	Executive Committee	Board of Commissioners	Unknown
Presidential Powers	• Supervise & direct management & operation of the corporation • Make all policy decisions between board meetings • Supervise employees between board meetings	• Manage activities • Employ & terminate staff • Provide leadership • Execute documents on behalf of the board that are consistent with board direction	• Day-to-day managerial responsibility • Employ & terminate staff • Execute & acknowledge contracts & other instruments on behalf of the commission	• Employ & terminate staff • Execute contracts or other instruments authorized by the Commission • Perform other duties, as necessary	• Employ & terminate staff • Manage activities • Provide leadership • Execute documents on behalf of the board	• Supervise, direct, & control affairs, property, & staff • General powers, duties, & authorities vested in the chief executive office • Manage operations consistent with financial plan or operating budget from board

*President & chief executive officer are used interchangeably.

Accreditation Standards

Key Findings

Accreditation standards for all accreditors must comply with USDOE requirements

- Standards from all six regional accreditors were reviewed
- Standards among accreditors are generally comparable
- All accreditors are focused on quality & student success; however, distinctive approaches for the review & approval of compliance may be employed by each accreditor

Review of Accreditor Standards

1. Accreditation emphasizes quality & student success

The goal of accreditation is to ensure that the education provided by institutions of higher education meets levels of quality that ultimately leads to student success. Accreditation ensures that universities are focused on providing a quality education to their students. Universities distinguish themselves by going above & beyond the accreditation standards to achieve a higher level of quality.

2. Standards are generally comparable across all accreditors with nuanced differences

All accreditors have standards relative to the following: integrity; mission; eligibility; governance; administration & organization; faculty; planning & effectiveness; student achievement; academic programs; academic & student support services; financial & physical resources; library & learning/information resources; transparency & university representation; & educational policies, procedures, & practices. However, there are some differences between each accreditor's definitions & approaches to evaluating standards which could impact university policies & processes. Universities may be challenged upholding current standards while meeting the standards of the new accreditor.

3. An in-depth collaborative review with accrediting agency staff is required

This preliminary review of standards was focused on the suitability of each accreditor for State University System universities. As each university prepares to change its accreditor, an in-depth review of each accreditor's standards & policies will need to occur. This in-depth review will be an extensive process, including ongoing consultation with the chosen accreditor & accreditation consultants.

Accreditation Process

Steps Required

Changing accreditors is a multi-step process

- State University System universities has been bound to SACSCOC since 1913
- Rules regarding institutional change of accreditors can be found in Title 34 Code of Federal Regulations, 600.11
- The Federal rule change in 2020 allows institutions to switch accreditors & increases national competitiveness among accreditors
- This change allows universities to choose an accreditor based on quality & fit

Prior to applying to a new accreditor, each university must receive approval from the USDOE

1
- University provides the following to the USDOE
  - Accreditation & preaccreditation materials
  - Reasonable cause
- University receives approval from the USDOE

2
- University applies for membership with the different accreditor while maintaining SACSCOC accreditation

3
- University receives membership from different accreditor & notifies the USDOE

4
- University must maintain SACSCOC accreditation until the USDOE provides written acknowledgment of accreditation change

Voluntary Membership

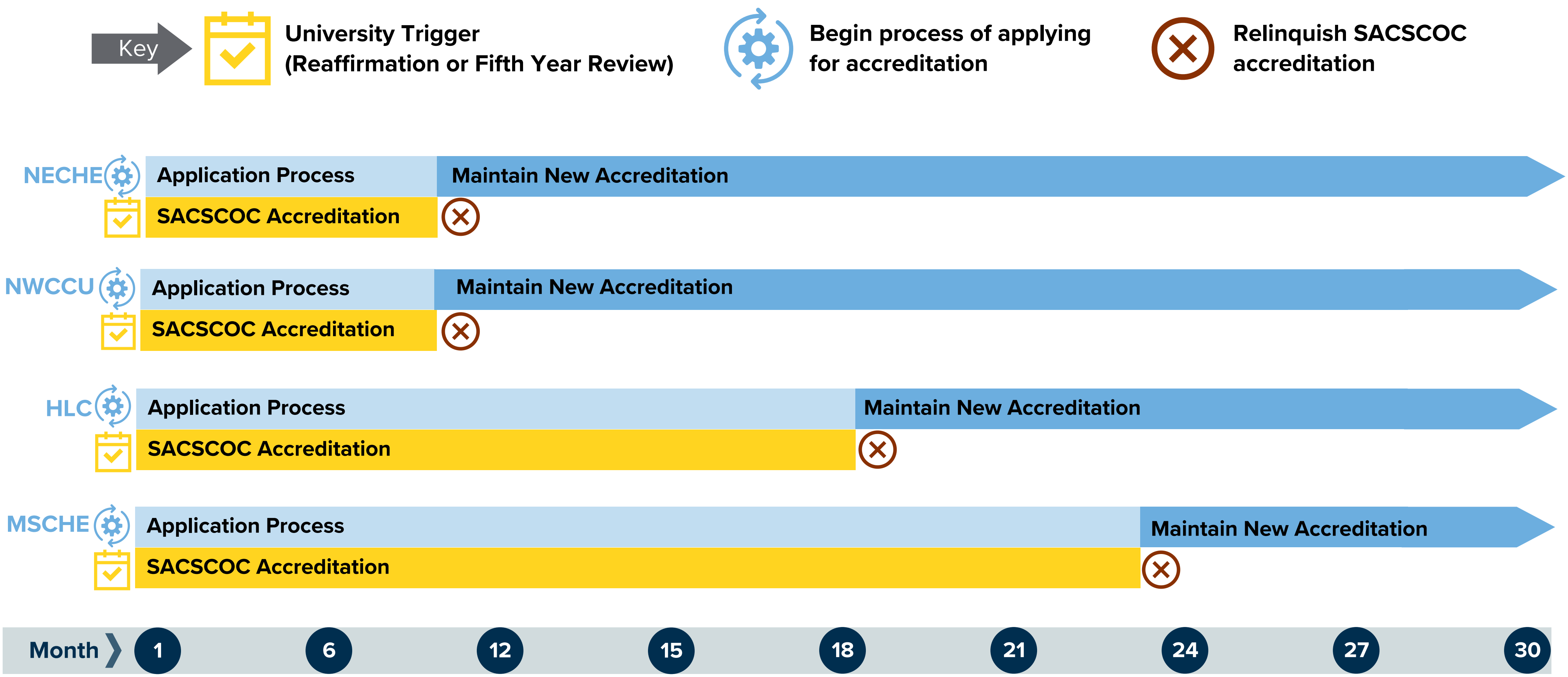
Per Code of Federal Regulations Title 34 Part 602.14, the Secretary will only recognize an accrediting agency with voluntary membership of higher education institutions

Accreditation Process

Initial Application Timeline

Universities must maintain accreditation with SACSCOC until granted accreditation with a different accreditor

	HLC	MSCHE	NECHE	NWCCU	WSCUC
Transition Timeframe*	Within 18 months	23-30 Months	8 Months	A few months-years	Not provided



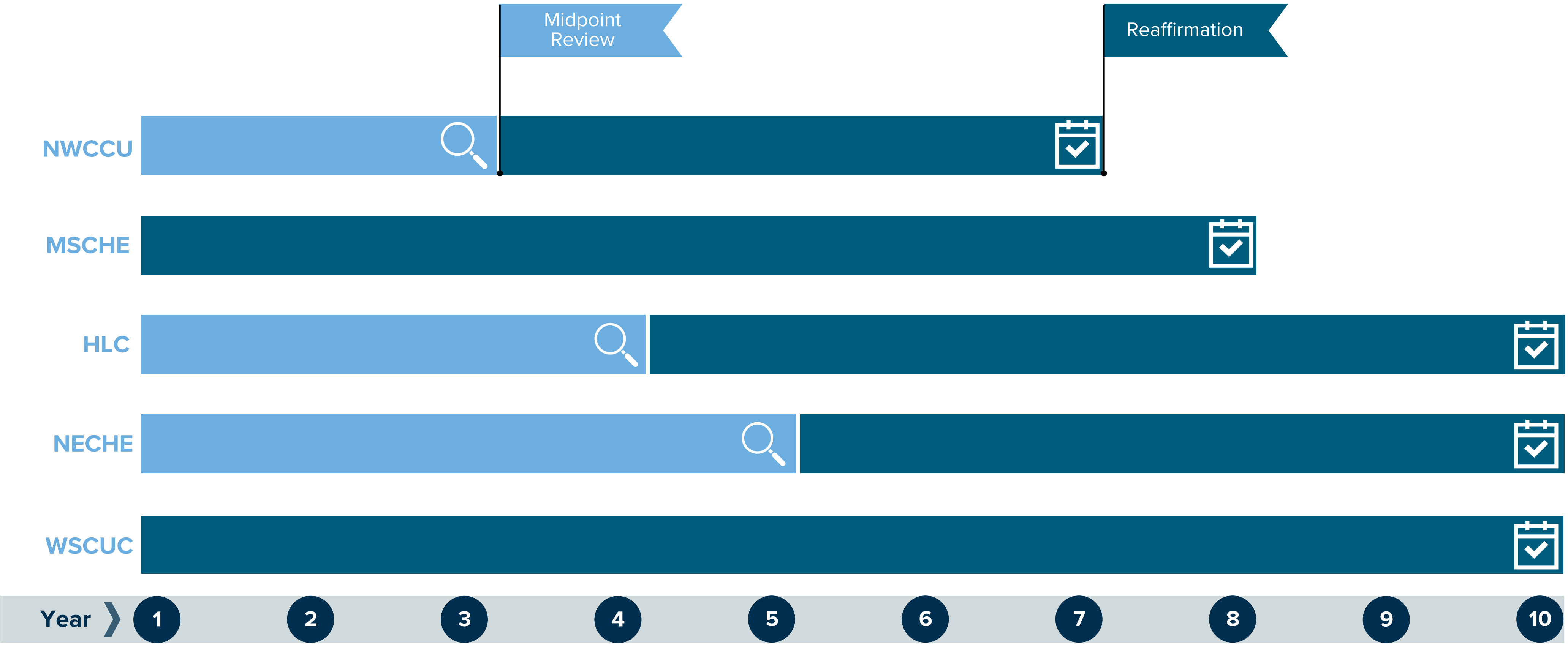
*All agencies indicated that the duration of the application process is institution specific. For WSCUC, we assume a 1.5-year application process. For NWCCU we assume a 1-year application process.

Accreditation Process

Midpoint Review & Reaffirmation Timeline

Accreditation is fundamentally iterative, timelines are approximated

	HLC	MSCHE	NECHE	NWCCU	WSCUC
Midpoint review	Year 4	Not applicable*	Year 5	Year 3	Not applicable**
Reaffirmation	Year 10	Year 8	Year 10	Year 7	Year 6, 8 or 10***



*MSCHE includes an interim report on its website, but suggested we exclude this report from our estimates as it is under review. Member institutions must undergo a self-study as part of reaffirmation. Therefore, this review is included in the cost estimates, but not the timeline overview.

**No standard interim report is required by WSCUC; however 90% of member institutions undergo some type of interim review at various points of time determined on a case-by-case basis.

***WSCUC noted that most institutions initially accredited will be put on a 6 year cycle; however, the cycle may vary based on the readiness of the institution.

Accreditation Process

Mid-point Reviews

Most accreditors include a mid-point review halfway through the course of the accreditation cycle

Reviews may include

A report

A visit

Both

	SACSCOC	HLC	MSCHE	NECHE	NWCCU	WSCUC
Institutional Report	✓	✓	✗**	✓	✓	✗****
Peer Review Visit	✓*	✗	✗	✗	✓	✗
Description	**Fifth Year Interim Report** • Institution completes a summary, compliance certification, & Quality Enhancement (QEP) Impact Report • Committee members review submitted materials & QEP	**Assurance Review** • Institution develops a report that demonstrates compliance with standards • Reviewers evaluate report	**No mid-cycle report**	**Interim (Fifth-Year) Report** • Institution develops a report that demonstrates compliance with standards & describes plans for the period before reaffirmation • Commission reviews report	**Mid-Cycle Review** • Institution develops a report that demonstrates evidence of mission fulfillment **Policies, Regulations, & Finances Review***** • Desk audit reviewing governance, resources, & capacity	**No mid-cycle report**

*SACSCOC requires a visit if institution has established five (5) or more approved off-campus instructional sites that have not hosted a visit since the last reaffirmation.
**MSCHE includes an interim report on its website, but suggested we exclude this report from our estimates as it is under review. Member institutions must undergo a self-study as part of reaffirmation. Therefore, this review is included in the cost estimates, but not the timeline overview.
***The Policies, Regulations, & Finances review by NWCCU occurs at year 6 of the accreditation process. The review is included in the above table to capture standard reviews throughout the accreditation cycle.
****No standard interim report is required by WSCUC; however 90% of member institutions undergo some type of interim review at various points of time determined on a case-by-case basis. Therefore, this review is included in the cost estimates, but not the timeline overview.

Accreditation Process

Quality Initiative Reports

While all accreditors require institutions to adhere to certain standards to ensure quality & self-reflection, SACSCOC & HLC also require institutions to demonstrate continuous improvement for specific issues or initiatives

SACSCOC: Quality Enhancement Plan

- The Quality Enhancement Plan (QEP) is part of the SACSCOC reaffirmation process whereby each institution focuses on an issue important for student learning outcomes and/or student success
- Institutions develop a document for review outlining their QEP
- Institutions develop a report describing outcomes after five years of QEP implementation

QEP examples

- "Writing Around the Curriculum" program, which is an institutional initiative focused on improving student writing skills
- "Artificial Intelligence (AI), Data, & Emotional Intelligence (EI): Critical Skills for the 21st Century," a program meant to close the gap between career readiness & employer expectations in AI, data, & EI

HLC: Quality Initiative Proposal

- Institutions designate one major improvement effort undertaken during its 10-year accreditation cycle
- Each institution submits a Quality Initiative Proposal for peer review
- At the conclusion of the quality initiative, each institution submits a report reflecting on the process

Quality Improvement Initiative Examples

- A four-year institution joins with community colleges to create a program of dual admission, joint recruitment & coordinated curriculum & student support
- The institution pursues a strategic initiative to improve its financial position

Current Annual Costs

SACSCOC Cost Overview

Accreditation costs include both university expenses & fees paid to the accreditor

- The vast majority of accreditation costs are university expenses necessary to comply with requirements (e.g., personnel, software, & consultants)
- Some university expenses & accreditation fees will likely increase during the transition to a new accreditor

Accreditation Fees

- Start-up fees
- Monitoring/Reaffirmation fees
- Annual dues

Year Over Year Average

$220K- $250K

- Over the next six years, institutions estimated they will pay $1.5 million in required fees to SACSCOC
- Most of the fees provided to SACSCOC over the next six years are associated with annual dues

University Expenses

- Personnel
- Consultants
- Software
- Reporting requirements
- Accreditation cycle
- Site visits

Year Over Year Average

$11M- $13M

- These expenses vary year-to-year based on where each university is in the accreditation process
- Expenses & workload will temporarily increase during the transition to a new accreditor

*Estimates are based on fees & university expenses reported by State University System of Florida universities.

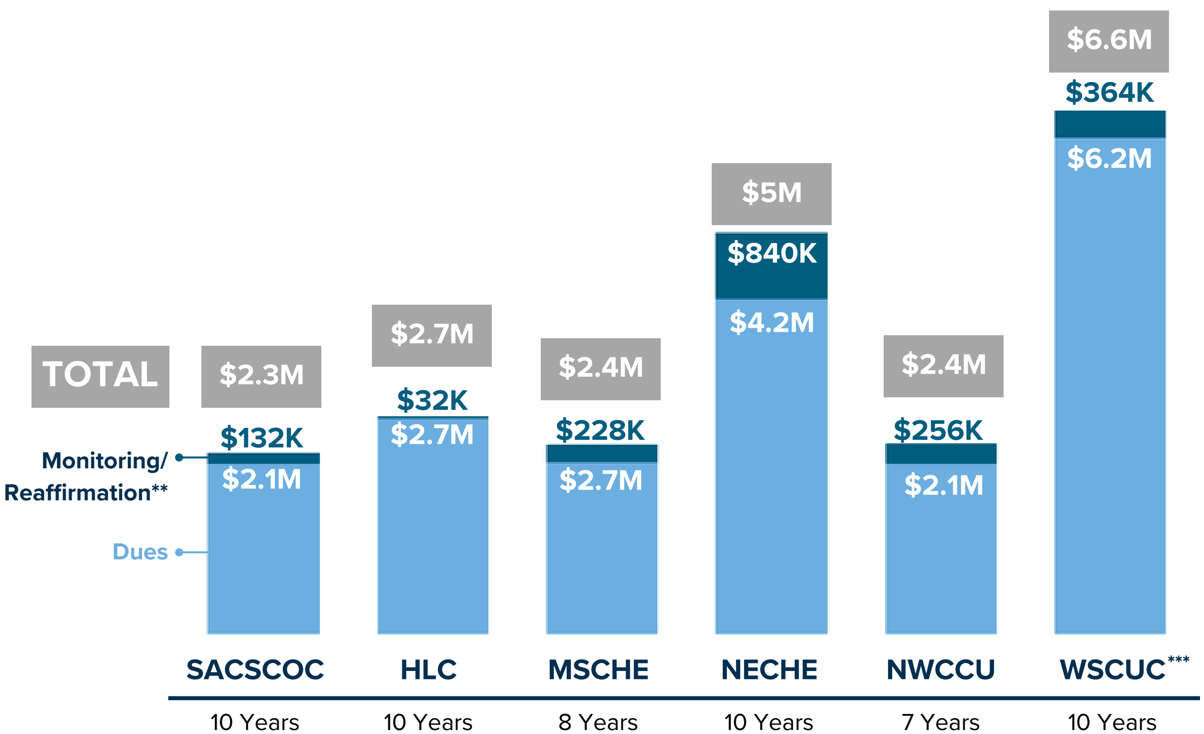
Estimated Accreditation Cycle Costs

Total Fees -- System-wide Snapshot

Cost Estimate Methodology

- Costs are specific to each institution
- Estimates provided are based on information available on each accreditor's website & were reviewed by accrediting agency staff

Accreditation Fees*



*Accreditation Cycle Length

University Expenses

Changing accreditors likely will not significantly change annual university expenses

**For more details on monitoring/reaffirmation costs, see Appendix B.

***Universities may be on a 6, 8, or 10 year cycle depending on institutional readiness.

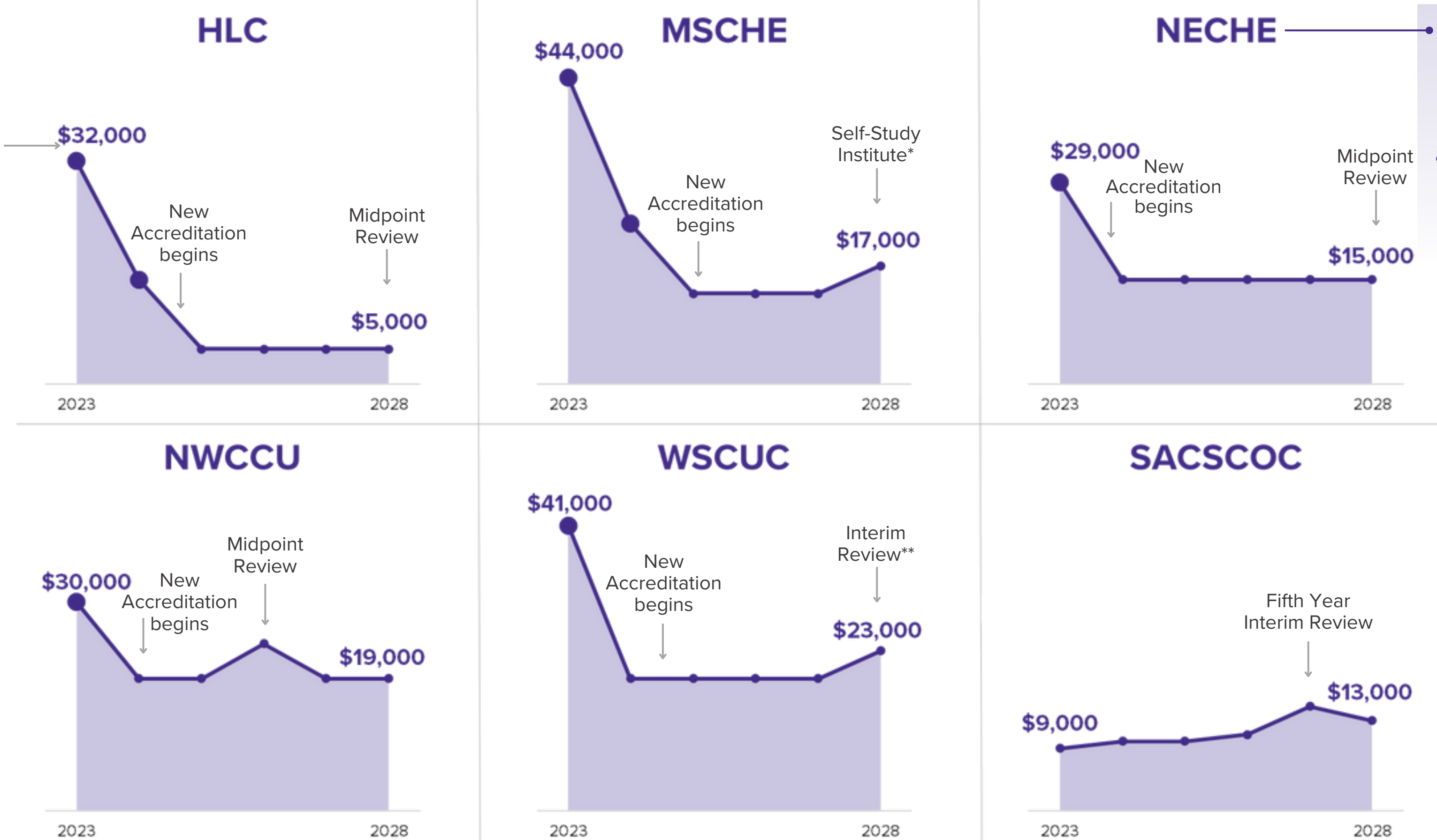
Accreditation Fees

Florida Poly Estimates

FLORIDA POLYTECHNIC UNIVERSITY

- **Once triggered in 2023, FLPOLY will pay both new accreditor application fees & any required SACSCOC fees to maintain accreditation until they are accredited by the new agency**
- **Over time, HLC fees will be the lowest followed by MSCHE**

Larger dots indicate years when a university has to pay SACSCOC fees in addition to fees charged by the new accreditor



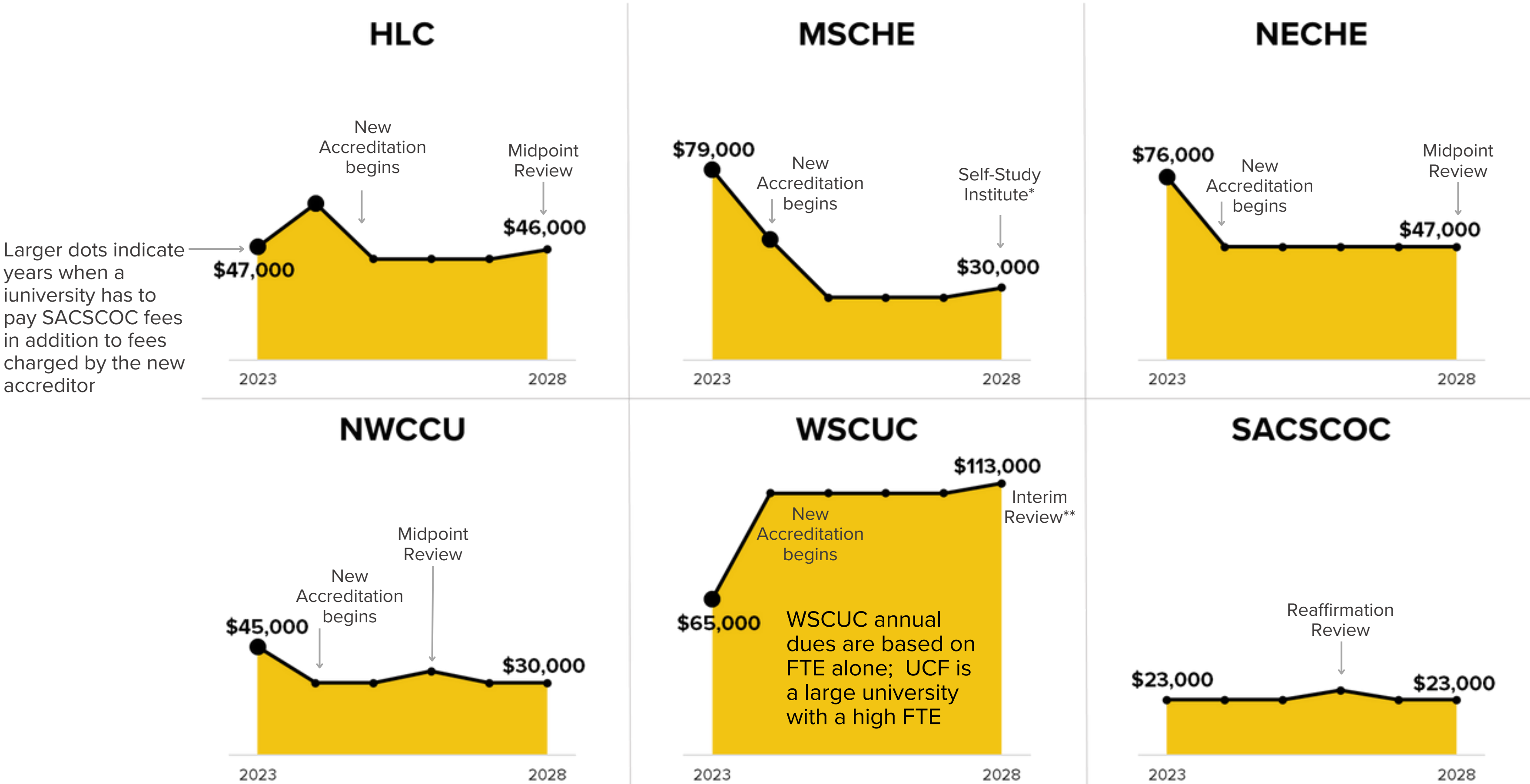
NECHE does not charge monitoring costs; however, reaffirmation costs are twice the annual dues (occurs every 10 years)

Note: The above estimates assume the application process for WSCUC will take 1.5 years & that the application process for NWCCU will take 1 year. The above estimates show accreditation fees, not university expenses. University expenses will increase during the period of time that universities are maintaining accreditation with SACSCOC & applying for new accreditation.
*MSCHE includes an interim report on its website, but suggested we exclude this report from our estimates as it is under review. Member institutions must undergo a self-study as part of reaffirmation. Therefore, this review is included in the cost estimates, but not the timeline overview.
**No standard interim report is required by WSCUC; however 90% of member institutions undergo some type of interim review at various points of time determined on a case-by-case basis. Therefore, this review is included in the cost estimates, but not the timeline overview.

Accreditation Fees

UCF Estimates

- **Once triggered in 2024, UCF will pay both new accreditor application fees & any required SACSCOC fees to maintain accreditation until they are accredited by the new agency**
- **Over time, MSCHE fees will be the lowest followed by NWCCU**



Note: The above estimates assume the application process for WSCUC will take 1.5 years & that the application process for NWCCU will take 1 year. The above estimates show accreditation fees, not university expenses. University expenses will increase during the period of time that universities are maintaining accreditation with SACSCOC & applying for new accreditation.
*MSCHE includes an interim report on its website, but suggested we exclude this report from our estimates as it is under review. Member institutions must undergo a self-study as part of reaffirmation. Therefore, this review is included in the cost estimates, but not the timeline overview.
**No standard interim report is required by WSCUC; however 90% of member institutions undergo some type of interim review at various points of time determined on a case-by-case basis. Therefore, this review is included in the cost estimates, but not the timeline overview.

Accreditation Fees

Start-Up Fees -- System-wide

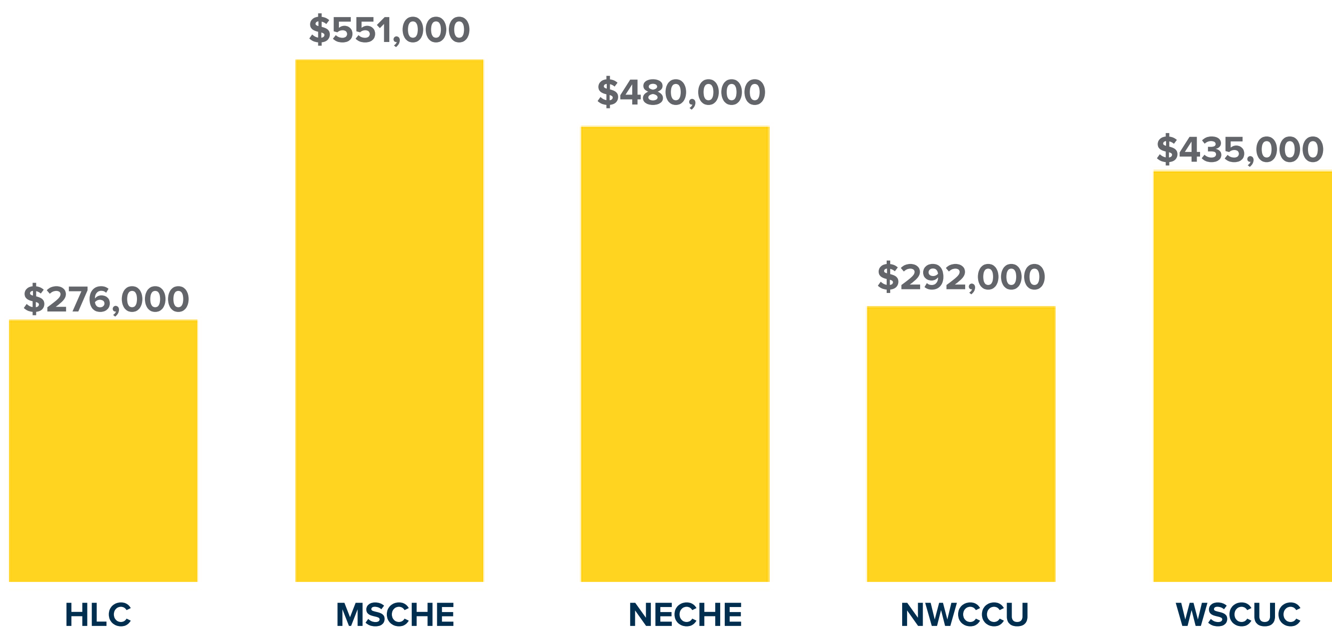
Start-Up Fees for Accreditation

- Start-up costs are non-recurring
- Overall, HLC & NWCCU offer the lowest start-up fees
- Most accreditors reduce costs for currently accredited institutions, such as those in the State University System
- Most accreditors have an accelerated pathway to accreditation for currently accredited institutions in good standing
- MSCHE is in the process of developing an accelerated pathway for currently accredited institutions

What are start-up costs?

Start-up costs include

- Application fees
- Eligibility fees
- Site visits
- Required training



	HLC	MSCHE	NECHE	NWCCU	WSCUC
Reduced Fees for Currently Accredited Institutions	✓	✗	✓	✓	✓
Accelerated Pathway for Accreditation	✓		✓	✓	✓
Cost Range Across Universities	$23,000	$35,000 - $72,000	$19,000 - $52,000	$21,000 - $31,000	$32,000 - $49,000

Accreditation Fees

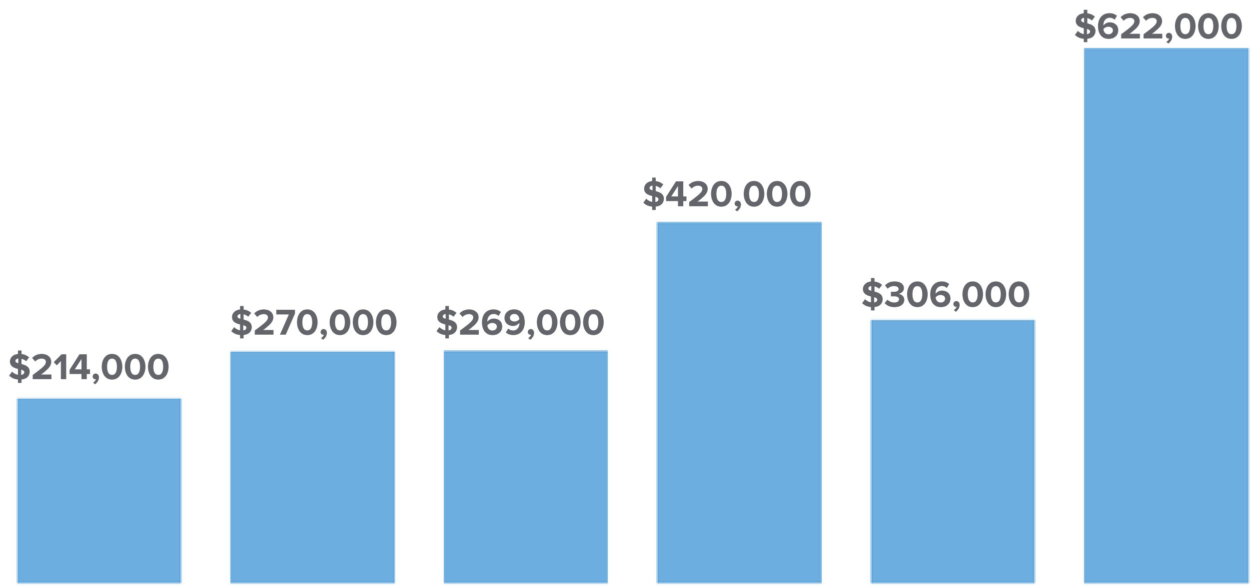
Annual Dues -- System-wide

Annual Dues for Accreditation

- The chart below shows one year of dues across all universities
- Overall, HLC & MSCHE offer the lowest annual dues
- Several accreditors use expenditure data to determine annual dues for member institutions

What are annual dues?

- Annual dues are required by all accreditors
- These dues are a recurring expense for each university
- Annual dues may include
  - Base dues
  - FTE calculation
  - Expenditure calculations
  - Campus activity fees



	SACSCOC	HLC	MSCHE	NECHE	NWCCU	WSCUC
Base Dues	✓	✓				
Expenditures	✓		✓	✓	✓	
FTE	✓	✓		✓		✓
Branch Campuses/Additional Locations		✓		✓	✓	
Cost Range Across Institutions	$9,000 - $29,000	$5,000 - $52,000	$13,000 - $44,000	$14,000 - $47,000	$19,000 - $30,000	$13,000 - $109,000

University Expenses

Additional Costs -- Site Visits

Estimates in this document consider base costs for other accreditors; however, universities will incur additional costs not included in the estimates provided

Universities cover the cost of travel, lodging, & food for evaluators during visits

Some accreditors require honoraria be paid for the evaluators' time

Number of days & number of evaluators may be reduced for special visits

Site Visits Occur During

- ✓ **Initial Accreditation**
- ✓ **Reaffirmation**
- ✓ **Some Mid-Cycle Reviews**

Site Visit Information

Cost Type	SACSCOC	HLC	MSCHE	NECHE	NWCCU	WSCUC
Evaluators for Review	8-10	5-7	7-9	7-10	3-5	5
Review Time Period	4 Days	3 Days	3 Days	3 Days	2.5 Days	3 Days
Honoraria	✓*	✓**	✓***	✗	✗	✗

Note: All estimates provided are from accreditor wesbites & conversations with accrediting agency staff

*Committee chairs receive $300 & committee members receive $150 for incidental expenses.

**Honoraria varies based on review type ranging from $125 for a Contractual Arrangement Substantive Change Review to $1,000 for a Year 4 Assurance Review. Honoraria for peer reviewers involved in comprehensive evaluations, initial accreditation visits, & reaffirmation is $700.

***Honoraria varies based on visit type ranging from $50 for team members during Self-study Evaluations & Application for Candidate Status to $800 for a Complex Substantive Change Review.

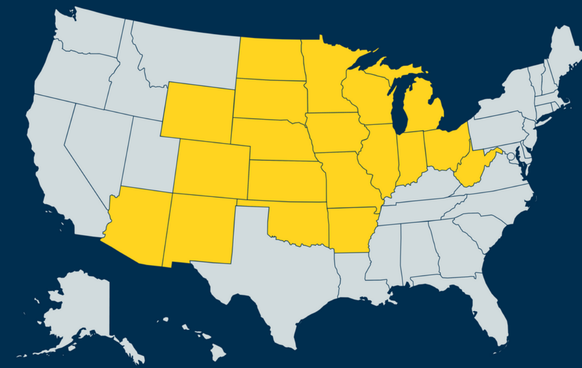
Appendices

These appendices provide additional information on the accreditors & potential costs for institutions.

Appendix A: Accreditor Information

Appendix B: Cost Estimates

Higher Learning Commission



Accreditor Highlights

Member Institutions

Public AAU Institutions: 14
U.S. News & World Report Top 100 Public Universities: 31

Board Member Composition

16 total members serving 4-year terms*

- 3 Public Universities
- 1 Public College
- 4 Community & Technical Colleges
- 4 Private Institutions
- 3 Public Members
- 1 Other Member (tribal land-grant art college)

Accreditation Processes

Accreditation Cycle: 10 years; mid-point review in year 4
Includes Accelerated Accreditation Process: Yes
Frequency Accreditor Reviews Standards: Regularly

Overview

The Higher Learning Commission (HLC) is an independent corporation founded in 1895 as one of six regional institutional accreditors in the United States. HLC accredits degree-granting post-secondary educational institutions in the United States. In its institution directory, HLC lists members in 19 states: Arizona, Arkansas, Colorado, Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, New Mexico, North Dakota, Ohio, Oklahoma, South Dakota, West Virginia, Wisconsin, & Wyoming. HLC is governed by a 16-member board of trustees elected by the membership & administered by a president selected by & accountable to that board.

Accelerated Process for Initial Accreditation

An institution may be eligible to seek accreditation with HLC through the Accelerated Process for Initial Accreditation if it meets certain requirements, including being currently accredited by a historically regional accreditor or a state entity recognized by the U.S. Department of Education. The institution must also have no history of being placed on sanction, show-cause order, or other similar negative action by its accreditor for at least the past 10 years, & must meet other requirements. The process allows the institution to apply for initial accreditation with HLC on an accelerated timeline, without serving a period of candidacy.

*Board members have the option to extend subsequent terms by two years

Higher Learning Commission (continued)

- HLC accredits the following AAU Universities

PUBLIC
- Indiana University
- Iowa State University
- Michigan State University
- Ohio State University
- Purdue University
- University of Arizona
- University of Colorado
- University of Illinois
- University of Iowa
- University of Kansas
- University of Michigan
- University of Minnesota
- University of Missouri
- University of Wisconsin

PRIVATE
- Case Western Reserve University
- Northwestern University
- University of Chicago
- Washington University-St. Louis

- HLC accredits 5 of the U.S. News & World Report Top 20 public universities
  - University of Michigan
  - University of Wisconsin
  - University of Illinois
  - Ohio State University
  - Purdue University

HLC President - Dr. Barbara Gellman-Danley

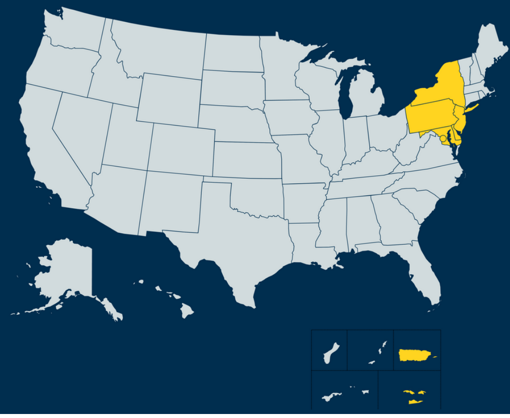
bgdanley@hlcommission.org

800-621-7440
Ext. 102

HLC Website

Main Office:
Chicago, Illinois

Middle States Commission on Higher Education



Accreditor Highlights

Member Institutions

Public AAU Institutions: 6
U.S. News & World Report Top 100 Public Universities: 19

Board Member Composition

28 total members serving 3-year terms

- 4 Public Universities
- 1 Public College
- 5 Community & Technical Colleges
- 10 Private Institutions
- 6 Public Members
- 2 Other Members (public conservatory & federal service academy)

Accreditation Processes

Accreditation Cycle: 8 years; no mid-point review
Includes Accelerated Accreditation Process: Under development
Frequency Accreditor Reviews Standards: At least once every ten years

Overview

The Mid-Atlantic Region Commission on Higher Education, doing business as the Middle States Commission on Higher Education (MSCHE), was formally incorporated under Pennsylvania Commonwealth law in 2013. MSCHE conducts accreditation activities for institutions of higher education in Delaware, the District of Columbia, Maryland, New Jersey, New York, Pennsylvania, Puerto Rico, the U.S. Virgin Islands, & any other geographic areas in which the Commission elects to conduct accrediting activities, including the evaluation of distance education & correspondence education programs offered at those institutions. MSCHE accredits institutions across the United States as well as globally.

The board (also known as the commission) consists of 28 members that conduct business in all states, except North Dakota, South Dakota, Kentucky, Puerto Rico, the U.S. Virgin Islands, & the District of Columbia.

Currently, MSCHE accredits Ana G. Mendez University (AGMU), the largest private university in Puerto Rico, which has three Florida locations in Orlando, Miami, & Tampa.

Middle States Commission on Higher Education (continued)

MSCHE accredits the following AAU Universities

PUBLIC
- Penn State University
- Rutgers University
- Stony Brook University
- University of Buffalo
- University of Maryland
- University of Pittsburgh

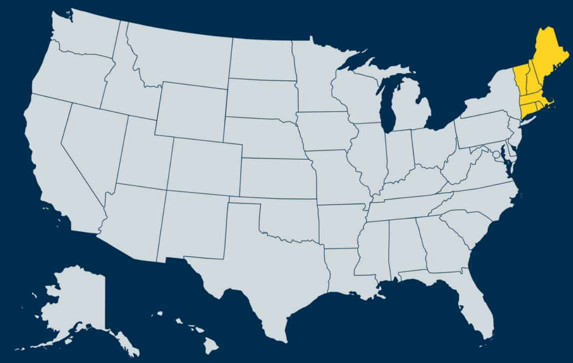
PRIVATE
- Carnegie Mellon University
- Columbia University
- Colgate University
- The John Hopkins University
- New York University
- Princeton University
- University of Pennsylvania
- University of Rochester

MSCHE accredits 2 of the U.S. News & World Report Top 20 public universities
- University of Pittsburgh
- University of Maryland

MSCHE President - Dr. Heather Perfetti

hperfetti@msche.org
267-284-5026
MSCHE Website
Main Office: Wilmington, Delaware

New England Commission on Higher Education



Accreditor Highlights

Member Institutions

Public AAU Institutions: 0
U.S. News & World Report Top 100 Public Universities: 6

Board Member Composition

30 total members serving 3-year terms

- 6 Public Universities
- 1 Public College
- 2 Community & Technical Colleges
- 13 Private Institutions
- 6 Public Members
- 2 Other Members (2 system-level members)

Accreditation Processes

Accreditation Cycle: 10 years; mid-cycle review in year 5
Includes Accelerated Accreditation Process: Yes
Frequency Accreditor Reviews Standards: Not identified

Overview

New England Commission on Higher Education (NECHE) accredits public & private community colleges, colleges, & universities. NECHE members include over 200 degree-granting postsecondary educational institutions offering higher education & located inside or outside the United States, including, but not limited to, the states of Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, & Vermont.

The board (known as the commission) comprises at least 27 persons elected by the member colleges & universities for no more than two consecutive three-year terms. At least one in seven members is a representative of the public interest, with the remainder being faculty, senior administrators, & trustees from member institutions.

New England Commission on Higher Education (continued)

- NECHE accredits the following AAU universities. ALL are private institutions

  PRIVATE

  - Boston University
  - Brandeis University
  - Brown University
  - Dartmouth College
  - Harvard University
  - Massachusetts Institute of Technology
  - Tufts University
  - Yale University

- NECHE does not accredit any of the US News & World Report Top 20 public universities

NECHE President - Dr. Lawrence Schall

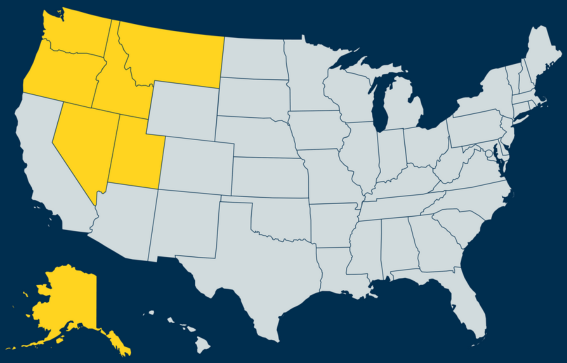
lschall@neche.org

781-425-7714

NECHE Website

Main Office: Burlington, Massachusetts

Northwest Commission on Colleges & Universities



Accreditor Highlights

Member Institutions

Public AAU Institutions: 3
U.S. News & World Report Top 100 Public Universities: 6

Board Member Composition

21 total members serving 3-year terms

- 7 Public Universities
- 2 Public College
- 5 Community & Technical Colleges
- 4 Private Institutions
- 3 Public Members
- 0 Other Member

Accreditation Processes

Accreditation Cycle: 7 years; mid-cycle review in year 3
Includes Accelerated Accreditation Process: Yes
Frequency Accreditor Reviews Standards: Once every 8 years

Overview

The Northwest Commission on Colleges & Universities (NWCCU) is a private 501(c)(3) non-profit corporation & accredits over 160 public & private institutions of higher education in Alaska, Idaho, Montana, Nevada, Oregon, Utah, Washington, & British Columbia, along with other domestic & international geographic areas.

The board (known as the commission) as a decision-making body consists of up to 26 commissioners. Commissioners are elected for staggered three-year terms & serve without compensation. A majority of the commissioners represent institutions accredited by the commission with consideration given to diversity of institutions & geographical distribution, including at least one person from the region's tribal colleges. One-seventh of the commissioners must be persons representing the general public.

Northwest Commission on Colleges & Universities (continued)

- NWCCU accredits the following AAU Universities

  PUBLIC
  - University of Oregon
  - University of Utah
  - University of Washington

- NWCCU accredits one of the U.S. News & World Report Top 20 public universities
  - University of Washington

NWCCU President - Dr. Sonny Ramaswamy

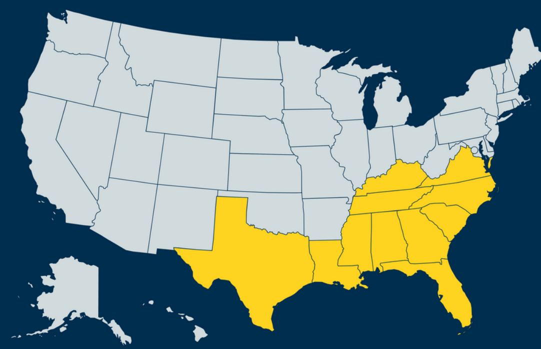
sonny@nwccu.org

425-558-4224

NWCCU Website

Main Office: Redmond, Washington

Southern Association of Colleges & Schools Commission on Colleges



Accreditor Highlights

Member Institutions

Public AAU Institutions: 6
U.S. News & World Report Top 100 Public Universities: 30

Board Member Composition

79 total members serving 3-year terms*

- 17 Public Universities
- 6 Public Colleges
- 18 Community & Technical Colleges
- 24 Private Institutions
- 11 Public Members
- 3 Other Members (Catholic seminary, research institute, Higher education commission)

Accreditation Processes

Accreditation Cycle: 10 years thereafter; mid-point review in year 5
Includes Accelerated Accreditation Process: Not identified
Frequency Accreditor Reviews Standards: Every 5 years

Overview

The Southern Association of Colleges & Schools Commission on Colleges (SACSCOC) accredits degree-granting institutions of higher education. SACSCOC serves as the regional body for accreditation in eleven southern states: Alabama, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Texas, & Virginia. SACSCOC also accredits international institutions.

SACSCOC is comprised of four primary units with representatives from each state who perform certain functions for the agency: the College Delegate Assembly, the SACSCOC Board of Trustees, the Executive Council, the Committees on Compliance & Reports, & the Appeals Committee. The Board of Trustees has 79 members elected by the College Delegate Assembly, consisting primarily of administrators & faculty from member institutions & 11 public members from outside the academe.* The Board of Trustees implements the accreditation process. The Executive Council is the executive arm of the Board of Trustees, with 13 members, including one representative from each state, a public member, & the Chair. The Executive Council is primarily responsible for interpreting commission policies & procedures.

*Information obtained from the SACSCOC website. According to SACSCOC Standing Rules, the Board must consist of 33 individuals connected with institutions offering undergraduate & graduate programs or only graduate programs (2 from each state), 22 individuals connected with institutions offering only undergraduate programs (1 from each state), 10 academics connected or employed by a member institution in the geographical territory of SACSCOC, 1 individual representing international member institutions, & 11 individuals representing the public.

Southern Association of Colleges & Schools Commission on Colleges (continued)

- SACSCOC accredits the following AAU universities

PUBLIC

- Georgia Institute of Technology
- Texas A&M University
- The University of North Carolina at Chapel Hill
- The University of Texas at Austin
- University of Florida
- University of Virginia

PRIVATE

- Duke University
- Rice University
- Tulane University
- Vanderbilt University

- SACSCOC accredits 8 of the U.S. News & World Report Top 20 public universities
  - University of Virginia
  - University of Florida
  - The University of North Carolina at Chapel Hill
  - Georgia Institute of Technology
  - The University of Texas at Austin
  - The College of William & Mary
  - University of Georgia
  - Florida State University

SACSCOC President - Dr. Belle S. Wheelan

bwheelan@sacscoc.org

(404) 679-4512

SACSCOC Website

Main Office: Decatur, Georgia

WASC Senior College & University Commission

Accreditor Highlights

Member Institutions

Public AAU Institutions: 7
U.S. News & World Report Top 100 Public Universities: 11

Board Member Composition

33 total members serving 3-year terms

- 13 Public Universities
- 0 Public College
- 0 Community & Technical Colleges
- 11 Private Institutions
- 5 Public Members
- 4 Other Members (1 member of WSCUC community & junior; 3 retired from academe)

Accreditation Processes

Accreditation Cycle: 8-10 years, interim review on case-by-case basis
Includes Accelerated Accreditation Process: Yes
Frequency Accreditor Reviews Standards: At least once every 10 years

Overview

The WASC Senior College & University Commission is a non-profit corporation that accredits over 200 public & private institutions & serves as the institutional accrediting agency for institutions that award the bachelor's or higher degrees.* A separate agency which also uses the WASC acronym, the Accrediting Commission for Community & Junior Colleges (ACCJC), accredits institutions with the main mission of offering an associate degrees. The commission's historic region has consisted of the States of California & Hawaii, the territory of Guam, American Samoa, Federated States of Micronesia, the Republic of the Marshall Islands, Republic of Palau, the Commonwealth of the Northern Marianas Islands, & other areas of the Pacific as may apply to it for service.

The board (also known as the commission) consists of 33 members serving 3-year terms. These members include institutional representatives such as presidents, provosts, deans, & faculty. In addition, the commission include public members such as educational effectiveness experts, former public officials, & people experienced in K-12 education. At large members of the commission allow for individuals who are not institutional representatives or public members to serve.

*Until 2012, the Western Association of Schools & Colleges (WASC) was a single organization with three units. In 2012, the different units separated into three separate organizations that continue to share the WASC acronym as part of their name: the Accrediting Commission for Schools, Western Association of Schools & Colleges (ACS, WASC), the Accrediting Commission for Community & Junior Colleges, Western Association of Schools & Colleges (ACCJC, WASC), & the WASC Senior College & University Commission (WSCUC). These entities now use the same "WASC" acronym but are three separate 501(c)(3) organizations with independent scopes & governance structures.

WASC Senior College & University Commission (continued)

- WSCUC accredits the following AAU Universities

PUBLIC
- University of California, Davis
- University of California, Berkeley
- University of California, Irvine
- University of California, Los Angeles
- University of California, San Diego
- University of California, Santa Barbara
- University of California, Santa Cruz

PRIVATE
- California Institute of Technology
- Stanford University
- University of Southern California

- WSCUC accredits six of the U.S. News & World Report Top 20 public universities
  - University of California, Los Angeles
  - University of California, Berkeley
  - University of California, Santa Barbara
  - University of California, San Diego
  - University of California, Irvine
  - University of California, Davis

WSCUC President - Dr. Jamienne S. Studley

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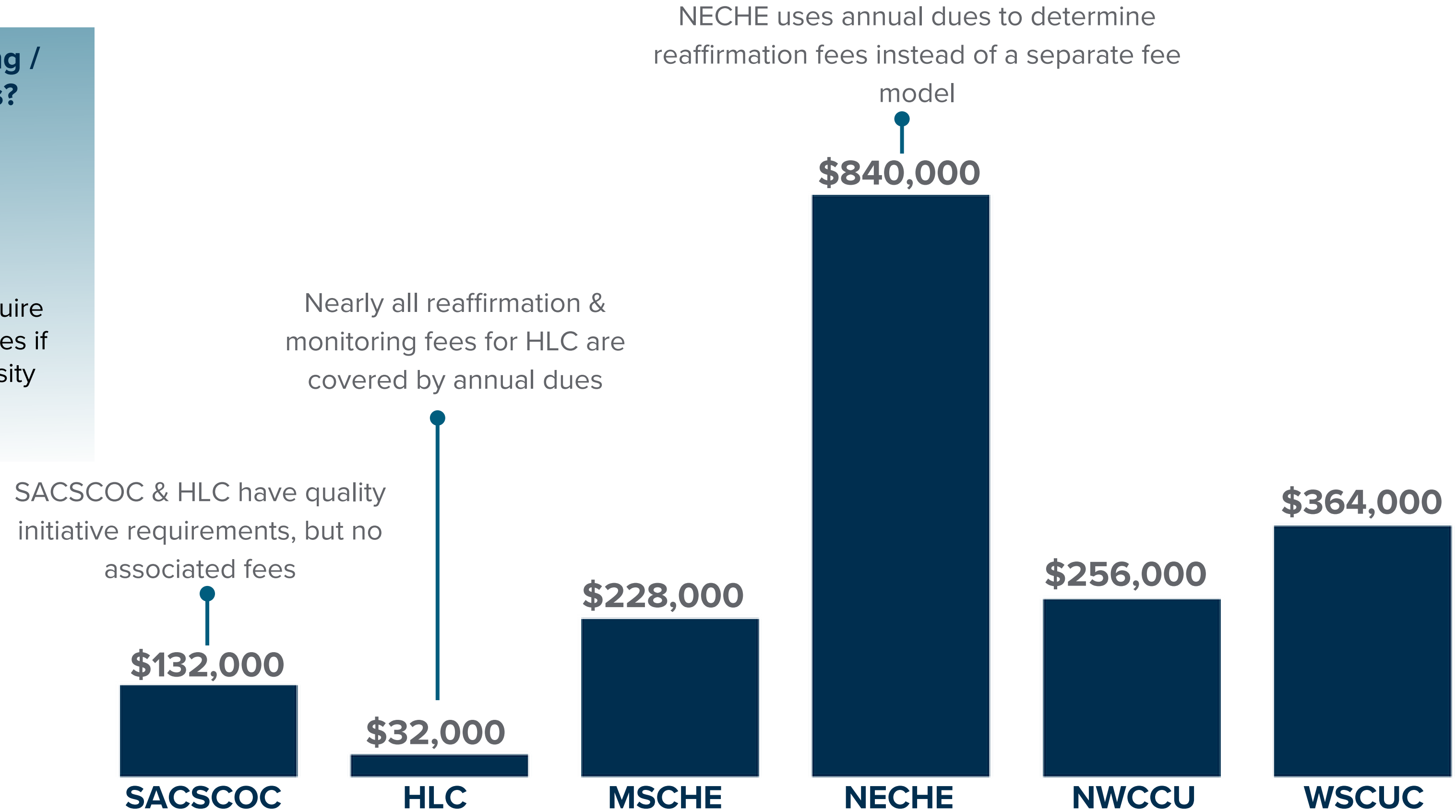
Accreditation Fees

Monitoring / Reaffirmation Fees

What are monitoring / reaffirmation fees?

- These fees include
  - Interim reports
  - Mid-cycle reviews
  - Reaffirmation fees
- All accreditors may require more visits or self-studies if issues arise at a university



	SACSCOC	HLC	MSCHE	NECHE	NWCCU	WSCUC
Mid-Cycle Review Fees	✓	✓	✗	✗	✓	✓**
Quality Project Fees	✗	✗	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Reaffirmation Fees	✓	✗	✓*	✓	✓	✓
Cost Range Across Universities	$7,000 - $20,000	$0 - $12,000	$11,000 - $49,000	$28,000 - $94,000	$18,000 - $28,000	$26,000 - $43,000

*MSCHE includes an interim report on its website, but suggested we exclude this report from our estimates as it is under review. Member institutions must undergo a self-study as part of reaffirmation. Therefore, this review is included in the cost estimates, but not the timeline overview.

**No standard interim report is required by WSCUC; however 90% of member institutions undergo some type of interim review at various points of time determined on a case-by-case basis. Therefore, this review is included in the cost estimates, but not the timeline overview.

Accreditation Cycle Fees

Total Fees -- By University

Total Accrediting Fees

- Fees shown include
  - One accreditation cycle of annual dues per university
  - One start-up cost estimate per university
  - One cycle of monitoring/reaffirmation per university

	SACSCOC* 10-Year Cycle	HLC 10-Year Cycle	MSCHE 8-Year Cycle	NECHE 10-Year Cycle	NWCCU 7-Year Cycle	WSCUC** 10-Year Cycle
FAMU	$173,000	$123,000	$199,000	$330,000	$200,000	$344,000
FAU	$214,000	$226,000	$236,000	$552,000	$221,000	$574,000
FGCU	$170,000	$153,000	$190,480	$408,000	$200,000	$437,000
FIU	$241,000	$356,000	$272,000	$590,000	$269,000	$884,000
FLPOLY	$111,000	$73,000	$150,000	$200,000	$172,000	$247,500
FSU	$243,000	$336,000	$267,000	$590,000	$269,000	$674,000
NCF	$110,000	$73,000	$150,000	$187,000	$172,000	$187,500
UCF	$251,000	$447,000	$282,000	$616,000	$249,000	$1,168,000
UF	$314,000	$555,000	$473,000	$616,000	$269,000	$832,000
UNF	$175,000	$163,000	$199,000	$433,000	$200,000	$444,000
USF	$264,000	$367,000	$304,000	$616,000	$269,000	$812,000
UWF	$162,000	$136,000	$209,000	$382,000	$200,000	$414,000
Total	$502,000	$578,000	$1,048,480	$1,740,000	$854,000	$1,420,000

*SACSCOC estimates include $156,000 in approximated start-up fees for comparison purposes. However, SUS universities are current members and would not pay start-up fees.

**WSCUC noted that most institutions initially accredited will be put on a 6 year cycle; however, the cycle may vary based on the readiness of the institution.

Accreditation Fees

Start-Up Fees -- By University

Start-Up Fees for Accreditation*

- Start-up fees vary and can include
  - Application fees
  - Eligibility fees
  - Site visits
  - Required training

	SACSCOC	HLC	MSCHE	NECHE	NWCCU	WSCUC
FAMU	$13,000	$23,000	$39,000	$30,000	$21,000	$35,000
FAU	$13,000	$23,000	$45,000	$47,000	$21,000	$35,000
FGCU	$13,000	$23,000	$35,000	$36,000	$21,000	$31,500
FIU	$13,000	$23,000	$51,000	$50,000	$31,000	$35,000
FLPOLY	$13,000	$23,000	$35,000	$20,000	$21,000	$31,500
FSU	$13,000	$23,000	$41,000	$50,000	$31,000	$35,000
NCF	$13,000	$23,000	$35,000	$19,000	$21,000	$31,500
UCF	$13,000	$23,000	$56,000	$52,000	$21,000	$42,000
UF	$13,000	$23,000	$72,000	$52,000	$31,000	$49,000
UNF	$13,000	$23,000	$39,000	$38,000	$21,000	$35,000
USF	$13,000	$23,000	$57,000	$52,000	$31,000	$39,000
UWF	$13,000	$23,000	$46,000	$34,000	$21,000	$35,000
Total	**$156,000**	**$276,000**	**$551,000**	**$480,000**	**$292,000**	**$434,500**

**SACSOC start-up estimates are excluded because are SUS current members and would not pay start-up fees.

Accreditation Fees

One-Year Annual Dues -- By University

Annual Fees for Accreditation

- Estimates show one year of dues based on current universities' FTE, expenditures, & number of campuses/sites

	SACSCOC	HLC	MSCHE	NECHE	NWCCU	WSCUC
FAMU	$14,000	$10,000	$18,000	$25,000	$23,000	$28,000
FAU	$18,000	$20,000	$22,000	$42,000	$26,000	$51,000
FGCU	$15,000	$13,000	$18,000	$31,000	$23,000	$38,000
FIU	$22,000	$33,000	$25,000	$45,000	$30,000	$82,000
FLPOLY	$9,000	$5,000	$13,000	$15,000	$19,000	$19,000
FSU	$22,000	$31,000	$26,000	$45,000	$30,000	$61,000
NCF	$9,000	$5,000	$13,000	$14,000	$19,000	$13,000
UCF	$23,000	$42,000	$26,000	$47,000	$30,000	$109,000
UF	$29,000	$52,000	$44,000	$47,000	$30,000	$74,000
UNF	$15,000	$14,000	$18,000	$33,000	$23,000	$38,000
USF	$24,000	$34,000	$28,000	$47,000	$30,000	$74,000
UWF	$14,000	$11,000	$18,000	$29,000	$23,000	$35,000
Total	$214,000	$270,000	$269,000	$420,000	$306,000	$622,000

Accreditation Fees

Monitoring / Reaffirmation Costs -- By University

Monitoring / Reaffirmation Costs

- These fees include
  - Interim reports
  - Mid-cycle reviews
  - Reaffirmation fees
- All accreditors may require more visits or self-studies if issues arise at an institution

	SACSCOC	HLC	MSCHE	NECHE	NWCCU	WSCUC
FAMU	$20,000	$0	$16,000	$50,000	$18,000	$29,000
FAU	$21,000	$3,000	$15,000	$85,000	$18,000	$29,000
FGCU	$7,000	$0	$11,480	$62,000	$18,000	$25,500
FIU	$8,000	$3,000	$21,000	$90,000	$28,000	$29,000
FLPOLY	$8,000	$0	$11,000	$30,000	$18,000	$26,000
FSU	$10,000	$3,000	$18,000	$90,000	$28,000	$29,000
NCF	$7,000	$0	$11,000	$28,000	$18,000	$26,000
UCF	$8,000	$4,000	$18,000	$94,000	$18,000	$36,000
UF	$11,000	$12,000	$49,000	$94,000	$28,000	$43,000
UNF	$12,000	$0	$16,000	$65,000	$18,000	$29,000
USF	$11,000	$4,000	$23,000	$94,000	$28,000	$33,000
UWF	$9,000	$3,000	$19,000	$58,000	$18,000	$29,000
Total	**$132,000**	**$32,000**	**$228,480**	**$840,000**	**$256,000**	**$363,500**

Higher Learning Commission

PROCEDURE

Accelerated Process for Initial Accreditation
Process Overview

BASIC INFORMATION

In July 2019, following a period of negotiated rule-making, the U.S. Department of Education (USDE) issued new regulations that removed the notion of "geographic scope" from accrediting agencies' scope of recognition. This change allowed for historically regional accreditors, such as the Higher Learning Commission (HLC), to choose to expand their individual jurisdictions to operate on a larger geographic scale.

Following the changes in federal regulations, the HLC Board of Trustees redefined HLC's jurisdiction for accrediting institutions of higher education as those that are incorporated in, or operating under federal authority in, the United States and that have a substantial presence, as defined in HLC policy, in the United States.

Relatedly, HLC's Board approved changes to its policies to allow for an accelerated process for achieving accreditation for institutions with a proven history of quality assurance from a historically regional accreditor or a state entity that is recognized by the USDE as an institutional accreditor of degree-granting institutions of higher education.

The Accelerated Process for Initial Accreditation features a reduced timeline to achieving accreditation while still assuring rigor and protection for student success. The process is only available to institutions that meet certain qualifications prior to and throughout the process. This includes being currently accredited by a historically regional accreditor or a state entity recognized by the USDE as an institutional accreditor, and being in good standing with that accreditor. Institutions that do not meet the qualifications for the Accelerated Process for Initial Accreditation may pursue accreditation through HLC's traditional Eligibility Process.

An institution undertaking the Accelerated Process for Initial Accreditation must complete all of the steps in the process within the time frames prescribed; must adhere to HLC guidelines related to each step, including guidelines related to the submission of documents; and must receive a positive decision by HLC before moving to each next step.

Institutions participating in the Accelerated Process for Initial Accreditation do not hold any status with HLC until awarded initial accreditation. An institution may not make any public statement about seeking status until just prior to the comprehensive evaluation visit for initial accreditation is scheduled.

During the process, the institution must not undertake any significant changes that would alter the information as described in the application.

Significant changes could include, but are not limited to: changes in mission, ownership or governance; the implementation of new programs that represent significant departures from the institution's current program inventory; new delivery methods requiring substantial planning and implementation; new contractual or consortial relationships; or the initiation of additional locations or branch campuses. Significant change may result in cancellation of any scheduled aspect of the process and may require that the institution restart the accelerated process for initial accreditation.

Fees apply at a number of steps throughout the Accelerated Process for Initial Accreditation. A complete list of these fees can be found in the current HLC Dues and Fees Schedule. Where applicable, fees must accompany the submission of materials or are due at the start of a step in the process. An institution will not be permitted to proceed in the process until the required fees are received.

If at any point in the process the institution misses a required deadline, voluntarily withdraws from the process, or fails to achieve the next step in the process, the institution must start from the beginning of the Accelerated Process for Initial Accreditation. As detailed in HLC policy, an institution that completes the process but is denied initial accreditation by the HLC Board of Trustees may reapply to participate in the accelerated process after taking steps to remedy the circumstances that led to the denial of initial accreditation, or may elect to pursue membership through HLC's traditional Eligibility Process. The institution must generally wait one year before pursuing either process, unless the HLC Board has provided otherwise.

At various steps in the process, the institution will be asked to provide an institutional response to recommendations, as provided in HLC policy. Additionally, certain determinations within the process are subject to appeal, as provided in HLC policy.

As applicable, the institution maintains responsibility for keeping entities such as state higher education agencies, USDE and, if applicable, other accreditors informed throughout the process.

The content in this document is supplemental to HLC policy. Institutions should familiarize themselves with applicable HLC policies as they proceed through the process (see page 11 for a list of related policies).

Institutions should also familiarize themselves with the HLC Glossary. HLC will maintain all documents submitted by institutions in accordance with applicable HLC policies.

QUESTIONS

Questions about the process may be directed to seekingaccreditation@hlcommission.org. Institutions are encouraged to attend applicable programming, for example at HLC's annual conference, before beginning the Accelerated Process for Initial Accreditation.

ACCELERATED PROCESS FOR INITIAL ACCREDITATION: AT A GLANCE

The following chart summarizes the three main steps involved in the Accelerated Process for Initial Accreditation. Additional information regarding each of the tasks immediately follows the chart.

STEP AND ASSOCIATED ACTIVITIES	TIME FRAME
1. Application An institution begins the accelerated process for initial accreditation by submitting an application along with required Accelerated Process Application Evidence to demonstrate that it meets the qualifications for the process and that it meets other specific HLC requirements. HLC staff assess the institution's application to determine whether the institution meets the qualifications for the Accelerated Process for Initial Accreditation and whether it can demonstrate that it has certain essential characteristics that would make it eligible for HLC membership. This includes the opportunity for interaction with HLC staff through a combination of email, phone, or video-enabled conversations as needed. This step culminates in a decision regarding whether the institution may proceed to the preliminary peer review.	HLC staff will review the application and respond to the institution, typically within one month.
2. Preliminary Peer Review The preliminary peer review includes the following components: • Abbreviated Assurance Filing demonstrating that the institution has provided sufficient narrative and evidence regarding each of HLC's Criteria for Accreditation to proceed • Institutional Data Form • Compliance With Eligibility Requirements Form • Compliance With Assumed Practices Form Peer reviewers preliminarily evaluate the narrative and evidence provided by the institution. There is no in-person visit or other interaction between the institution and peer reviewers. This step culminates in a decision regarding whether the institution may proceed to a comprehensive evaluation for initial accreditation. If the institution continues, it is assigned an HLC staff liaison at the conclusion of this step.	HLC anticipates that institutions will prepare and submit the required narrative and evidence within approximately three months following HLC's response to the institution's application (step 1). Institutions must submit these materials within no more than one year following HLC's response to the institution's application. Upon submission of materials required for the preliminary peer review, the peer review panel takes approximately one month to evaluate the materials and determine the institution's ability to continue with the process.

STEP AND ASSOCIATED ACTIVITIES	TIME FRAME
3. Comprehensive Evaluation for Initial Accreditation The institution submits its comprehensive evaluation materials and hosts an on-site visit by a peer review team. The evaluation includes the following components: • Full Assurance Filing demonstrating the institution's compliance with the Criteria for Accreditation and all Core Components • Institutional Data Form • Compliance With Eligibility Requirements Form • Compliance With Assumed Practices Form • Federal Compliance Filing • On-site visit, including if applicable, a Multi-Campus Visit • Student Opinion Survey • Institutional Actions Council (IAC) Hearing • HLC Board decision	Institutions should prepare for a comprehensive evaluation within approximately nine months after being informed by HLC that the institution may do so and must undergo the comprehensive evaluation within no more than one year from that time. Visit timing will be coordinated with the institution to proceed on as accelerated a timeline as the institution desires, and as is practical, inclusive of the timing for the necessary IAC Hearing and Board meeting where the Board will consider the institution for initial accreditation.

1. APPLICATION

The Accelerated Process for Initial Accreditation begins with an institution submitting an application and providing the required application fee. An institution's application will not be considered complete until the application fee is received. For institutions successful in proceeding through the preliminary peer review, this fee will be credited toward the institution's fee for the comprehensive evaluation for initial accreditation. See HLC's Dues and Fees Schedule and the payment information on page 8 of this document for more information.

Accelerated Process Application Evidence

The institution's application will include documentation demonstrating that the institution meets the qualifications to participate in the accelerated process, as well as other specific HLC requirements. The Accelerated Process Application Evidence must be submitted through the application form as a single PDF file labeled with the file name: (name of institution) ApplicationEvidence.pdf. It should include the following:

1. All official communications between the institution and its current accreditor for the previous 12 months. This includes, but is not limited to: action letters, other official correspondence, reports submitted by the institution, evaluations and other analyses from the accreditor, etc.
2. To the extent not already provided in item 1, documentation showing that the institution, in its current form, is currently institutionally accredited by an accrediting agency that is recognized by the USDE and that is historically known as a regional accreditor, or by a state entity that is recognized by the USDE as an institutional accreditor of degree-granting institutions of higher education.
3. To the extent not already provided in item 1, documentation showing that the institution, in its current form, (a) has been accredited by its current institutional accreditor for at least the past 10 years or (b) has undergone a reaffirmation of accreditation review with its current institutional accreditor in the past two years that did not result in a sanction or other similar negative action.
4. To the extent not already provided in item 1, documentation showing that the institution, in its

current form, has not been placed on a sanction, show-cause order, or other similar negative action with its current institutional accreditor for at least the past 10 years.

5. Documentation from Federal Student Aid indicating that the institution has demonstrated reasonable cause for changing its primary accrediting agency or for maintaining accreditation by multiple agencies and has the approval of FSA under federal regulations to seek accreditation with HLC.
6. A description explaining how the institution's decision to change its primary accrediting agency or for maintain accreditation by multiple agencies is voluntary. Information to be included as part of this explanation could include, but is not limited to, the institution's rationale for seeking accreditation with HLC, an analysis of any external factors that are affecting the institution's decision to seek accreditation with HLC, and a description of the institution's decision-making process for choosing to seek accreditation with HLC.
7. Completed Substantial Presence Worksheet.
8. Documentation showing the incorporation of the institution within HLC's jurisdiction in accordance with HLC policy.
9. Documentation showing legal status to operate as an institution offering higher learning in at least one state, sovereign nation or jurisdiction within HLC's jurisdiction in accordance with HLC policy and, if applicable, evidence of state authorization in good standing to offer higher learning in any other location in which it is required by state law or regulation to be authorized. Disclosure of any state action to suspend, limit or terminate the corporate status or higher education authorization of the institution or any related entity within the previous five years.
10. List of all degree and certificate programs offered, including noting which programs are offered by distance or correspondence education.
11. Information about specific current enrollments in all degree and certificate programs shown by program, location and mode of delivery.
12. Letter from the institution's governing board confirming its intention to seek accreditation with HLC and a copy of the minutes from the Board meeting in which the Board approved seeking accreditation. The institution must make clear whether it is seeking system accreditation for a multi-corporate structure involving multiple institutions or seeking accreditation for a single corporate structure involving only one institution. HLC will make the final decision on whether the requested scope of accreditation is appropriate.
13. List of other current accreditation relationships, including status, and information regarding any other official interactions with other accreditors in the past five years.

After the institution submits the application and the application fee, HLC staff evaluate the institution's application and evidence to determine whether the institution meets the qualifications for the accelerated process and can demonstrate that it has certain essential characteristics that would make it eligible for HLC membership, as noted in HLC policy. Throughout this period, the institution has access to HLC staff for consultation through a combination of email, phone or video-enabled conversations as needed.

This step concludes with a decision on whether or not the institution may move to the next step, preliminary peer review. This decision is final.

2. PRELIMINARY PEER REVIEW

HLC anticipates that institutions will prepare and submit the required narrative and evidence for the preliminary peer review within approximately three months following HLC's response to the institution's application (step 1). An institution must submit these materials within no more than one year following HLC's response to the institution's application.

During the preliminary peer review, the institution is provided a site in HLC's online Assurance System, which is where the institution will provide:

- Institutional Data Form
- Compliance With Eligibility Requirements Form
- Compliance With Assumed Practices Form
- Assurance Argument with narrative focused only at the Criteria "summary" level (not the Core Component level, which occurs later) and evidentiary documents linked to the narrative for the Criteria

Details on submission requirements for the preliminary peer review can be found in the Required Materials and Submission Procedures on page 7.

A peer review panel evaluates the narrative and evidence provided by the institution. There is no in-person visit or other interaction among the institution and peer reviewers at this step. A fee applies at the beginning of this step; see HLC's Dues and Fees Schedule for more information.

Once the institution has submitted the materials required for the preliminary peer review, the peer review panel takes approximately four weeks to evaluate the materials and determine the institution's ability to continue with the process.

The preliminary peer review is focused on whether there is sufficient evidence such that the institution appears likely to meet HLC requirements and is sufficiently prepared to host a comprehensive evaluation for initial accreditation. In some cases, peer reviewers may request additional information for relatively small issues or when an obviously missing item of information is needed.

The preliminary peer review concludes with a determination that either (1) authorizes the institution to move to the comprehensive evaluation for initial accreditation; or (2) indicates that the institution may not move forward with the accelerated process for initial accreditation. This is a final decision.

If the institution proceeds with the accelerated process for initial accreditation, HLC will assign the institution an HLC staff liaison at the conclusion of this step. The staff liaison serves as the primary contact for the institution henceforward and as a resource regarding HLC policies and procedures. In addition, the staff liaison also assists the institution through various logistical aspects of reviews, HLC's decision-making process and other HLC processes.

If it is determined that the institution may not move forward with the accelerated process, the institution may choose to proceed by initiating HLC's traditional Eligibility Process.

3. COMPREHENSIVE EVALUATION FOR INITIAL ACCREDITATION

Institutions should prepare for and undergo a comprehensive evaluation within approximately nine months after being informed by HLC that the institution may do so, and must undergo the comprehensive evaluation within no more than one year from that time. Timing for the on-site evaluation will be coordinated with the institution to proceed on as accelerated a timeline as the institution desires, and as is practical, inclusive of the timing for the necessary IAC Hearing and the Board meeting where the Board will consider the institution for initial accreditation.

In a comprehensive evaluation for initial accreditation, an institution must demonstrate evidence that it meets all of the Criteria for Accreditation, including all Core Components. An institution must also demonstrate evidence that it meets the Eligibility Requirements, Assumed Practices and Federal Compliance Requirements. Initial accreditation is achieved through submission of comprehensive evaluation materials, participating in HLC's Student Opinion Survey process, hosting an on-site evaluation by a peer review team to the institution's main campus and, if applicable, a selection of its branch campuses, participating in a hearing by the IAC and action by the HLC Board of Trustees. Each of these steps of the process is conducted in accordance with HLC policy. Regular fees, for example those related to comprehensive evaluations, apply throughout this step. See HLC's HLC Dues and Fees Schedule for more information.

During the comprehensive evaluation for initial accreditation, the institution will provide:

- Institutional Data Form
- Compliance With Eligibility Requirements Form
- Compliance With Assumed Practices Form
- Assurance Argument with narrative focused at Core Component level, and evidentiary documents linked to the narrative
- Federal Compliance Filing
- Multi-Campus Visit Report (if applicable)

Details on submission requirements for the comprehensive evaluation for initial accreditation can be found in the Required Materials and Submission Procedures on this page. Additional information about the comprehensive evaluation process is available on HLC's website.

Once the comprehensive evaluation for initial accreditation is scheduled, the institution may make public that it is seeking status with HLC. The institution must use HLC's prescribed language in making this announcement:

> *(Name of institution) currently holds no status with the Higher Learning Commission. (Name of institution) has initiated the process of seeking accreditation with the Higher Learning Commission. HLC will conduct a comprehensive evaluation on (date) to determine whether (name of institution) should be awarded initial accreditation. The team's recommendation is subject to additional levels of HLC review and decision-making. Therefore, no further information will be provided until HLC's Board of Trustees makes a final decision on the award of initial accreditation.*

After the comprehensive evaluation, the peer review team's report and recommendation, along with the entire record, will be routed through HLC's decision-making process. This includes review by an IAC Hearing, where team and institutional representatives participate, and action by HLC's Board. As provided in HLC policy, the institution is afforded the opportunity to submit an institutional response following both the team report and the IAC Hearing.

Institutions participating in the Accelerated Process for Initial Accreditation must meet all HLC requirements in order to be granted initial accreditation; this may include findings of "met" or "met with concerns" with respect to the Criteria for Accreditation.

If the Board grants initial accreditation, the institution becomes accredited by HLC. Such accreditation may, in the Board's discretion, be subject to interim monitoring, restrictions on institutional growth or substantive change, or other contingencies.

If the Board denies initial accreditation, the institution may reapply to participate in the accelerated process after taking steps to remedy the circumstances that led to the denial of initial accreditation, or may elect to pursue membership through HLC's traditional Eligibility Process. The institution must generally wait one year before pursuing either process, unless the Board has provided otherwise. Denial of accreditation by the Board is an adverse action that is subject to appeal as detailed in HLC's policies.

REQUIRED MATERIALS & SUBMISSION PROCEDURES

GENERAL REQUIREMENTS AND INFORMATION

- Except for the Assurance Argument and associated evidence file materials, HLC requires that all institutional materials be submitted electronically as PDF documents. Ensure that electronic documents are paginated, bookmarked and searchable with internal document links that allow for ease of movement across chapters, sections and subsections. Do not scan printed documents to create a PDF document, as this will result in a document that is large in file size and not text searchable. Electronic documents should be prepared by an individual with expertise in using appropriate PDF software, such as Adobe Acrobat.
- Include internal document organizational strategies (such as headings or lists of linked documents) that make it easy for the reader to navigate within the electronic document.
- Unless instructed otherwise, avoid links to websites or other materials. Links to external materials should offer only supplemental information. **Reviewers are not required to pursue external links.**
- Only use graphics and pictures if they provide specific evidence. Optimize graphics and pictures to reduce the size of the document.
- Ensure that software settings are set to create clear text and graphics, yet not make the file size too large.
- Please review HLC's guidelines regarding personally identifiable information (PII) prior to submitting any materials to HLC.
- Submit only the requested documents. If documents are applicable to more than one item

in a filing, submit them once and cross-reference appropriately.

- Do not apply password protection to PDF documents.
- It is the institution's responsibility to ensure that HLC has those documents necessary to provide a complete and accurate understanding of the institution's compliance with HLC's requirements. If the institution has relevant information that has not been specifically requested, it should contact HLC staff for instructions about the appropriateness of submitting the information.
- Documents will be submitted via HLC's website, a file-sharing link or through the Assurance System. Do not send any documents by email to HLC.
- The application fee should be submitted as detailed below. HLC will issue invoices for all other payments. Contact finance@hlcommission.org or 312.881.8119 for instructions on submitting a wire/ACH payment or with other financial inquiries.

  The application fee may be submitted by wire/ACH or mailed to HLC's office:

  Higher Learning Commission
  230 South LaSalle Street, Suite 7-500
  Chicago, IL 60604-1411

General Notes On The Assurance System

HLC's online Assurance System allows institutions to assemble an Assurance Filing and provide any other required forms and materials. The Assurance Filing includes a narrative (Assurance Argument) and supporting evidentiary documents (Evidence File) in a framework built around the Criteria for Accreditation. Institutions use this system to demonstrate their compliance with the Criteria for Accreditation and other HLC requirements. Narrative in the Assurance System should be evaluative in nature and substantiated with clear, specific evidence (versus general references to documents that may contain evidence).

Extensive training is available on HLC's website about using the Assurance System effectively, and HLC staff are available to assist institutions.

All materials for the preliminary peer review and the comprehensive evaluation for initial accreditation are submitted through the Assurance System. All materials must be submitted to the Assurance System before the institution's lock date. For the preliminary peer review, the lock date will be the start date of the peer review panel's online review. For the comprehensive evaluation for initial accreditation, the lock date will be four weeks in advance of the peer review team's on-site visit. After the lock date, the institution will may view, but will no longer be able to edit its Assurance Filing at that step of the process.

Peer reviewers will access all materials from the Assurance System.

The Assurance System allows for the institution to upload additional material requested by peer reviewers through an Addendum feature that is activated by the peer reviewers when needed.

The institution should not otherwise provide materials to peer reviewers, as peer reviewers are expected to work from the Assurance System in preparation for and throughout an evaluation.

Additional information about the Assurance System can be found in the Assurance System Manual.

REQUIRED MATERIALS FOR PRELIMINARY PEER REVIEW

The materials submitted for the preliminary peer review are as follows.

1. Institutional Data Form
   - This form is completed by the institution to provide basic institutional data.
   - Download the Institutional Data Form from the Forms Tab of the Assurance System.
   - Complete and upload the form to the Forms Tab of the Assurance System. If including other materials to respond to the data requested by the form, combine all documents (including the form) into a single PDF file before uploading it to the Forms Tab. (Peer reviewers will be able to access the form through the Forms Tab. There is no need to provide a link to this document in the narrative of the Assurance Argument.)
2. Compliance With Eligibility Requirements Form
   - This form is completed by the institution to provide information on its compliance with the Eligibility Requirements.

- Download the Compliance With Eligibility Requirements Form from the Forms Tab of the Assurance System.
- Complete and upload the form and supporting evidence to the Forms Tab of the Assurance System. (Peer reviewers will be able to access the form through the Forms Tab. There is no need to provide a link to this document in the narrative of the Assurance Argument.)

3. Compliance With Assumed Practices Form
   - This form is completed by the institution to provide information on its compliance with the Assumed Practices.
   - Download the Compliance With Assumed Practices Form from the Forms Tab of the Assurance System.
   - Complete and upload the form and any supporting documentation to the Forms Tab of the Assurance System. (Peer reviewers will be able to access the form through the Forms Tab. There is no need to provide a link to this document in the narrative of the Assurance Argument.)
4. **Assurance Filing (Introduction, Assurance Argument at the Summary Criteria level and associated Evidence File)**
   - An overview of institutional history and context is entered in the Introduction Tab of the Assurance System.
   - For the preliminary peer review, institutions will provide narrative focused at the Criteria "summary" level (not the Core Component level, which occurs later).
   - The word limit for the narrative for the preliminary peer review should be approximately 1,500 words or fewer per Criterion summary.
   - Other than specific forms provided by HLC, documents in the Assurance System related to the Assurance Argument are managed through the Evidence File. Materials in the Evidence File must be linked to at least one section of the institutional narrative. Peer reviewers cannot view documents in the Evidence File that are not linked to the narrative.

Access to HLC's Assurance System during the preliminary peer review not only provides an opportunity for the institution to demonstrate its readiness to host a comprehensive evaluation for initial accreditation, but also allows the institution to become acquainted with the Assurance System and to start assembling narrative and evidentiary files for deeper evaluation to occur during the comprehensive evaluation for initial accreditation, during which the institution will write fully to each Criterion's Core Components. In this way, the institution may choose to simultaneously complete requirements for the preliminary peer review and begin drafting its fuller narrative as required for the comprehensive evaluation for initial accreditation.

Although the institution may begin drafting narrative at the Core Component level during the preliminary peer review, peer reviewers will refrain from reviewing anything in the Assurance System at the Core Component level. Reviewers will only review and evaluate the institution's responses to the five Criteria summaries at this stage.

REQUIRED MATERIALS FOR COMPREHENSIVE EVALUATION FOR INITIAL ACCREDITATION

The materials submitted for the comprehensive evaluation for initial accreditation are as follows.

1. Institutional Data Form
   - This form is completed by the institution to provide basic institutional data.
   - Download the Institutional Data Form from the Forms Tab of the Assurance System.
   - If the institution chooses to use a previously completed Institutional Data Form, ensure that it is updated appropriately regarding any information that has changed since the original submission, as well as the time frames for which data is requested.
   - Complete and upload the form to the Forms Tab of the Assurance System. If including other materials to respond to the data requested by the form, combine all documents (including the form) into a single PDF file before uploading it to the Forms Tab. (Peer reviewers will be able to access the form through the Forms

Tab. There is no need to provide a link to this document in the narrative of the Assurance Argument.)

2. Compliance With Eligibility Requirements Form
   - This form is completed by the institution to provide information on its compliance with the Eligibility Requirements.
   - Download the Compliance With Eligibility Requirements Form from the Forms Tab of the Assurance System.
   - When updating the Compliance With Eligibility Requirements Form, institutions should clearly identify for peer reviewers any items that have been updated since the preliminary peer review and, as needed, include information explaining how the institution continues to meet the Eligibility Requirements despite the noted changes.
   - Upload the form in the Forms Tab of the Assurance System. (Peer reviewers will be able to access the form through the Forms Tab. There is no need to provide a link to this document in the narrative of the Assurance Argument.)
3. Compliance With Assumed Practices Form
   - This form is completed by the institution to provide information on its compliance with the Assumed Practices.
   - Download the Compliance With Assumed Practices Form from the Forms Tab of the Assurance System.
   - When updating the Compliance With Assumed Practices Form, institutions should clearly identify for peer reviewers any items that have been updated in the document since the preliminary peer review and, as needed, include information explaining how the institution continues to meet the Assumed Practices despite the noted changes.
   - Upload the form and any supporting documentation to the Forms Tab of the Assurance System. (Peer reviewers will be able to access the form through the Forms Tab. There is no need to provide a link to this document in the narrative of the Assurance Argument.)
4. **Assurance Filing (Introduction, Assurance Argument at the Core Component level and associated Evidence File)**
   - When the preliminary peer review step is complete and HLC notifies the institution that it may proceed, the institution regains full access to its site in the Assurance System and any work it has already completed toward satisfying the requirements of the comprehensive evaluation for initial accreditation.
   - An overview of institutional history and context is entered (or updated) in the Introduction Tab of the Assurance System.
   - At this step of the process, institutions will provide a full Assurance Filing, including detailed narrative—complete with linked evidence—regarding all Core Components.
   - Because institutions write in detail to every Core Component for the comprehensive evaluation for initial accreditation, institutions should focus their efforts on narrative and evidence in those sections, rather than the Criterion summaries. To this end, institutions are encouraged to revise the Criteria summaries that were written for the preliminary peer review so that they are brief and concise (often just a paragraph). This helps ensure that the focus shifts to the Core Components, which are the areas of focus during this step.
   - The word limit for the entire Assurance Argument for the comprehensive evaluation is 40,000 words.
   - Other than specific forms provided by HLC, documents in the Assurance System related to the Assurance Argument are managed through the Evidence File. Materials in the Evidence File must be linked to at least one section of the institutional narrative. Peer reviewers cannot view documents in the Evidence File that are not linked to the narrative.

5. **Supplemental Materials:**
   - Include the following Supplemental Materials as hyperlinks in the Assurance Argument, as described in the Assurance System Manual:
     i. All current faculty and staff handbook(s)
     ii. All current student handbook(s)
     iii. All current institutional catalog(s) or course bulletin(s)
   - Further, include audited financial statements for the two most recent fiscal periods as PDFs in the Evidence File and provide a link within the Assurance Argument in the applicable Core Component section.
6. Federal Compliance Requirements
   - Download the Federal Compliance Filing Form from HLC's website.
   - Upload the completed Filing Form and related appendix, if required, to the Federal Compliance Tab of the Assurance System. (There is no need to provide a link to this document in the narrative of the Assurance Argument.)
7. **Multi-Campus Report (if applicable)**
   - If the comprehensive evaluation includes a multi-campus visit, prepare a report that addresses each campus being reviewed. See the Multi-Campus Visit procedure for details on preparing the report.
   - Upload the report to the Forms tab of the Assurance System. (There is no need to provide a link to the report in the narrative of the Assurance Argument.)

RELATED POLICIES AND DOCUMENTS

POLICIES

Eligibility Requirements (CRRT.A.10.010)

Criteria for Accreditation (CRRT.B.10.010)

Assumed Practices (CRRT.B.10.020)

Federal Compliance Requirements

Jurisdiction (INST.B.10.010)

Eligibility Process (INST.B.20.010)

Candidacy and Initial Accreditation (INST.B.20.020)

Accelerated Process for Initial Accreditation (INST.B.20.032)

Obligations of Membership (INST.B.30.020)

Dues and Fees (INST.B.30.030)

Denial or Withdrawal of Status (INST.E.60.010)

Reapplication Following a Denial or Withdrawal of Status (INST.E.80.010)

Appeals (INST.E.90.010)

DOCUMENTS

Substantial Presence Form

Institutional Data Form

Compliance With Eligibility Requirements Form

Compliance With Assumed Practices Form

Federal Compliance Overview and Filing Form

Dues and Fees Schedule