

BOARD OF TRUSTEES
**Academic & Student
Affairs Committee**

**Wednesday, February 9, 2022
8:30 AM – 10:00 AM**

**Florida Polytechnic University
WEBEX TELECONFERENCE MEETING**

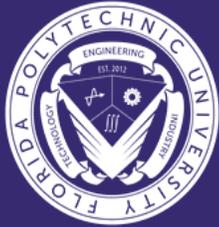
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MEMBERS

Dr. Earl Sasser, Chair	Dr. Laine Powell	Samantha Ashby
Dr. Ala' J. Alnaser	Dr. Narendra Kini	

AGENDA

- | | |
|---|-----------------------------------|
| I. Call to Order | Dr. Earl Sasser, Chair |
| II. Roll Call | Zaira Medina |
| III. Public Comment | Dr. Earl Sasser, Chair |
| IV. Approval of the November 10, 2021 Minutes
Action Required | Dr. Earl Sasser, Chair |
| V. 2020-22 Academic & Student Affairs Committee
Work Plan Review | Dr. Terry Parker
EVP & Provost |
| VI. Provost's Report | Dr. Terry Parker
EVP & Provost |
| A. Approval of Master of Science Degree: "Data Science"
Action Required | |
| B. Approval of Master of Science Degree: "Engineering
Management"
Action Required | |
| C. Approval of the Proposed Final 2022-23 Academic Calendar
Action Required | |
| D. Approval of the Proposed Interim 2023-24 Academic
Calendar
Action Required | |
| VII. Closing Remarks and Adjournment | Dr. Earl Sasser, Chair |



Academic & Student Affairs Committee Meeting

DRAFT MEETING MINUTES

Wednesday, November 10, 2021
10:30 AM – 12:00 PM

Florida Polytechnic University WEBEX TELE-CONFERENCE MEETING

I. Call to Order

Committee Chair Earl Sasser called the Academic and Student Affairs Committee meeting to order at 10:30 a.m.

II. Roll Call

Zaira Medina called the roll: Committee Chair Earl Sasser, Trustee Ala' J. Alnaser, Trustee Samantha Ashby, Trustee Narendra Kini were present (Quorum)

Committee Members Not Present: Trustee Laine Powell

Other Trustees Present: Chair Cliff Otto and Trustee Gary Wendt

Staff Present: President Randy Avent, Dr. Terry Parker, Mrs. Kathy Bowman, Dr. Tom Dvorske, Mr. David Calhoun, Mr. David Blanton, Mr. Kevin Calkins, Ms. Melaine Schmiz, Mr. Mike Dieckmann, Dr. Ben Matthew Corpus, Dr. Kathryn Miller, Ms. Penney Farley, Mr. Andrew Konapelsky, Ms. Lydia Guzman, Mrs. Kris Wharton, Ms. Michele Rush, Mrs. Kim Abels, Mr. John Causey and Ms. Zaira Medina

III. Public Comment

There were no requests received for public comment.

IV. Approval of Minutes

Trustee Samantha Ashby motioned to approve the Academic and Student Affairs Committee meeting minutes of September 8, 2021. Trustee Ala' J. Alnaser seconded the motion; a vote was taken, and the motion passed unanimously.

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

Dr. Terry Parker presented the Academic & Student Affairs Committee Work Plan Review 2020-2022. No changes were made.

VI. Provost Report and Discussion

Dr. Parker presented the graduate program tuition fee waiver and the cost of degrees by comparing the traditional support model with an aid-based model at a lowered tuition rate. Trustee Samantha Ashby inquired if the tuition waiver of \$150/credit hour for graduate students affects the average cost of degree from the University standpoint compared to

University of Florida (UF) data. Dr. Parker responded the UF data was presented as 'budget by students,' and in this case, the 'cost by the state' is seen as a positive.

Trustee Gary Wendt inquired why Florida Poly would cut fees. Dr. Parker responded the current market is competitive, and Florida Poly's cost per credit hour is above local competitors such as UCF and USF. Florida Poly is trying to adjust the price point where income is generated for the school while still growing enrollment.

Trustee Wendt further inquired if the University could make up the difference with grants from the Foundation. Dr. Parker replied at the current time this is not an option. There is a fundamental shift in how Florida Poly is resourcing students; right now, the typical graduate student receives a full tuition waiver and stipend support of approximately \$4,800 a year. Florida Poly will transition to a lower tuition rate which will be paid by the student, and in the end, this translates to approximately a \$1M gain for the University.

Trustee Narendra Kini made a motion to recommend approval of an automatic tuition waiver of \$150 per credit hour for all graduate students who are starting graduate school at the University in academic year 2022-23 to the Board of Trustees. Trustee Samantha Ashby seconded the motion; a vote was taken, and the motion passed unanimously.

Dr. Parker presented Career Planning Training for Florida Poly students. This training is required by Florida HB1261 (2021), section 1006.75(3)(a), Florida Statutes, whereby each university Board of Trustees must adopt procedures to connect undergraduate students to career planning, coaching, and related programs during the first academic year of the student's enrollment. This requirement will begin in fall 2022. The required procedures will be contained in a Career Planning Training module.

Dr. Parker explained that the Career Planning Training module requires students to setup a handshake profile; requires students to complete a self-assessment of "career readiness"; and directs students to financial information regarding career choices.

Additionally, first year students who do not complete the Career Planning Training module will have a hold placed on their student registration prior to the end of their first year of enrollment at Florida Poly. To lift the registration hold, the student must complete the Career Planning Training module.

Trustee Narendra Kini motioned to recommend approval of the procedure presented for "Florida Poly Career Planning Training" as required by section 1006.75(3)(a), Florida Statutes to the Board of Trustees. Trustee Samantha Ashby seconded the motion; a vote was taken, and the motion passed unanimously.

Dr. Parker presented information to support the request for a general tuition and fee waiver, primarily enrollment growth that challenges the University's existing financial aid capacity. A "general" tuition and fee waiver authority is distinct from "special" waivers such as an out-of-state tuition waiver or a graduate tuition waiver. Currently, the increase in waiver authority is necessary to continue to grow the student body and keep the incoming quality of the student at its current level. Dr. Parker explained a large amount of the available financial aid is going to the newest students. As the large entering class progresses to the second year, and as Florida Poly accepts a new class of equal size, the University will naturally have to either decrease the aid per student for next years' entering class or increase the tuition and fee waiver authority.

Trustee Kini inquired if there is an opportunity for graduate students to have a role in research or teaching assistant as a proxy for a waiver. Dr. Parker stated this is not currently offered at Florida Poly.

Trustee Ala' J. Alnaser motioned to recommend approval of \$5M in waiver authority per academic year starting with academic year 2022-23 to the Board of Trustees. Trustee Samantha Ashby seconded the motion; a vote was taken, and the motion passed unanimously.

Dr. Parker presented information on the University's student housing needs. For fall 2022, the University is working with Vestcor to convert single rooms to doubles thereby adding approximately 120 beds. Trustee Wendt inquired why developers aren't clamoring to build dorms for Florida Poly. President Avent responded until the University sends out a Request for Proposal (RFP), the number of respondents is unknown. First, Florida Poly must work with a housing consultant to determine need. Trustee Ashby inquired if the University has considered leasing apartments from nearby communities. Dr. Parker responded Florida Poly did reach out this fall and there was extremely limited availability.

Dr. Parker presented the Admissions outlook for fall 2022 as well as the Student Affairs Department student activity. This included the Freshman Initiative which incorporated an 8-week career design course, and a pilot program of the Quality Enhancement Plan (QEP) for SACSCOC called Florida Poly PEER which partnered with LearnWell Projects this fall.

Two new degree programs are under development: Master of Science in Engineering Management and Master of Science in Data Science. Intended implementation date for both programs is fall 2022.

Dr. Parker concluded his report by updating the progress of the SACSCOC Accreditation Reaffirmation. A conference call is scheduled with the SACSCOC Vice President on November 23, 2021, and an onsite committee visit planned for February 21-24, 2022.

VII. Closing Remarks and Adjournment

With no further business to discuss, the Academic and Student Affairs Committee Meeting adjourned at 11:49 a.m.



FLORIDA POLYTECHNIC
UNIVERSITY

Provost's Report

Terry Parker

Contributions from B.M. Corpus, T. Dvorske, K. Miller

February 9, 2022

Today's Meeting Includes Four "Approval" Items and Reporting and Discussion

- **Approval Items**

- **Graduate Degree Program Approvals:**
 - *Approval of Master of Science Degree: Data Science*
 - *Approval of Master of Science Degree: Engineering Management*
- **Academic Calendar Approvals:**
 - *2022-2023, Final Calendar*
 - *2023-2024, Interim Calendar*

- **Reporting and Discussion**

- **Admissions and Financial Aid (*short report*)**
- **Student Affairs (*career report only*)**
- **Four Year graduation improvement plan**
- **Degree Program Additions and Faculty Hiring Status**
- **Student and Faculty Diversity (in growth discussion)**
- **Graduate Programs**
- **Technology and Pedagogy**

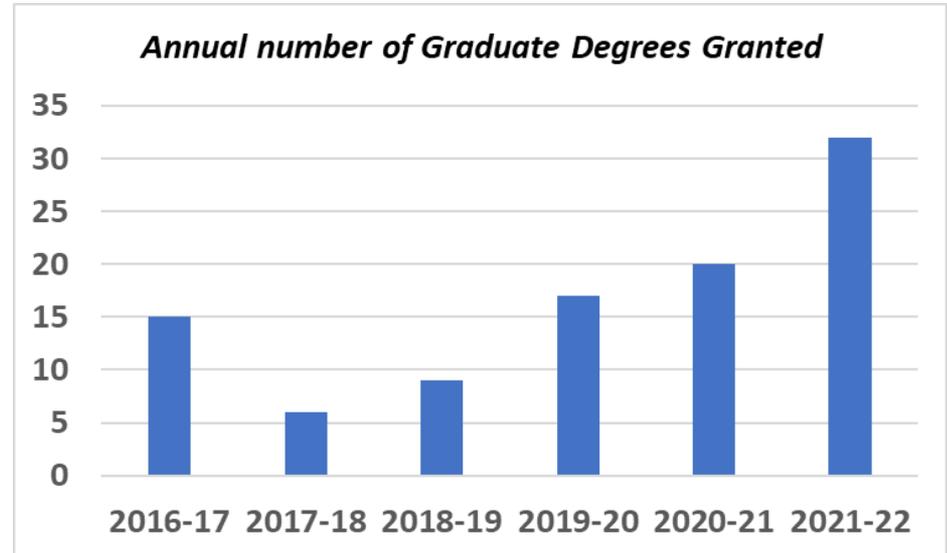
- **Special Discussion Items:**

- **SACSCOC Status**
- **Discussion of Growth**

*Gray font items
will not be
discussed today*

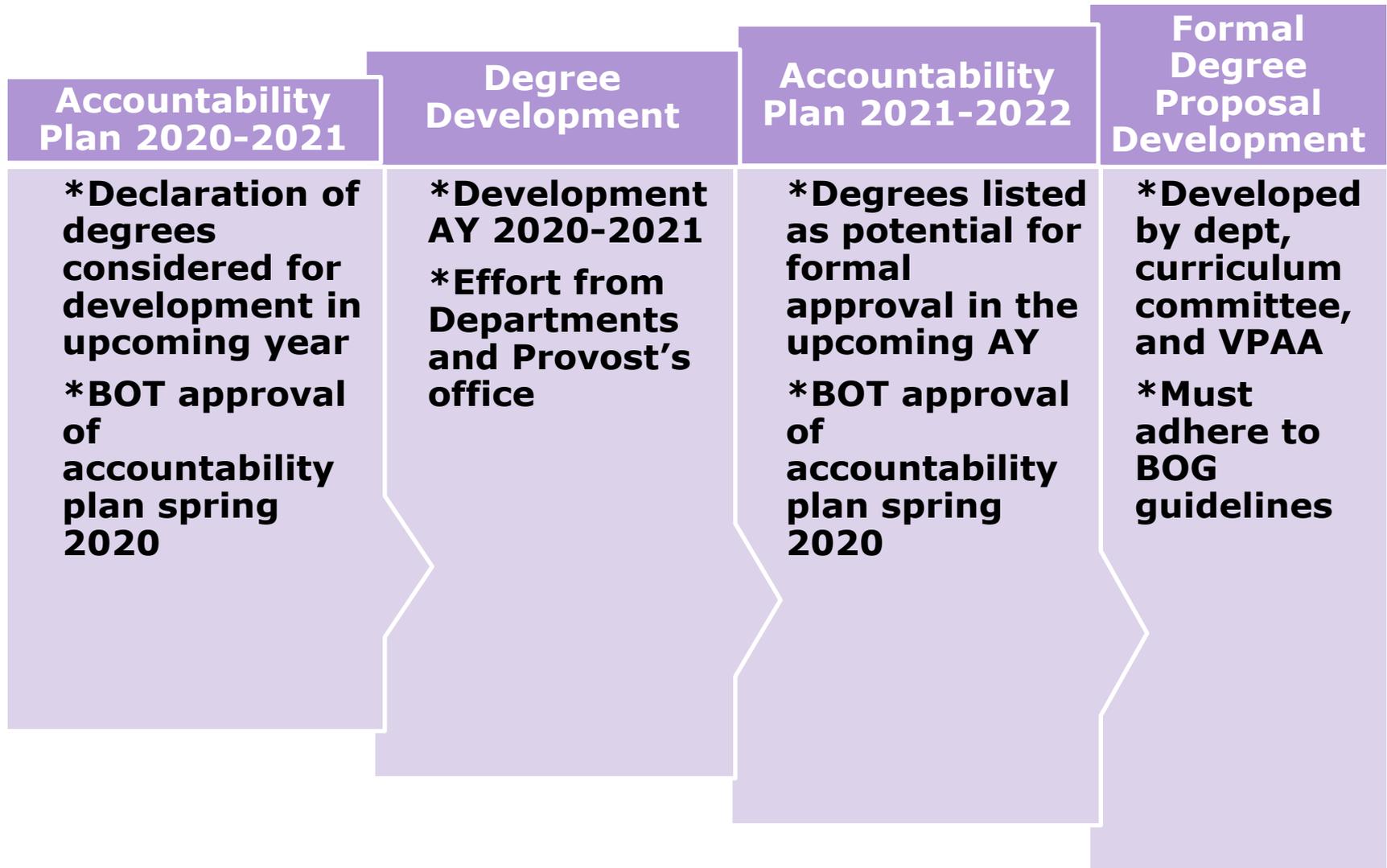
We are evolving the graduate program to further strengthen the university

- **Performance Based Funding “rewards” graduate degrees in strategic emphasis areas**
 - **We need to increase the number of graduates to 25 per year**

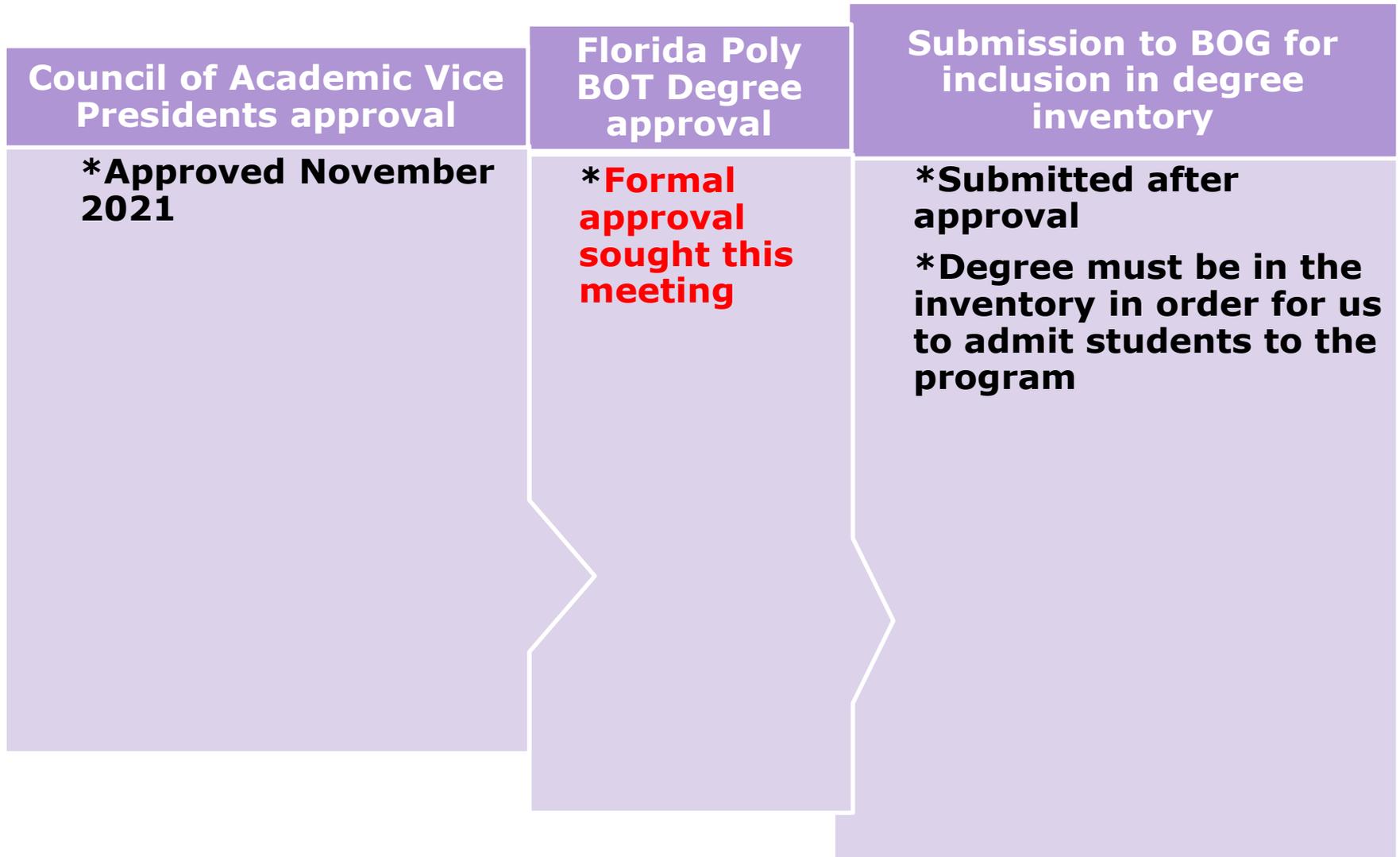


- **We established a thesis and non-thesis track**
 - **Thesis track supports research mission**
 - **Non-thesis track provides a course work only graduate experience in one year or 18 months**
 - *Responsive to “market” sensitivities and lowers university financial commitment per student*
- **Tuition net-pricing has been adjusted to compete with adjacent campuses**
- **Graduate degrees strengthen the undergraduate offering with routine delivery of higher and more in-depth courses**

Formal degree approval is a multi-step process



Formal degree approval is a multi-step process (slide 2)

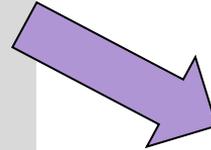


The two new degrees provide degree title alignment for existing degree tracks

- **Master of Science Engineering**
 - Degree Tracks:
Computer Engineering, Electrical Engineering, Engineering Management, Mechanical Engineering, Robotics

- **Master of Science Computer Science**
 - Degree Tracks :
Computer Science, Data Science

Current Graduate Degree Offering



- **Master of Science Engineering**
 - Degree Tracks :
Computer Engineering, Electrical Engineering, Mechanical Engineering, Robotics
- **Master of Science Engineering Management**
- **Master of Science Computer Science**
- **Master of Science Data Science**

Proposed Graduate Degree Offering

Proposed Committee Actions

- **Recommend approval of the Master of Science Degree: “Data Science” to the Board of Trustees**
- **Recommend approval of the Master of Science Degree: “Engineering Management” to the Board of Trustees**



Approval of the Academic Year Calendar

- **BOG regulation requires calendar adoption by March 1 prior to the start of the Academic Year**
 - **By Practice, annually we approve two years in advance**
- **Calendar provided in the premeeting board materials**
 - **Dates follow BOG guidelines**
- **Proposed Committee Actions:**
 - **Recommend approval of the proposed final 2022-2023 Academic Calendar to the Board of Trustees**
 - **Recommend approval of the proposed interim 2023-2024 Academic Calendar to the Board of Trustees**

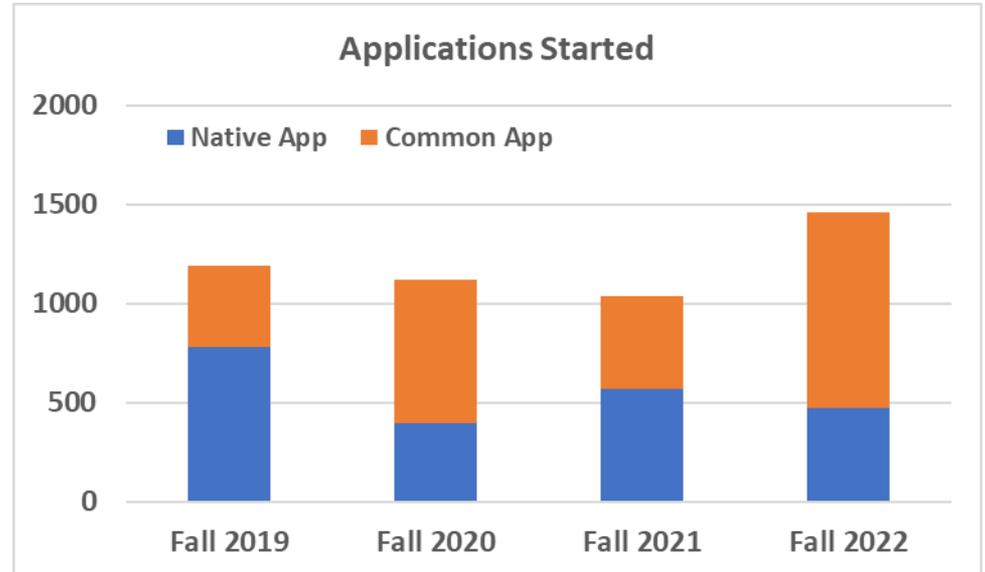
The Admissions outlook for fall 2022 is CAUTIOUSLY optimistic

- **FTIC**

- Applications slightly up compared to each of the previous four years
- Quality is flat in transcripts and board scores

- **Admission reaction to the current environment:**

- **Muddled Landscape**
 - *Some high schools back to normal*
 - *Some not taking visiting admissions counselors*
 - *Some re-launching college fairs, some not*



- **Fall 2022 incoming class goal aspires to match size of Fall 2021 new students with adjustments where possible**
 - Increase in transfers and Grad
 - Stabilize pipeline programs
 - Craft stronger academic mix for Fall FTIC

This slide is from November,
WHAT IS NEW?

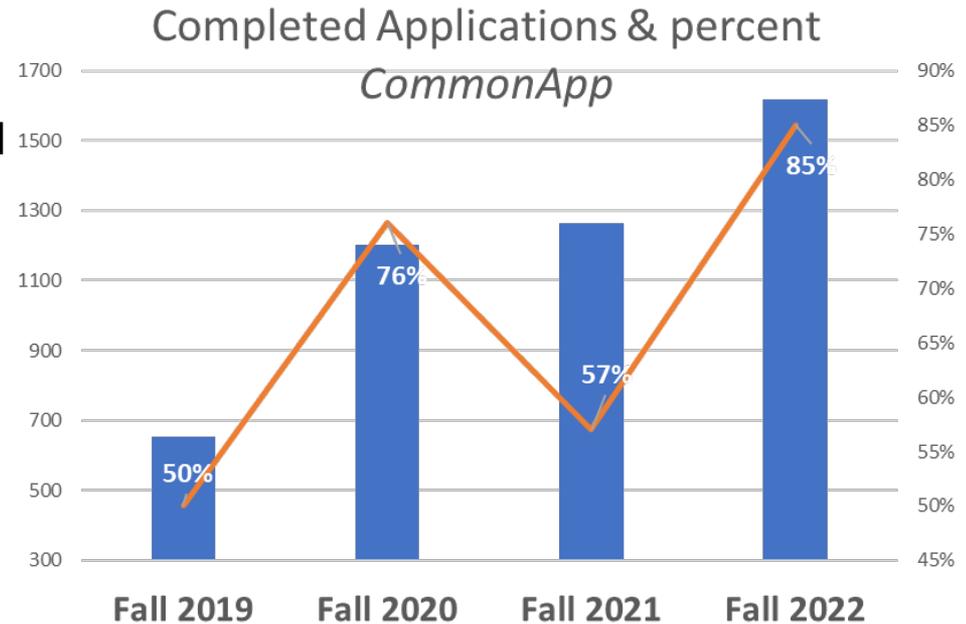
The fall 2022 admission season brings a new set of concerns

- **Good News**

- Applications are up
- Quality is up in admitted students
- Admitted students are up

- **Significant Challenges**

- Housing uncertainty
- Decline in “Yield”
- Covid impact on staff
- Fall recruitment was mixed in-person/online

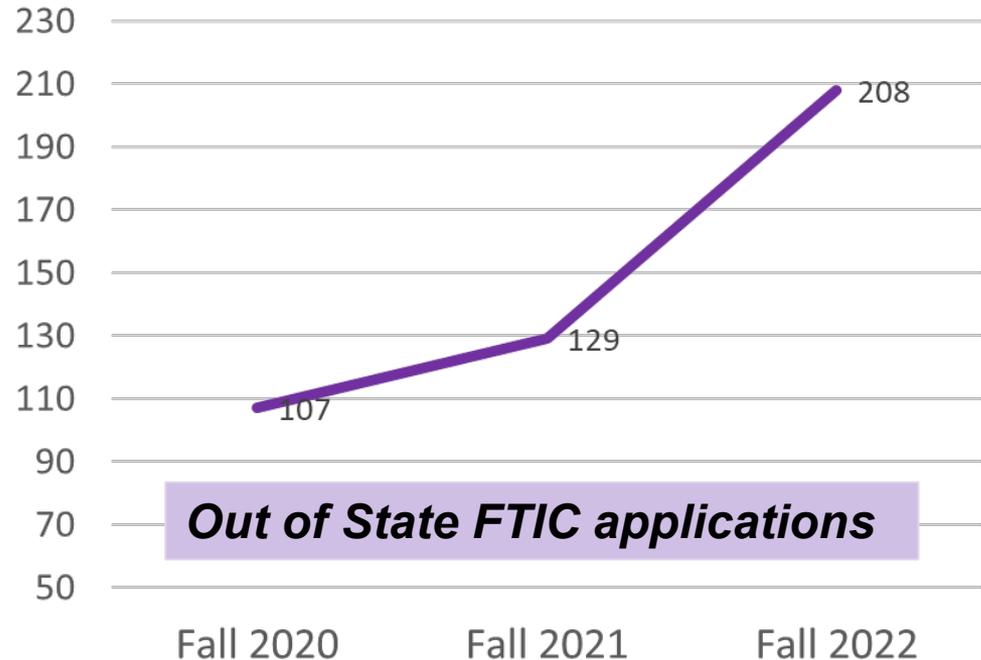


- **Fall 2022 incoming class goal was to be over 600**

- Ongoing housing difficulties impact recruiting, result uncertain
- Stabilization Tactics:
 - *Increase in transfers and Grad*
 - *Stabilize pipeline programs*
 - *Craft stronger academic mix for Fall FTIC*

Academic Quality Strong for Fall Admitted FTIC

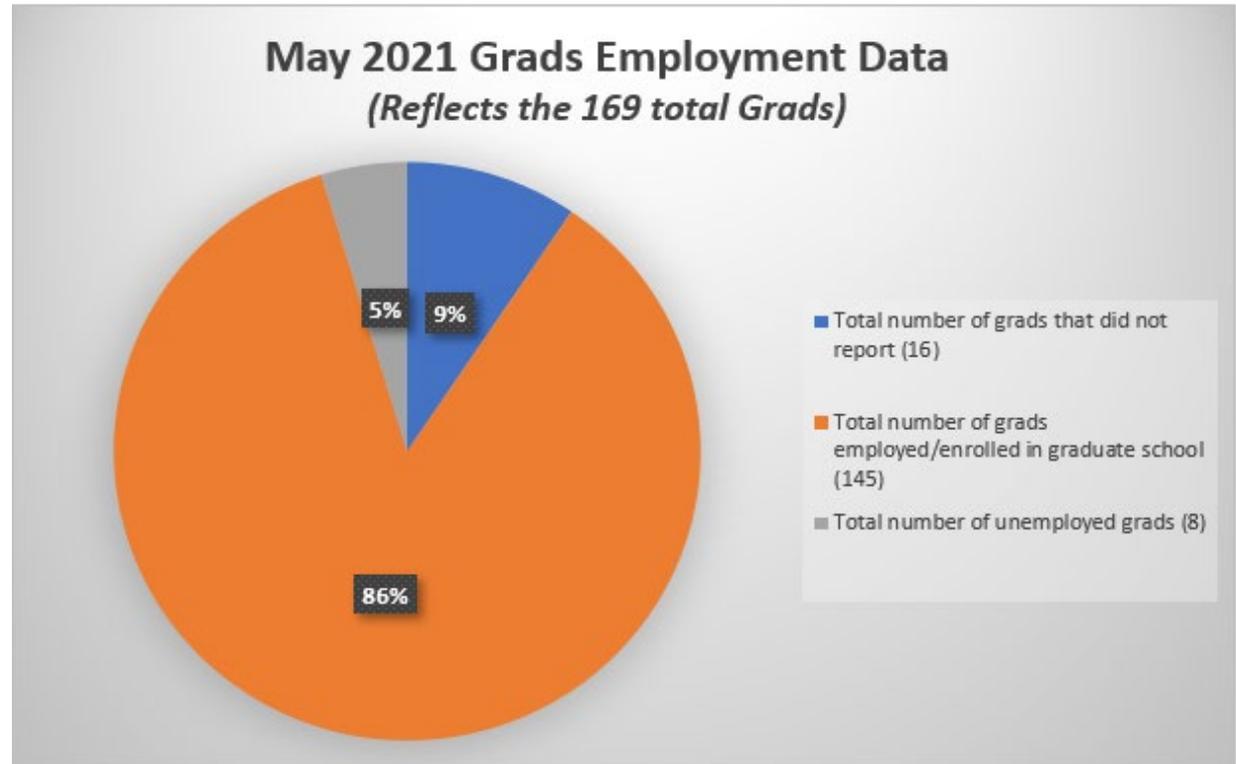
- **Fall 2022 Admitted student SAT highest in our history at almost 1360**
- **Over 50% are in the Top 10% in their HS graduating class**
- **90% are pre-calc or Calc ready highest in our history**
- **Quality of high schools very strong with average GPA of 4.2**



- ***Out of State applications also up: will require extension of out of state waiver at a future meeting***

Career outcomes for our May graduates are strong

- **Over 85% are employed or in graduate school (note unknown status of 9%)**
- **Spring Career fair February 8, 2022 (yesterday)**
 - **Over 60 companies participating**



The Freshman Initiative – Improving APR & 4-Year Grad Rate

- **For the November to February Period:**
 - **Policies:** carefully communicating the importance of Academic Success
 - **Support:** moving the Peer Learning Strategy forward into Spring
- **Policies:**
 - Carefully applying “academic progression” requirements to make certain students have schedules that support degree completion
 - Imposing “drop” limits on courses
 - Creation of an Academic Review Board
 - *Considers students that are not making appropriate degree progress by either dropping classes or having a poor GPA*
 - *284 students reviewed, 39 suspensions*
 - *Please note ~400 students on the Provost’s and President’s list*

Faculty Hiring Targets for the current year have been set and interviews are underway

Department	Fall 2019	Fall 2020	Fall 2021	Hiring activity	Hires likely to be successful
Computer Science	18	14	13	6	4
Business Analytics, Data Science	9	8	9	3	2
Electrical Engineering, Computer Engineering	14	11	11	2	0
Mechanical Engineering,	12	10	12	2	1
Environmental Engineering			4	2	2
Engineering Physics	7	7	5	2	1
Engineering Mathematics	8	8	9	4	3
Arts, Humanities, and Social Sciences	6	5	4	2	2

- **Typical close “rate” on hiring is 50% to 75%, expected faculty count in the fall 2022 is in the low 80s**

Hiring Activity to Date

- **Approximately 25 positions are advertised**
 - floridapoly.edu/facultyrecruitment.
 - **Current pool ~530 applicants**
 - **Hiring Committees are fully deployed**
 - **67% of hires to date are female**
- **Positions filled to date: 6**
 - **Spring 2022**
 - *Dr. Sutanu Bhattacharya – Assistant, Computer Science (9/27/2021)*
 - *Dr. Kathleen Hardesty – Instructor, English*
 - *Ms. Sarah Pearsall – Instructor, English*
 - *Dr. Jing Hou – Assistant, Computer Science*
 - *Dr. Paniz Abedin – Assistant, Computer Science*
 - **Fall 2022**
 - *Mr. Ranses Alfonso Rodriguez – Assistant, Applied Mathematics*



SACSCOC Accreditation Reaffirmation

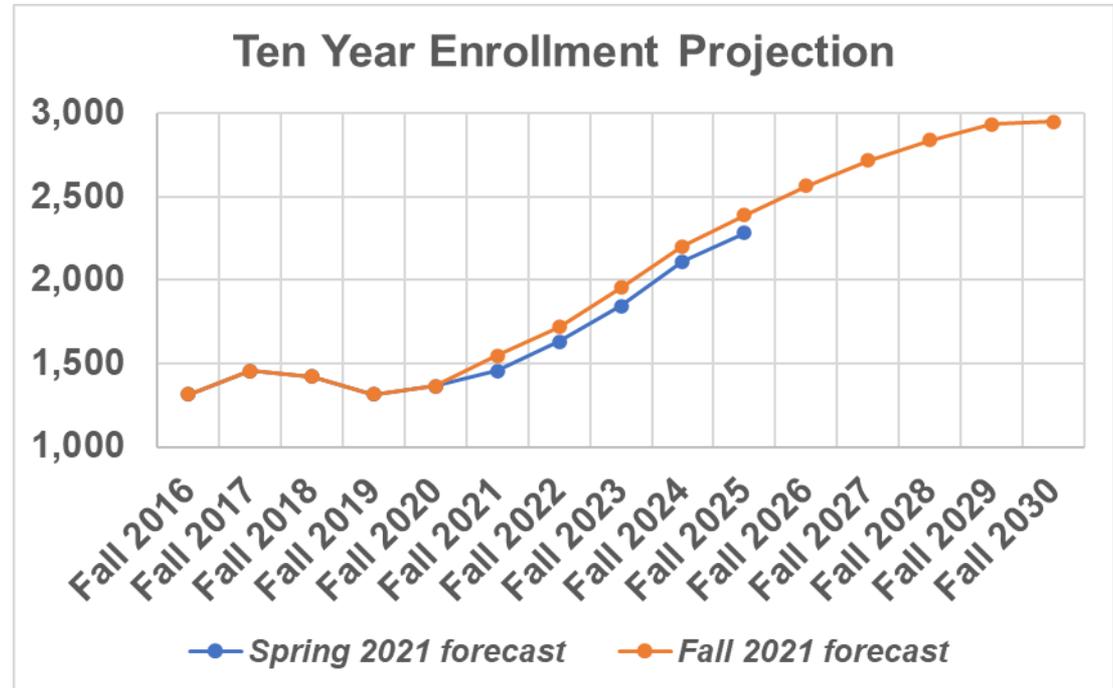
- ✓ **September – Compliance Certification submitted for Off-site review**
- ✓ **November 5th – Off-site Committee’s response**
- ✓ **Areas of concern can be easily mitigated—nothing fundamental or systemic.**
- ✓ **Nov 23 – conference call with our SACSCOC VP**
- ✓ **Jan 10 – Focused Report and Quality Enhancement Plan submitted**
- Onsite Committee Visit February 21-24, 2022.**
- Follow-up report, if necessary**
- SACSCOC Board Decision in December 2022.**

- **The QEP is a multiyear project designed to promote Student Achievement. Florida Poly PEER focuses on peer supported learning enrichment in order to boost Academic Progress and Graduation Rates.**

Board Discussion: Growth and Admissions

- **Discussion with board intended to:**

- **Allow open questions on the process and challenges**
- **Identify areas of concern, e.g. Housing**
- **Provide Board with insight into the “how” of growing**



Goals:

- 1) *Provide insight into the incremental nature of growth,*
 - 2) *Discuss concerns with Fall 2022,*
- Note defer longer term discussions to full board meeting*

There are key factors that are “warning signs” on the growth horizon

- **As a nation, we are emerging from COVID-19**
 - COVID has disrupted admissions processes and flows
 - The EDUCATIONAL disruption from COVID is still not understood or known (but will impact different students differently)
- **Florida SUS has strongly moved to the Common APP**
 - Applications by students are not as “intentional”, yield will be lower
- **Reputationally, we are stronger and our applicants are stronger**
 - The classic “yield curve” shows a decline in yield with increases measures of student quality
- **A key element in admissions is housing**
 - Over 75% of FTIC students live on campus their first year
 - We are at capacity in housing NOW and forecast a bed deficit between 50 and 100 for next fall
 - Local housing availability has tightened significantly in the last eight months

Key Messages for Today

- **Approvals of two graduate degrees and upcoming two years of academic year calendar**
- **Admissions and Financial Aid**
 - **Goal remains for ~600 new students, uncertainties in marketplace and yield factors remain**
- **Student Affairs**
 - **Good results with Career Placement and activity**
- **Four Year Graduation Rate**
 - **Ongoing “freshman initiative” to boost retention: robust application of policies to improve academic progression**
- **Hiring activity: strongly underway for fall 2022**
- **SACSCOC**
 - **In process, upcoming visit**
- **Discussion of Growth and Admissions**

**Florida Polytechnic University
Board of Trustees
Academic & Student Affairs Committee
February 9, 2022**

Subject: Master of Science Degree: "Data Science"

Proposed Committee Action

Recommend approval of the Master of Science Degree: "Data Science" to the Board of Trustees.

Background Information

The proposed Master of Science in Data Science comes out of the University's existing Master of Science in Computer Science program where it is currently one of two tracks offered within the degree. The Department of Data Science and Business Analytics at Florida Poly has offered a Master of Science in Innovation and Technology since 2014 but changed the program name 2018 to a Master of Science in Computer Science with two tracks, a Data Science track and a Computer Science track. This proposal separates the tracks into two degrees, facilitating greater ability for both programs to be more responsive to changes in their discipline and industry.

To date, the data science track has graduated 36 students (including graduates under the previous degree name). The proposed program already exists in curriculum and has the faculty to deliver it. Costs associated with the new program reflect additional faculty over time to contribute to the whole of the department; thus, the figures on page 1 of the proposal reflect portions of faculty time devoted to the program (current and anticipated).

This program will be offered with three pathways: a 10-month, course only option culminating in a project-seminar; a 16-month program that includes an individual or small group project; and, a 2-year, thesis-based option.

The program is 30 credits in length and will be delivered primarily face-to-face with eventual delivery up to 49% via distributed learning methods.

Intended launch date for the program is fall 2022.

Supporting Documentation: Request for Degree Program: MS Data Science

Prepared by: Dr. Terry Parker, EVP & Provost



**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 2022
Proposed Implementation Term

Name of College(s) or School(s)

Department of Data Science & Business
Analytics

Data Science
Academic Specialty or Field

Name of Department(s)/Division(s)

30.7001
Proposed CIP Code (2020 CIP)

Master of Science in Data Science
Complete Name of Degree

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

Maw 2.07.2022
President's Signature Date

Board of Trustees Chair's Signature Date

[Signature] 2/07/2022
Provost's Signature Date

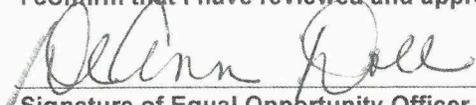
PROJECTED ENROLLMENTS AND PROGRAM COSTS

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	12	8.5	\$10,670.94	\$90,703	0	0	\$90,703
Year 2	20	14.1					
Year 3	28	19.6					
Year 4	35	24.5					
Year 5	40	28	\$5,971.04	\$167,189	0	0	\$167,189

Additional Required Signatures

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


Signature of Equal Opportunity Officer

2-7-22
Date

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


Signature of Library Dean/Director

2-7-2022
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)

The proposed Master of Science in Data Science comes out of the University's existing Master of Science in Computer Science program where it is currently one of two tracks offered within the degree. The Department of Data Science and Business Analytics at Florida Poly has offered a Master of Science in Innovation and Technology since 2014 but was changed in 2018 to a Master of Science in Computer Science with two tracks, a Data Science Track and a Computer Science Track. Both tracks have only two core classes in common. The initial program started with 5 students and has now grown to 18 students. Since initial offering, the program has graduated 36 students out of the data science track.

The Data Science MS track has been coordinated by the Department of Data Science and Business Analytics since the beginning. In addition, all courses have been created previously and have been evaluated to ensure the best curriculum possible for the students. Based on the success of this track, Florida Poly wants to offer a stand-alone degree to cater to students with a wider range of undergraduate disciplines.

Completing the MS in Data Science degree helps students identify and formulate key business challenges, collect and manage data from a variety of sources, select effective analytical techniques to identify solutions, and communicate results in a clear and creative way, harnessing the power of data in decision making. Data scientists are in high demand in a wide range of industries, including information technology, finance, healthcare, insurance, energy, transportation, manufacturing, telecommunications and more.

This program is offered with three pathways: a 10-month, course only option culminating in a project-seminar; a 16-month program that includes an individual or small group project; and, a 2-year, thesis-based option. The proposed program will include a track in transportation analytics to coincide with a similar concentration in the proposed MS in Engineering Management degree program. This has been requested by the Secretary of the Florida Department of Transportation.

The program is 30 credits in length and will be delivered primarily face-to-face with eventual delivery up to 49% via distributed learning methods.

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 master's degree in Data Science supports the SUS Strategic plan 2025 Goals for the state universities by

- Increasing the number of degrees awarded in an area of strategic emphasis
- Increase commercialization activity
- Strengthen the quality and recognition of commitment to community and business engagement

The program lies squarely within the mission of Florida Polytechnic University to “serve students and industry through excellence in education, discovery, and application of engineering and applied sciences.” Data Science provides an avenue for continuing and new students from a range of disciplines to advance their careers with a strong background in decision and data sciences. The program further supports the University's strategic plan priorities around degree alignment and growing the graduate program in STEM and STEM-related fields. The master's in Data Science delivers at the graduate level a focus on the tools, methods, and breadth of applications which are needed to produce decision scientists and decision-support specialists in any industry.

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**

The Department of Data Science and Business Analytics at Florida Poly has offered the Data Science track in the Master of Science in Computer Science since Spring 2018. The program has grown in annual enrollment, but its status as a track-only holds it back from strong marketing and enrollment possibilities. The Department of Data Science and Business Analytics would offer the program, where the track currently resides.

Data Science at Florida Poly integrates coursework in machine learning and advanced computation and programming, utilizing a faculty with strong computer and computation science backgrounds. The program is designed to provide students with any STEM background, including quality social scientists, the breadth of tools to support their careers or career aspirations.

The Department also has strategic industry partnerships that serve as a curriculum advisory board for the department's programs. Partners include Saddle Creek Logistics, Advent Health, and others where our graduates have found employment. The MS in Data Science would be included under the Advisory Board's umbrella for review.

As it is already an existing track, no essential coursework must be developed, nor are any new faculty needed at this time to implement the program and get it through its first two years of operation as a standalone degree.

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.

The program pre-proposal was presented to the CAVP-ACG on November 9, 2021. No concerns were raised.

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.**
- 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.**

Development of future programs begins at the Department Chair, Provost, and President levels in a long-term planning effort that is represented on the University's Accountability Plan. Florida Poly strives to "build-out" a suite of core and cutting-edge engineering programs at the bachelor's levels with graduate degrees that naturally come from these fields and can be supported by existing resources. The University's method at both undergraduate and graduate levels includes concentrations (undergrad) or tracks (graduate), which serve as "incubators" for program development and testing grounds for demand. Based on these as well as perceived and evidenced opportunity, the University moves these programs forward on the accountability plan. As an example of this decision-making changing based on these criteria, a review of our recent APs shows a change from a potential MS in Business Analytics to the proposal in Engineering Management and one in Data Science. These areas both develop more naturally out of our existing faculty and offerings, connect more directly to our stakeholders' interests, and are closer to our core mission. Programs then move forward through the Chairs, are discussed and developed within the department, then go through established University curricular processes.

Planning Process

Date	Participants	Planning Activity Description
Fall 2018	DSBA Department	Implements Data Science Track in recently renamed MS in Computer Science. Data Science coursework already present in previous degree construct/name.
April 30, 2020	Terry Parker, Provost	BOT Accountability Plan Approval
May and July 2020	Randy Avent, President	BOG Accountability Plan Approval
April 20, 2021	Terry Parker, Provost	BOT Accountability Plan Approval
June 23, 2021	Randy Avent, President	BOG Accountability Plan Approval
10/14/2021	Dr. Tom Dvorske, Dr. Shahram Taj	Structure of program curriculum discussion and pre-proposal draft preparation
10/20/2021	Dr. Shahram Taj	DSBA Department comments and input regarding the pre-proposal submission
10/22/2021	Dr. Shahram Taj, Dr. Rei Sanchez-Arias, Ms. Orel Yoshia	Finalize pre-proposal draft and submit to Dr. Dvorske for input
10/25/2021	Dr. Shahram Taj, Dr. Rei Sanchez-Arias, Ms. Orel Yoshia, Dr. Tom Dvorske	Discussion of pre-proposal document for submission
11/09/2021	Dr. Tom Dvorske	Presentation to CAVP-ACG
Jan-Feb 2022	Graduate Studies Committee	Formal review and 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

The following table assumes approval and inclusion in the Inventory by June 2022

Date	Implementation Activity
Jun 2022	Updated letter to Data Science Track students that they may now opt for the MS in Data Science (courses remain the same on the plan of study regardless).
	Update Graduate Catalog and Student Handbook and University Website to reflect new Degree program.
	Begin announcements in anticipation of new recruiting cycle for Fall 2023.
August 2022	Graduate Division Student Orientation Since courses are already scheduled as part of DS track, no registration changes need be made.
Fall – Winter 2022	Development of transportation courses and track within the 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**

Data science was named the fastest-growing job in 2017 by LinkedIn, and in 2018 Glassdoor ranked data scientist as the best job in the United States. Furthermore, a recent study by PriceWaterhouseCoopers states: “The best jobs right now in America include titles like data scientist, data engineer, and business analyst.”

[The U.S. Bureau of Labor Statistics](#) projects that employment in mathematical science and analytics careers will grow by 27.9% from 2016 to 2026. This is much faster than most other occupations and is expected to result in more than 50,000 new jobs. The average annual wage for data scientists and mathematical science occupations is \$103,930. The proposed MS DS Degree combines these fields and also allows students to apply relevant technologies within various Data Science industries.

Florida Job statistics show a 6.2% increase over two years (2019-2021) in CIP-related SOC codes for Data Science/Analytics representing nearly 20,000 jobs.

Graduates of our program have worked in a variety of different industries, including major software companies, Department of Defense, Finance and Insurance Organizations, Transportation, Logistics and Distributions Industries, Marketing and Media, and Large Retail Corporations. We anticipate that our MSDS graduates will place commensurately.

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

In the Master of Science in Data Science program, students will learn to identify and formulate key business challenges, collect and manage data from a variety of sources, select effective analytical techniques to identify solutions, and communicate results in a clear and creative way, harnessing the power of data in decision making. The program focuses on mastering modern data analytics tools and emerging techniques in Data Science.

Student demand is strongly supported by the current and prior interest of students, and graduate applications to the MS in Computer Science, Data Science track. Overall, we anticipate interest from two broadly defined populations – existing and recent undergraduates (at Poly or elsewhere) who wish to accelerate their career track through a complementary discipline

master’s degree. The second group is working professionals. This latter population we expect to attract to the program in a few years as we test our delivery structure and explore additional options for flexible delivery.

Florida Poly maintained a steady growth in enrollments in the MS Data Science track since it began in 2018. The initial program started with five students and has continued to grow. In this academic year, we’ve had one student graduate in December and another eight expected to graduate in May. Current total enrollment for the AY is at 18. To date, 36 students have graduated with a degree in CS – Data Science track. Current applications for the upcoming year outpace those received by this time last year.

We believe that by converting this track to a separate degree, we can grow the enrollment through more specific marketing and curricular opportunities that will attract more students, currently not available to a single track within a degree.

This degree is planned for face-to-face delivery, with less than 50% online. We anticipate the program will attract students from diverse fields and interests that will grow our overall graduate student culture in a positive way.

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 and targets are as follows, noting the 10-month program timeframe:

YEAR	2022-2023	2023-2024	2024-2025	2025-2026	2026-2027
FTE	8.5	14.1	19.6	24.5	28
Headcount	12	20	28	35	40

Initial enrollment projections for year one, as indicated by this table, are actually lower than expectations based on the demand analysis. This is a conservative positioning as our recruiting typically lags into late spring. Moreover, as we cannot advertise this as a standalone degree until approval it puts us beyond the traditional cycle. In the next recruiting cycle, we intend to open up our recruitment efforts to students with more diverse preparations.

Over time, we believe a forty-student cohort is easily achievable and desirable for this program under existing resources and by maintaining a predominately residential delivery mode. The program’s flexible pathways of 10 and 16 months and two years with thesis provide students the ability to suit the curriculum to their career and academic goals. Our total graduate degree production, with existing and proposed master’s programs included, should rise reliably over the next five years.

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.

Qualitatively—The addition of a Data Science master’s degree is a key addition to the program mix both expected from a STEM-engineering institution and an increasingly in-demand need in every industry. The program will further help us draw faculty to the DSBA department as they will have the opportunity to teach at the graduate level and mentor students. The program will, in short, grow the university’s reputation as an already [excellent institution](#) for studying data science.

Quantitatively—There is a high interest in graduate training in data science by recent undergraduates in a wide range of disciplines, and early-career professionals in industries that aim to harness the power of data. The current MS in CS Data Science track has been completed by 36 students (including those who completed earlier data analytics curricula). Many of these students are presently working in information technology (1), healthcare (1), insurance (1), transportation (2), marketing and media industries (1) locally and in the state. We anticipate that our MSDS graduates will be placed commensurately.

Salary.com, Indeed.com, and other sites typically show data scientist starting salaries between \$50 and 85 thousand. The University presently leads the system in average salary for baccalaureate level graduates.

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.

SUS Institutions

Current programs at the MS-level in the system include programs at FAU, FIU, Florida State, and UWF. These are programs in the 30.7001 and 11.0802 CIPs. Data Science or Analytics in other forms is also found at UCF, USF, and UF. The duplication of the program indicates its foundational nature in our fast-changing world, where data science is critical to every industry.

As a STEM only institution, a program at the master’s level in data science is a reasonable expectation of prospects and commensurate with peer institutions and aspirational peers. In order for Florida Poly to be competitive nationally, programs such as this are critical to its growth. Communication related to the implementation of our program has been shared with these institutions. Our faculty in Data Science currently collaborate with colleagues at USF and other SUS institutions on research. We also work with UCF and USF on a future-faculty program where their doctoral students have opportunities to teach at Florida Poly as part of a career development program. One recent UCF graduate who went through this program is a tentative hire for a position at the Assistant Professor level.

Florida-Private

Of the private colleges and universities in Florida, the following have graduate programs in Data Science or related: Embry-Riddle, Florida Institute of Technology, Jacksonville University,

Nova Southeastern, Polytechnic University of Puerto Rico, Saint Leo, Schiller University, and St. Thomas University. These curricula bear varying levels of similarity to our proposed program. We have not reached out to these institutions to discuss impact or collaborations. Moreover, the cost of these institutions makes it unreachable for a lot of Florida residents. Our program provides the advantage they need in a low-cost, high-quality, fast-paced program with multiple options for completion.

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.

Communications describing the University's proposed program were sent to Deans at FAMU and FIU on 2/1/2022.

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)

Admissions

Admission to the Graduate Division and programs at Florida Poly is a selective, multi-step process beginning with initial screening in the Office of Admissions, followed by review and decision at the academic department (program) level. Factors considered in making admissions decisions include, but may not be limited to, the following:

- (a) The quality of the applicant's undergraduate and/or graduate work done at all previous institutions attended;
- (b) Undergraduate and/or graduate grade point averages, and performance in specific major-related courses;
- (c) Scores on standardized admission tests;
- (d) The motivation and attitude of the applicant as determined by the applicant's personal statement, letters of reference and/or a personal interview or other means.

Florida Poly regulation [FPU-2.008](#) Graduate Admissions details this and other related information.

Typically, undergraduate GPA must be a 3.25 or better or, where lower, a GRE score may suffice to bridge the gap. Departments closely examine students' technical background and capability of working independently, conducting research, and evaluate reference letters.

Graduation

Graduates must complete the 30 credit program with a GPA of 3.0 or better and at least 2/3 of the credits applied toward the degree must come from the University. Other specific requirements may be imposed depending on the student's background or preparation (e.g. courses for leveling in mathematics or coding that may not count toward the credits for the degree). All work must be completed within the 6-year period immediately preceding the degree conferral. Florida Poly Policy [FPU-5.0096A](#) delineates these and other requirements.

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

Program Learning Outcomes

Upon completion of the for the Master of Science in Data Science, students are expected to demonstrate the following outcomes:

1. Demonstrate mastery in analyzing complex problems and applying knowledge of data science to formulate solutions.
2. Communicate data science information clearly and effectively through presentations and

- technical writings to both expert and non-expert audiences.
3. Demonstrate critical evaluation of recent research literature.
 4. Identify a novel relevant research problem in a chosen data science research field, perform the literature survey for the problem, create a plan to solve the problem, carry on the plan, and defend the research.
 5. Recognize appropriate practices in the field of data science and their ethical implications.

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 MS in Data Science is a 30 credit-hour program. The following table shows the prospective plan of study and electives.

Plan of Study: MS in Data Science		
Term	Course	Cr
Fall 1	COP 5727 - Advanced Database Systems Design	3
	COP 5090 - Scientific Computation and Programming	3
	CAP 5771 - Data Mining & Text Mining	3
Spring 1	Data Wrangling and Exploratory Data Analysis	3
	Data Science Program Elective	3
	Data Science Program Elective	3
Fall 2	Data Science Program Elective	3
	Data Science Program Elective	3
	IDS 5970 Thesis 1 or Data Science Program Elective	3
Spring 2	IDS 5975 Thesis 2 or IDS 5950 Project or IDC 6000 Graduate Seminar	3
	Total Credits	30
List of Data Science Electives		
	QMB 5565 - Quantitative Empirical Research Methods	3
	CAP 5775 - Data Warehousing	3
	ESI 5315 - Optimization and Simulation	3
	CAP 5634 - Advanced Artificial Intelligence	3
	CAP 5735 - Data Visualization and Reproducible Research	3
	CAP 5765 - Computational Data Analysis	3
	CAP 4786 - Topics in Big Data Analytics	3
	STA 4853 - Time Series Analysis for Business, Data Science, and Economics	3
	QMB 5565 - Quantitative Empirical Research Methods	3

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

Course	Course Description:
COP 5727 - Advanced Database Systems Design	Datacenter infrastructure and management including technologies such as: virtualization, networking, server consolidation, green IT computing, and network storage configurations are discussed. The utilization of virtualized platforms, networking and infrastructure configurations as well as the deployment, analysis and management of applications are also presented.
COP 5090 - Scientific Computation and Programming	The course will introduce the students to scientific computing and graphics using R. The topics covered include programming with R, Numerical Accuracy, Root finding, Integration, Ordinary Differential Equations, Probability and Random Variables, Estimation, Markov Chains, and Basic Simulation.
CAP 5771 - Data Mining & Text Mining	This advanced course addresses the knowledge discovery process and the use of data mining concepts and tools as part of that process. In depth analysis of processes for automatically extracting valid, useful, and previously unknown information from data sources and using the information to make decisions is also covered.
CAP 5320 - Data Wrangling and Exploratory Data Analysis	Preprocessing tasks often consume a large fraction of time in computational projects, and all downstream analyses depend on them. In this course, students will develop practical skills for working with large datasets. Topics will include common methods for gathering, organizing, and reshaping structured and unstructured data. We will also cover methods of exploratory data analysis that are useful to guide more focused questions and models. These include principles of information display, simple model forms and data reduction, common visualization methods, and reporting tools.
IDS 5970 Thesis 1	Students will explore and conduct original research on a topic, under the guidance of a faculty member. The student must submit a thesis proposal approved by a thesis committee and successfully defend the work in a public venue. The thesis should facilitate engagement with academic and professional communities and STEM related industries. A successful thesis will explore, evaluate and extend creative uses of emerging methods, models and processes and make a significant contribution to the body of knowledge of the field. This course is part one of the two-part thesis option.
IDS 5975 Thesis 2	Students will explore and conduct original research on a topic, under the guidance of a faculty member. The student must submit a thesis proposal approved by a thesis committee and successfully defend the work in a public venue. The thesis should facilitate engagement with academic and professional communities and STEM related industries. A successful thesis will explore, evaluate and extend creative uses of emerging methods, models and processes and make a significant contribution to the body of knowledge of the field. This course is part two of the two part thesis option.
IDC 6000 Seminar	Culminating course for graduate programs where student engage in an industry supported problem related to their field and deliver solutions based on research, current analysis and simulation.

Course	Course Description:
IDS 5950 Project	Students will conduct a literature review and develop a proposal for a technical project under the supervision of graduate faculty. The project should facilitate engagement with both academic and professional communities and STEM-related industries. A successful project will explore, evaluate and extend creative uses of emerging methods, models and processes, and may include a professional experience with a company or external organization. This course may be repeated once for credit.
QMB 5565 - Quantitative Empirical Research Methods	This course will begin with a concentrated review of probability, distributions of random variables, and hypothesis testing, and move on to provide a foundation in applied multivariate statistical methods. The course will focus not just on estimating models, but also on specifying, evaluating, and refining models to support a problem driven research agenda.
CAP 5775 - Data Warehousing	Advanced techniques for building and populating a data mart to support the planning, designing and building of business intelligence applications and data analytics are covered in this course, along with data governance, stewardship, and security.
ESI 5315 - Optimization and Simulation	This course familiarizes the student with frequently used models in Operations Research. Such models include decision analysis; optimization techniques, and Discrete-Event Simulation. Course is supplemented with real world examples and cases.
CAP 5634 - Advanced Artificial Intelligence	This course expands on fundamental concepts such as search and knowledge representation and applied work in areas such as planning, game playing, and vision. Topics included: logical reasoning, constraint satisfaction problems, graph search algorithms, Bayes rule, Bayesian networks, multi-agent system, neural networks, decision trees, and natural language processing.
CAP 5735 - Data Visualization and Reproducible Research	A project-centered introduction to the visual display of quantitative information for both knowledge discovery and the communication of results. Fundamentals of reproducible research with attention to best practices and modern frameworks for data science project collaborations.
CAP 5765 - Computational Data Analysis	This course explores advanced topics in statistical data analysis and computability. It prepares students to perform big data analysis and organization using machine learning and data mining techniques and algorithms. Topics include multivariate statistical methods, computational statistics, classification, clustering, prediction, regression analysis, and principal components analysis.
CAP 4786 - Topics in Big Data Analytics	This course provides the fundamental knowledge to capture and analyze all sorts of large-scale data from a variety of fields, such as people behavior, sensors, biological signals, finance, and more. Platforms for data storage system and distributed processing of large data sets, Hadoop HDFS and MapReduce, Spark, and others, and different ways of handling analytics algorithms on different platforms will be introduced.
STA 4853 - Time Series Analysis for Business, Data Science, and Economics	The objective of the course to develop student's ability to build models of time series data appropriate to the properties exhibited by the data, apply appropriate techniques to forecast future values, conduct forecast validation, and analyze the strengths, weaknesses, and limitations of forecasts in their intended use.
QMB 5565 - Quantitative Empirical Research Methods	This course will begin with a concentrated review of probability, distributions of random variables, and hypothesis testing, and move on to provide a foundation in applied multivariate statistical methods. The course will focus not just on estimating models, but also on specifying, evaluating, and refining models to support a problem driven research agenda.

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 proposed program consists of coursework taught primarily in the Department of Data Science and Business Analytics. One course, COP 5090 Scientific Computation and Programming is typically taught by a DSBA professor, although it may also be taught by a CS Department faculty member. Given that both CS and DSBA have the same department chair, this is not expected to be a problem. All proposed courses are currently delivered through the DSBA department and COP 5090 is a course common to all of our master's degree programs. All Graduate curricula are coordinated by the Graduate Division, led by the Vice Provost of Academic Affairs and supported by the Graduate Management Team, which consists of department chairs for degree-granting programs/tracks. The Graduate Studies Committee serves as the curriculum and policy committee for all graduate programs and supports the Division in graduate quality management. Ultimately, the Provost holds all decision-making authority in terms of coordination and collaboration on course and program delivery.

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 proposed program will be offered only on the J.D. Alexander Main Campus of Florida Polytechnic University, 4700 Research Way, Lakeland, FL 33805.

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 proposed program is intended to be offered face-to-face. The university is authorized to offer up to 49% of a program via distributed learning methods. At this point, there are no concrete plans to offer any coursework via distance learning. A greater likelihood is that some courses may be offered in a hybrid format where at least 50% of the course must be attended in person. No additional costs would be needed to delivery in alternative modalities. Consideration to do so is driven by efficiency and cost considerations and enrollment planning.

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.

Students enrolled in Florida Poly's program may take up to 12 credits from other SUS or private institutions and apply those credits toward the degree at Florida Poly, presuming alignment with program outcomes and content.

Faculty aligned with the proposed program are engaged in research collaborations with colleagues at USF and elsewhere in the SUS.

Communication with FIU and FAMU has gone out regarding impact on enrollments, as well as communication on the program to nearby institutions with similar degrees (USF, UCF).

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.

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.

Not applicable. The program does not require any specialized accreditation.

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.

The University is currently undergoing a SACSCOC onsite visit (Feb 21-24, 2022). Offsite evaluation found no compliance issues with respect to our academic degree programs. Four undergraduate programs are accredited by ABET-EAC and ABET-CAC.

Program Review Recommendations

An internal program review was conducted during 2021, completed in the fall term, in compliance with University Policy and BOG regulation. The program review led to the following conclusions:

Broadly, recommendations for improvement fall along four areas: increase degrees granted by creating accelerated pathways; split the two tracks into two degree programs to better facilitate marketplace needs; improve course (and therefore) program quality; and, reach a sustainable funding model.

1. **Pathways:** The program has always been set up as a 2-year master's degree, culminating in a thesis for most students who may or may not complete in the two-year timeframe. This slows the production of degrees while making it costly from a faculty time-standpoint as well as institutional expense. As the program transitioned from Innovation and Technology to Computer Science, it moved strongly into the thesis only focus, for which it was not entirely prepared, particularly in student quality and research money foundation. Thus, it has increasingly included projects as a culminating experience for students.

As the University explores four possible pathways for the engineering degree, the same consideration will need to be made for CS and DS where one-year, 16 month, and two-year options (thesis, project, coursework only) are considered. At this stage, CS cannot afford the fully thesis-based master's degree and will have to consider different pathways to support program continuity and faculty research.

2. **Structure:** The degree program is currently limited by the existence of two tracks that would function better as separate programs. The degree name is computer science and includes tracks in both computer science and data science. By splitting it into two degree programs, the CS program can focus on more industry-specific areas of preparation around software engineering, computer and network security, or simulation. Similarly, a standalone Data Science degree enhances our ability to grow the program with specific data science sub-fields such as health systems, transportation analytics, and financial technology. As it stands, the

program is relatively vanilla in both areas and marketplace/degree alignment opportunities are missed.

3. **Quality:** recent efforts in hires and reorganizations within the Academic Departments has brought about the opportunity to focus on course consistency and quality and ensure that courses delivered at the graduate level require greater effort and higher expectations than those at the undergraduate. The recommendation here is that each track examine its course offerings, course outcomes with respect to program outcomes, requirements and course content to ensure relevant and appropriate inclusion of literature in the discipline and research as both a product but also a mindset that supports long-term career success.
4. **Funding:** From a tuition and fees standpoint, the program is highly competitive; however, it is strongly subsidized by institutional funds and waivers. Fewer than 15% of graduate students receive some level of extramural funding, and assistantships are mostly across the board because it's a recruiting tool. Assistantships come with an out of state tuition and fee waiver, plus a stipend that is small given cost of living and recently increased to reduce the number of students engaged in outside work.

The funding question is tied directly to the pathway question but impacts CS in one unique way. As this program has enjoyed the lion's share of GAs, it will have to rethink the possibilities of playing in one of the pathways as the University simply cannot afford to support this portion of students as thesis-bound GAs. Considerations of a 1-year or 16-month project/internship program could prove to be highly beneficial.

Progress on Recommendations

1. **Pathways** – curriculum changes and critical decisions related to different time-pathways to degree completion have been supported by Graduate Management and Graduate Studies Committees and approved by the Provost. Recruiting based on these pathways is underway.
2. **Structure** – this proposal is a key result of this recommendation. The overall integrity of the MS Computer Science degree will be improved by moving the Data Science track to a new degree program. It also affords opportunities to offer tracks within Data Science (and Computer Science) that support industry and state interest as well as providing technical focus and coherence in the Computer Science degree.
3. **Quality** – In developing the pathways, a review of course offerings was undertaken that included revisions and proposed new courses to support all graduate offerings and, specifically, course-only pathways. Departments have also disconnected most undergraduate/graduate courses, with some exception, and syllabus review requirements in each department are focusing in the quality of the graduate course offerings. DSBA graduate-level offerings have been exemplars among graduate courses.
4. **Support** – The Board of Trustees approved a tuition waiver for graduate-level courses to reduce the overall cost of tuition to attend any of Florida Poly's graduate programs. This enables us to deliver the course only (non-GA) options where tuition can be charged at a reasonable rate and over a shorter period of time, thus reducing the overall cost to the student, while bringing revenue to the institution that it currently does not accrue due to a heavily thesis-based program where students are nearly 100% supported as Graduate Assistants by institutional funds.

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.

The Department of Data Science and Business Analytics routinely collaborates with industry via our curriculum advisory boards and through regular adjunct faculty appointments with area industry employees.

The proposed program draws on these and other interactions to inform curricular decision-making and content. The next scheduled CAB (Curriculum Advisory Board) meeting is scheduled for end of spring 2022 term to coincide with our Capstone Design Day, where all seniors deliver the results of their industry sponsored projects.

The CAB agendas review all departmental programs and provide insight into new and developing areas and employer preferences in terms of graduate aptitude along specific knowledge areas.

The existing track reflects industry input in its initial development and will continue to benefit from our CAB processes.

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.

The program will be delivered primarily by three faculty in the department whose expertise covers the range of courses offered. An additional two positions are planned for fall 2024 that will support the overall department’s estimated growth as well as in this program. These will be multi-year appointments.

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 table provides a snapshot of the program faculty’s efforts covering approximately 2 academic years (excluding summer). As a note, Departmental Service includes search committees, curriculum committees, student advising, and in some cases reappointment or promotion committee work (Associate or Full). Other service is noted more specifically. Research is not exhaustively listed here. Readers should look at the curriculum vitae for more detail.

Faculty	SCH Production (2-year)	Typical Service Role	Recent Research and Related Activities
Rei Sanchez-Arias, Asst. Professor, Asst. Department Chair	Sp’22 – 117 Fa’21 - 138 Sp’21 – 162 Fa’20 - 276	Assistant Department Chair; Graduate Studies Committee;	In last year- 3 publications; 4 invited talks; 4 conference presentations, one grant funded, one grant submitted. Graduate Thesis Advisor, Graduate Project Advisor, Department coordinator graduate advising (9 students)

Faculty	SCH Production (2-year)	Typical Service Role	Recent Research and Related Activities
Sravani Vadlamani, Asst. Professor	Sp'22 – 195 Fa'21 - 282 Sp'21 – 204 Fa'20 - 342	Departmental Committee— curriculum, assessment; research committee. Search Committees; other University Service.	In last year – Internal technology grant for course improvement; one publication; one presentation; Graduate Thesis Advisor/Graduate Project Advisor;
Lizhen Shi, Asst. Professor	Sp'22 – 195 Fa'21 - 97 Sp'21 – 120 Fa'20 – not yet hired	Departmental Committee— curriculum, assessment; research committee. Search Committees; other University Service.	In last year – multiple publications/presentations; research pres to University BOT; Graduate thesis committees.

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.

Table 3A shows the reallocated E&G as it relates to faculty salary and benefits. The amount shown depicts multiple faculty based on their percentage of time devoted to the program (teaching, primarily) with other roles part of their regular workload and administrative function already present within the department and the University through Graduate Division coordination and support. Approximately two additional hires to the department are anticipated after year one, along with a basic rate of increase over time to bring the figure up in year five. Again, this is apportioned across faculty time dedicated to the program.

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.

In 2018, the University received \$4.8 million in faculty salary funding, recurring. Subsequent new degree programs have been built out of this funding, including, most recently, our Bachelor of Science in Cybersecurity Engineering. Our analysis showed that the balance of this 4.8 million after year five, accounting for its expenditures in all newly implemented programs, would leave a remainder of \$2.6 million. Minus the \$1.28 million budgeted for Cybersecurity Engineering leaves us with the base amount noted in Table 4. From this base, the program will be easily funded. The analysis accounts for implementation of both an MS in Engineering Management and an MS in Data Science.

The University practices a centralized method for appropriating faculty and academic affairs staff lines, meaning when an employee leaves, that line comes back to the Provost's office for redeployment where necessary and not always in the same unit. This results in a somewhat regular flow of salary savings over time, which, while not accounted for in this budget, supports the rest of the academic enterprise as reorganizations are needed to match demand and priorities.

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.

Current resident and non-resident tuition and fees per credit hour are shown in the following tables:

Residents

By AY	Per Credit Hour	Waiver	Tuition and Fees Paid
Prior to fall 2022	472.58	-	472.58
Eff. Fall 2022	472.58	150.00 (BOT Approved)	322.58

Non-Residents

By AY	Per Credit Hour	Waiver	Tuition and Fees Paid
Prior to fall 2022	1110.98	638.40	472.58
Eff. Fall 2022	1110.98	788.40 (BOT Approved)	322.58

The University is not positioning the program as continuing education nor as market-rate prices. At present, our graduate programs are heavily supported by the institution, where students typically receive scholarships for the remainder of tuition and a stipend for their assistantship. This course-only model with the shift in cost per credit hour enables us competitively with out of state markets (as well as in-state) and turns what would otherwise be institutionally funded students into tuition-paying students. The accelerated time minimizes the cost over time and the period during which a student may need assistance for cost-of-living (i.e., federal aid). Thus, while asking students to pay, the University is also reducing their total cost of attendance.

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.

At this time, we do not have external resources to support the program. The change in tuition and fees are designed to offset the amount of the program supported through E&G funds.

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 reviewed Sections VIII.A. and VIII.B.

The Florida Polytechnic University Library is comprised of two distinct collections: the main library collection and the Florida Industrial Phosphate Research (FIPR) Institute collection is primarily a print 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 a virtual library and to maintain an all-electronic collection. 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 electronic collection contains over 150,000 full text eBook volumes that are a mixture of owned and licensed materials.

The University Library provides support for all the degrees offered at the institution, including master's degrees in engineering and computer science and four ABET accredited bachelor's degrees. In addition to our eBook collection, the library also provides access to journal articles and other scholarly publications. These resources are discoverable by searching the library catalog or by accessing subscribed databases through the library's main LibGuide. Resources that directly support Florida Poly's current engineering programs will also directly support the proposed Engineering Management program. Current library resources include the ACM Digital Library, ASME Digital Library, Elsevier's Science Direct and Engineering Village, IEEE Xplore Electronic Library, and ProQuest's SciTech Premium and ABI/Inform Collections, and ProQuest eBook Central.

Major journals currently available through the Florida Poly Library that will directly support Data Science include:

- ACM/IMS Journal of Data Science (2021 – Present)
- Annals of Data Science (2014 – Present)
- Big Data Mining and Analytics (2018 – Present)
- IEEE Transactions on Big Data (2015 – Present)
- IEEE Transactions on Knowledge and Data Engineering (1989 – 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.

Program will use existing facilities and equipment currently available. Space will be allocated to full-time graduate students in the upcoming Applied Research Center (ARC) building.

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.

No new assistantships will be applied to the program. Overall, the University is shifting its support for graduate assistants from E&G to extramural funding. Current levels of support will gradually come down as existing supported students graduate.

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			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		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		X	X	X
E	Faculty Curriculum Vitae			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.		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		X		

H	Request for Limited Access Status	Required only for baccalaureate degree programs seeking approval for limited access status		X		
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Table 2. Additional Appendices

Appendix	Appendix Title	Description
A	BOG Tables 1 – 4	Enrollment and Finance
B	Internal Letters	Not applicable
C	Faculty	Curriculum Vitae

Appendix A. BOG Enrollment and Finance Tables

APPENDIX A
TABLE 1-B
PROJECTED HEADCOUNT FROM POTENTIAL SOURCES
(Graduate Degree Program - MS DS)

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
Individuals drawn from agencies/industries in your service area (e.g., older returning students)	1	0.7	2	1.4	3	2.1	4	2.8	4	2.8
Students who transfer from other graduate programs within the university**	1	0.8	2	1.5	2	1.4	3	2.1	3	2.1
Individuals who have recently graduated from preceding degree programs at this university	9	6.3	15	10.5	22	15.4	26	18.2	31	21.7
Individuals who graduated from preceding degree programs at other Florida public universities	1	0.7	1	0.7	1	0.7	1	0.7	1	0.7
Individuals who graduated from preceding degree programs at non-public Florida institutions	0	0	0	0	0	0	1	0.7	1	0.7
Additional in-state residents***	0	0	0	0	0	0	0	0	0	0
Additional out-of-state residents***	0	0	0	0	0	0	0	0	0	0
Additional foreign residents***	0	0	0	0	0	0	0	0	0	0
Other (Explain)***	0	0	0	0	0	0	0	0	0	0
Totals	12	8.5	20	14.1	28	19.6	35	24.5	40	28

* 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 (MS DS)
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	Lizhen Shi, Ph.D Computer Science	Asst. Prof.	MYA	Fall 2022	9	0.75	0.50	0.38	9	0.75	0.50	0.38
A	Rei Sanchez-Arias, Ph.D. Computational Science	Asst. Prof.	MYA	Fall 2022	9	0.75	0.25	0.19	9	0.75	0.25	0.19
A	Sravani Vadlamani, Ph.D. Data Science	Asst. Prof.	MYA	Fall 2022	9	0.75	0.25	0.19	9	0.75	0.25	0.19
B	New Hire, Ph.D. Data Science	Asst. Prof.	MYA	Fall 2024	0	0.00	0.00	0.00	9	0.75	0.50	0.38
C	New Hire, Ph.D. Computational Science or Rel.	Assoc. Prof.	MYA	Fall 2024	0	0.00	0.00	0.00	9	0.75	0.25	0.19
	New Hire, Degree Academic Discipline				0	0.00	0.00	0.00	0	0.00	0.00	0.00
	New Hire, Degree Academic Discipline				0	0.00	0.00	0.00	0	0.00	0.00	0.00
	New Hire, Degree Academic Discipline				0	0.00	0.00	0.00	0	0.00	0.00	0.00
Total Person-Years (PY)								0.75				1.31

Faculty Code	Code Description	Source of Funding	PY Workload by Budget Classification	
			Year 1	Year 5
A	Existing faculty on a regular line	Current Education & General Revenue	0.75	0.75
B	New faculty to be hired on a vacant line	Current Education & General Revenue	0.00	0.38
C	New faculty to be hired on a new line	New Education & General Revenue	0.00	0.19
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 regular/tenure-track line course load	Enterprise Auxiliary Funds	0.00	0.00
Overall Totals for			0.75	1.32

Worksheet Table 2 Faculty Participation

Note: Decimal Rounding in Pre-programmed Sheet accounts for 0.01 difference

**APPENDIX A
TABLE 3A (MS DS)
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)	90,703	0	0	0	0	0	0	\$90,703	167,189	0	0	0	0	0	\$167,189
Salaries and Benefits (A&P and USPS)	0	0	0	0	0	0	0	\$0	0	0	0	0	0	0	\$0
OPS (including assistantships & fellowships)	0	0	0	0	0	0	0	\$0	0	0	0	0	0	0	\$0
Programmatic Expenses****	0	0	0	0	0	0	0	\$0	0	0	0	0	0	0	\$0
Total Costs	\$90,703	\$0	\$0	\$0	\$0	\$0	\$0	\$90,703	\$167,189	\$0	\$0	\$0	\$0	\$0	\$167,189

*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)	0.75	1.31
FTE (A&P and USPS)	0	0

Calculated Cost per Student FTE

	Year 1	Year 5
Total E&G Funding	\$90,703	\$167,189
Annual Student FTE	8.5	28
E&G Cost per FTE	10670.9412	5971.03571

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 tuition and fees trust 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.

Note: TABLE 3B CONTINUING EDUCATION, SELF-SUPPORTING AND MARKET RATE PROGRAM BUDGET – NOT APPLICABLE

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)	1,318,310	90,703	\$1,227,607
	0	0	\$0
	0	0	\$0
	0	0	\$0
	0	0	\$0
	0	0	\$0
	0	0	\$0
	0	0	\$0
Totals	\$1,318,310	\$90,703	\$1,227,607
* If not reallocating E&G funds, please submit a zeroed Table 4			

Appendix B. Internal Letters

As noted in the proposal, Florida Poly's graduate programs are all collaborative delivered and managed by the Graduate Division Director in collaboration with the Provost and the Academic Department Chairs (GMT-Graduate Management Team) for departments that have tracks or programs within the degree. Presently, all programs are delivered with some degree of common courses and the addition of this program would not alter that arrangement. In fact, it has facilitated some greater collaboration and efficiencies in course delivery.

The Graduate Management Team is further supported by the Graduate Studies Committee, which reviews and recommends policy, curriculum, program assessment, other program documents, and conducts student progress reviews.

Appendix C. Faculty Curriculum Vitae

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 (AHPARC) 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 (AHPARC) 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 (ICCD 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 ℓ_1 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 Yashin 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).

Lizhen Shi

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Data Science
Florida Polytechnic University
4700 Research Way, Lakeland, FL 33812

EDUCATION

Florida State University Ph.D. in Computer Science (GPA: 4.0/4.0)	Tallahassee, FL Aug. 2020
Auburn University M.S. in Computer Science and Software Engineering (GPA: 4.0/4.0)	Auburn, AL Aug. 2015
North China Electric Power University B.S. in Computer Science	Baoding, China June 2007

RESEARCH INTERESTS

Data Science, Machine Learning, Big Data, Artificial Intelligence, Computational Biology, Image Processing, Natural Language Processing, Cloud Computing, Digital Forensics

PROFESSIONAL EXPERIENCE

Assistant Professor <i>Florida Polytechnic University</i>	01/2021 - Present Lakeland, FL
<ul style="list-style-type: none">• Research – Conduct research in Data Science field, publish papers, and obtain funding for research projects. Maintain professional relationships established with the Department.• Teaching – Instruct data science courses in compliance with department programs.• Service – Evaluate department programs and participate in committees.	
Kaggle Master <i>Kaggle</i>	08/2017 – 05/2020 Online
<ul style="list-style-type: none">• Participated in 16 predictive modeling competitions in a wide variety of domains hosted by companies and research institutes.• Competed with statisticians and data miners from all over the world, aiming for the best models.• Got 1 gold, 3 silver and 1 bronze medals.	

Research Assistant

08/2015 – 07/2020

Florida State University

Tallahassee, FL

- Built a generic tool for representing DNA sequence as a vector using word embedding in NLP and Locality Sensitive Hashing.
- Designed a hybrid clustering algorithm based on LPA for metagenomic read clustering
- Developed a scalable sequence clustering tool named SpaRC based on Apache Spark.
- Designed a cross-layer scheduler for improving DAG-structured query processing in MapReduce.

Summer Intern

05/2015 – 08/2015

Lawrence Berkeley National Lab

Berkeley, CA

- Upgraded BioPig toolkit from Hadoop 1 to Hadoop 2 (2.7.0).
- Tuned Hadoop parameters for optimizing the performance of BioPig.
- Implemented a new module called K-mer Similarity to extend the functionality of the BioPig toolkit.

Research Assistant

08/2014 – 05/2015

Auburn University

Auburn, AL

- Implemented an MPI program to sort millions of integers using multiple sorting algorithms.
- Developed an android project that supports downloading files from top cloud storage providers.

Software Engineer

06/2007 – 12/2012

PricewaterhouseCoopers, Kingbase

Beijing, China

- Developed new projects for new/existing business processes using C# and SQL server database.

PUBLICATIONS

Fernando Meyer, Adrian Fritz, [et al, including **Lizhen Shi**]. *Critical Assessment of Metagenome Interpretation - the second round of challenges*, Nature Methods, January 2022

Lizhen Shi, Bo Chen. *LSHvec: A Vector Representation of DNA Sequences Using Locality Sensitive Hashing and Word Embeddings*. ACMBCB'21: Proceedings of the 12th ACM International Conference on Bioinformatics, Computational Biology and Health Informatics, August 2021

Yakang Lu, **Lizhen Shi**, Marc W Van Goethem, Vokan Sevim, Michael Mascagni, Li Deng, Zhong Wang. *Hybrid Clustering of Long and Short-read for Improved Metagenome Assembly*. Frontiers in Microbiology (Minor Revision)

Lizhen Shi, Bo Chen. Comparison and Benchmark of Graph Clustering Algorithms. 05/2020, arXiv

- Kexue Li, Lili Wang, **Lizhen Shi**, Li Deng, Zhong Wang. *Deconvolute individual genomes from metagenome sequences through short read clustering*. PeerJ 8 (2020): e8966.
- Lizhen Shi**, Zhong Wang. *Computational Strategies for Scalable Genomics Analysis*. Genes 10.12 (2019): 1017.
- Lizhen Shi**, Xiandong Meng, Elizabeth Tseng, Michael Mascagni, Zhong Wang. *SpaRC: scalable sequence clustering using Apache Spark*. Bioinformatics 35.5 (2018): 760-768.
- Ji Huang, Stefania Vendramin, **Lizhen Shi**, Karen M McGinnis. *Construction and optimization of a large gene Co-expression network in maize using RNA-Seq data*. Plant physiology 175.1 (2017): 568-583.
- Lizhen Shi**, Zhong Wang, Weikuan Yu, Xiandong Meng. *A Case Study of Tuning MapReduce for Efficient Bioinformatics in the Cloud*. Parallel Computing 61 (2017): 83-95.
- Lizhen Shi**, Zhong Wang, Weikuan Yu, Xiandong Meng. *Performance Evaluation and Tuning of BioPig for Genomic Analysis*. Proceedings of the 2015 International Workshop on Data-Intensive Scalable Computing Systems. ACM, 2015.

INVITED TALKS AND PRESENTATIONS

- August 2021. LSHvec: A Vector Representation of DNA Sequences Using Locality Sensitive Hashing and Word Embeddings. **ACM-BCB 2021**: Proceedings of the 12th ACM International Conference on Bioinformatics, Computational Biology and Health Informatics,
- Dec 2020. "Scalable and Accurate Hybrid Clustering of Metagenomic Short and Long reads. **SFAF 2020**: Sequencing, Finishing and Analysis in the Future Meeting. Zoom
- Sep 2020. "A vector representation of DNA sequences using Locality Sensitive Hashing." National Institutes of Health (**NIH**)/ **NIDDK**, Zoom.
- Nov 2019. "A vector representation of DNA sequences using Locality Sensitive Hashing." **FSU CS expo**, Tallahassee, FL.
- Nov 2018. "SpaRC: scalable sequence clustering using Apache Spark." **FSU CS expo**, Tallahassee, FL.
- Nov 2015. "Performance Evaluation and Tuning of BioPig for Genomic Analysis." International Workshop on Data-Intensive Scalable Computing Systems (DISCS) in conjunction with the ACM/IEEE Supercomputing Conference (**SC'15**), Austin, TX.

DATA SCIENCE PROJECTS

Participated in 16 predictive modeling competitions on Kaggle and got rich hands-on experience on data-intensive analytics, machine learning, image processing, etc. The projects and my achieved ranks are listed below:

Project	Rank
• Web Traffic Time Series Forecasting	7/1095 (Top 1%)
• Santander Product Recommendation	20/1786 (Top 2%)
• Zillow Prize: Zillow's Home Value Prediction (Zestimate)	41/3775 (Top 2%)
• The Nature Conservancy Fisheries Monitoring	101/2293 (Top 5%)
• TensorFlow Speech Recognition Challenge	124/1314 (Top 10%)
• Melbourne University AES/MathWorks/NIH Seizure Prediction	101/478 (Top 22%)
• Outbrain Click Prediction	152/979 (Top 16%)
• Recruit Restaurant Visitor Forecasting	276/2157 (Top 13%)
• Predicting Molecular Properties	309/2749 (Top 12%)
• Google Cloud & YouTube-8M Video Understanding Challenge	375/655 (Top 58%)
• Two Sigma Financial Modeling Challenge	502/2066 (Top 25%)
• Bosch Production Line Performance	597/1373 (Top 44%)
• Corporación Favorita Grocery Sales Forecasting	929/1674 (Top 56%)
• Quora Question Pairs	1394/3304 (Top 43%)
• Mercedes-Benz Greener Manufacturing	1444/3831 (Top 38%)
• Personalized Medicine: Redefining Cancer Treatment	101/1386 (Top 8%)

TEACHING EXPERIENCE

Assistant Professor (Florida Polytechnic University)

- Data Wrangling and Exploratory Data Analysis (CAP 5320): Spring 2021, Spring 2022
- Data Warehousing (CAP 3774/5774): Spring 2021, Spring 2022
- Introduction to Programming Using Python (COP 2034): Spring 2022
- Introduction to Data Science (COP 2073): Spring 2021 (6 weeks)
- Topics in Big Data Analytics (CAP 4786): Fall 2021
- Computer Information Technology and Applications (CGS1100): Fall 2021

Instructor (Florida State University)

- Microcomputer Applications for Business and Economics (CGS 2100): Spring 2020
- Computer Fluency (CGS 2060): Spring 2020, Summer 2019

- Java for Non-Majors (CGS 3416): Fall 2019, Spring 2019

HONORS / AWARDS

Second Place in CS expo presentation, FSU 2019
Second Place in CS expo presentation, FSU 2018
Best Employee Award, Kingbase 2009
Second Place on campus singing competition, NCEPU 2006

SERVICE

DSBA Academic Review Board (ARB) panel, Florida Poly Spring 2022
DSBA-CS Thesis and Graduate Project Review and Approval Committee, Florida Poly 2021, 2022
DSBA-CS Faculty Search Committee Member, Florida Poly 2021, 2022
Reviewer, Computers in Biology and Medicine
Reviewer, Journal of RNA and Genomics
Reviewer, Recent patents on computer science
Reviewer, IEEE/ACM Transactions on Computational Biology and Bioinformatics
Reviewer, IEEE Access

PROFILES

GitHub Profile: <https://github.com/Lizhen0909>
Bitbucket Profile: <https://bitbucket.org/LizhenShi/>
Kaggle Profile: <https://www.kaggle.com/lzs0047>
Google Scholar Profile: <https://scholar.google.com/citations?user=ktSEFaoAAAAJ&hl=en>

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LinkedIn Page: www.linkedin.com/in/sravanivadlamani

EDUCATION

- Ph.D., Civil Engineering, July 2018 (Advisor: Dr. Yingyan Lou)
 - Arizona State University, Tempe, AZ, USA
 - Dissertation Topic: HOT Lanes with a Refund Option
 - Priced Managed Lanes (MLs) have been increasingly advocated as one of the effective ways to mitigate traffic congestion. Despite their prevalence in the US, the public opposition towards MLs can be boosted by innovative pricing strategies. An alternative pricing strategy is proposed and the travelers' attitudes and concerns towards this strategy is investigated. The implementation issues along with the potential of using CVs to help achieve the vision are also discussed.
 - Certificate in Statistics, December 2014
 - Arizona State University, Tempe, AZ, USA
 - Master's in Geographic Information Systems (GIS), August, 2013
 - Arizona State University, Tempe, AZ, USA
 - Master's in Civil Engineering, May, 2010 (Advisor: Dr. Soyoung Ahn)
 - Arizona State University, Tempe, AZ, USA
 - B.S., Civil Engineering, 2007
 - Jawaharlal Nehru Technological University, Hyderabad, India
-

WORK EXPERIENCE

- **Assistant Professor** August 2018 - present
Department of Data Science & Business Analytics, Florida Polytechnic University, Lakeland, FL
 - **Graduate Research Associate** May 2014 – July 2018
School of Sustainable Engineering and the Built Environment, Arizona State University, Tempe, AZ
 - **Research Aide** August 2012- May 2014
Global Decision Theater Alliance, Arizona State University, Tempe, AZ
 - **Transportation Engineer II** December 2010-August 2012
Maryland State Highway Administration (SHA), Annapolis, MD
 - **Graduate Research Assistant** January 2008-May 2010
School of Sustainable Engineering and the Built Environment, Arizona State University, Tempe, AZ
-

TEACHING EXPERIENCE

At Florida Polytechnic University

- ❑ STA 2023: Statistics I (Fall 2018, 2019, 2020, 2021; Spring 2019, 2020, 2021)
 - Taught every semester, this course covers descriptive statistics, probability and hypothesis testing for inference. As a course coordinator and instructor, developed the course lectures, assignments, final project and exams.
- ❑ IDC 4942: Data Analytics Capstone I and IDC 4943: Data Analytics Capstone II (Fall 2019, 2020; Spring 2020, 2021)
 - A two-part senior capstone course where I oversee various teams working on industry sponsored projects in applied data science and business analytics.
 - Provide a refresher of major fundamental concepts relevant to their project including a primer on statistics, data visualization, data analytics and management.
 - Organized guest lectures on effective writing and communication techniques, guidance on career & professional services and idea & elevator pitching to a general audience.
- ❑ TRA 4945C: Science & Technology Capstone 1 and TRA 4946C: Science & Technology Capstone 2 (Fall 2018 and Spring 2019)
 - A two-part senior capstone course where I supervised 4 teams working on an industry sponsored project
- ❑ EGN 1007: Concepts & Methods for Engineers (Spring 2019)
 - Reinforced knowledge of the research process through focused study of key interdisciplinary topics using technical tools and scientific software.
- ❑ ESI 4011: Data Analytics for Smart Cities & Transportation (Fall 2019)
 - Developed the course from writing course objectives and learning outcomes, prepared course material including lectures, assignments and projects.
 - Organized guest lectures and field trips to SunTrax facility.
 - Focused on design strategies, simulation techniques and data analytics to understand the needs and requirements of future smart cities.
- ❑ ESI 4513: Intelligent Mobility (Spring 2020, 2021)
 - Developed the new course including all course material and organized guest lectures and field trips.
 - Familiarize students with intelligent transport systems to enhance mobility and understand technologies critical for functioning and implementation of connected and autonomous vehicles.
- ❑ QMB 3200: Advanced Quantitative Methods (Fall 2020, 2021)
 - Delivered this class in a hybrid format during the pandemic in Fall 2020.
 - Developed and assigned course material that varied in complexity based on the student's learning needs.
- ❑ STA3241: Statistical Learning (Fall 2021)
 - Covered 6 weeks of class including topics on regression, classification and decision trees.
- ❑ MAN 3520: Six Sigma (Fall 2021)
 - Redesigned the curriculum and organized guest lectures.
 - Focused on DMAIC and DMAIV techniques for process improvement.

At Arizona State University

- ❑ CEE 372: Introduction to Transportation Engineering (Spring 2018)
 - As a teaching assistant, prepared quizzes, graded quiz and homework, prepared homework solutions and maintained the course website.
- ❑ CEE 372: Introduction to Transportation Engineering (Fall 2017)
 - As a teaching assistant, handled the administrative portion of the course including maintaining grades and attendance records. Covered the classes when the instructor was not available.
- ❑ CEE 598: Transportation Demand and Network Modeling (Spring 2015)
 - Involved in teaching the laboratory portion of the course that included training students in the use of various statistical and econometric analysis tools including SPSS, LIMDEP and NLOGIT for modeling travel behavior.
- ❑ National Summer Transportation Institute (NSTI) (Summer 2010)
 - Developed and facilitated a curriculum for 50 high school students to introduce concepts of engineering with a focus on transportation/traffic engineering and fundamentals of MATLAB.
- ❑ CEE 372: Introduction to Transportation Engineering (Fall 2009)
 - Served as a teaching assistant and covered the basics of transportation engineering including traffic dynamics, horizontal and vertical curves, basic road safety principles and introduction to four step travel demand model.

Outside University

Personal Tutoring

- Tutored graduate students in Geographic Information Systems (GIS)
- Tutored elementary and high school students in Math and Science.

RESEARCH PROJECTS AT FL POLY

- ❑ **Attitudes Towards Innovative Pricing Options for Managed Lanes**
 - Utilized unsupervised learning approach to understand attitudes towards a possible refund option for priced managed lanes.
- ❑ **Analysis of Truck Crashes in Inclement Weather using Advanced Data Mining Techniques**
 - Identify contributors to truck crashes in inclement weather using Multiple Correspondence Analysis (MCS), clustering and association rules.
- ❑ **State Marijuana Laws and Traffic Fatalities**
 - Examined the relation between traffic fatalities and state marijuana laws characterized by permissiveness, dispensary provisions and adult recreational use via statistical models in STATA.
- ❑ **A Study of the Impact of Florida's Charter Schools**
 - Involved in data collection and processing to create a database of charter and non-charter schools

in FL including information about student and school performance, teacher statistic etc.

RESEARCH PROJECTS AT ASU

❑ **HOT Lanes with a Refund Option**

- Lead student researcher involved in the analysis of stated preference data to investigate travelers' attitudes toward a possible refund option of priced managed lanes with structural equation and multinomial logit models using MPlus and NLogit.

❑ **Prioritizing Emissions Mitigation Strategies at the Mariposa Port of Entry**

- Assessed vehicle movement within and near the port and developed a robust emissions inventory using high fidelity vehicle trajectory information using VISSIM.
- Proposed emissions reduction strategies through a variety of infrastructural, technological and fuel options.

❑ **ABOR Research Innovation Fund – Operational Safety and Efficiency on I-10 Freight Corridor**

- Identified and reviewed new operational concepts and technologies for both corridor and fleet management.
- Investigated the potential of new technologies to improve safety, operations performance (infrastructure, congestion, etc.) and efficiency of the corridor. Identified issues related to truck parking and rest areas.

❑ **The Potential of Employing Connected Vehicle Technologies for Demand Management of Managed Lane Facilities**

- This project aims to shed light on the implication of employing connected vehicle technologies for managed lanes demand management by providing richer, real-time and relevant information.
- Determination of the minimal market penetration rate (MPR) required to make the system work.

❑ **MapStory**

A crowdsourcing project aimed to organize humanity's shared knowledge of how the world evolved geographically over time.

- Lead a team of five to create MapStories using ArcGIS for a better understanding of the global dynamics over time.
- Proficient with creating, editing, maintaining and updating geospatial and tabular data including shapefiles, geodatabases and features using ArcGIS 10.x
- Produced accurate maps as per cartographic requirements including projection, coordinate system and datum. Utilized the application of LIDAR productions and analytics
- Developed models using Model Builder and other geoprocessing tools and a web application using Python, JavaScript and Google API.

❑ **Countermeasures to Reduce Large Truck Crashes, Arizona Department of Transportation**

- Processed accident data and identified hot spots for truck crashes using negative binomial regression.
- Investigated the contributing factors after site visit and recommended potential countermeasures

❑ **Macroscopic and Microscopic Analysis of Traffic Hysteresis**

- Macroscopically, analyzed the statistical difference between flow-density relationships during acceleration and deceleration for aggregated data of vehicles using NGSIM data and MATLAB.
 - Examined speed-spacing relationships for randomly chosen individual pair of trajectories
-

PROPOSAL EFFORTS

❑ **Multifaceted Education for Creating Engineering Awareness among Middle and High School Girls**

- Obtained a \$15,000 grant to organize a summer workshop to stimulate the interest of middle and high school girls to pursue a career in STEM

❑ **Design and Development of Metal Chelating Agents for a Sustainable Rare Earth Elements Recovery and Extraction Process using CO₂ Solvent**

- Comparison of the proposed vs. traditional approaches using Life Cycle Analysis (LCA)

❑ **Excel Female Engineers: Hands-on Introduction to Engineering**

- Outreach activities to stimulate the interest of middle school children to pursue a career in STEM

❑ **Testing of Connected and Autonomous Vehicles Through Scenario Generation using AVSGS**

- Proposed the development of a simulator to generate edge cases to evaluate the performance of a Connected and Autonomous Vehicle (CAV).
- Focused on analyzing the accident data to generate scenarios for testing in the simulator.

❑ **A Study of the Impacts of Florida's Charter Schools: School Finance, Resource Allocation, and Student Outcomes**

- Involved in data collection and processing to create a database of charter and non-charter schools in FL including information about student and school performance, teacher statistic etc.

❑ **Innovative and Integrated Solutions for Arizona Wrong-Way Driving Detection and Warning**

- Investigated both existing and innovative solutions for wrong way detection and warning.
- Focused on deployment, technical and assessment challenges in possible implementation of wrong way detection and warning systems.

❑ **Reducing Secondary Crashes through Effective Traffic Incident Management**

- Investigated existing literature on secondary crashes and the need to address this issue.
 - Our portion included data collection including identification of any existing data and statistical analysis to confirm the statistical significance of relevant variables.
-

PROFESSIONAL EXPERIENCE

Maryland State Highway Administration (SHA)

- ❑ Collaborated directly with members of public, police, other governmental agencies, civic groups, and business associations regarding traffic related issues along state maintained roadways.
- ❑ Prepared Memorandum of Action (MOA) to establish a local traffic law on state roadways.
- ❑ Analyzed the annual high accident intersections and sections for probable causes after site visits and recommend potential countermeasures for accident mitigation.
- ❑ Reviewed traffic impact studies and traffic control plans for new residential and commercial developments.

- ❑ Conducted traffic engineering analyses including speed studies, sight distance review, signing & marking review and recommend alternative solutions that improve safety, capacity and traffic operations.
 - ❑ Followed up customer concerns and prepared correspondence for signature of higher officials.
-

PUBLICATIONS IN REFEREED JOURNALS

1. Dewey, J, Kindle, K, **Vadlamani, S**, and Sanchez-Arias, R. (2021). State Marijuana Laws and Traffic Fatalities. In Print at *The Review of Regional Studies*.
 2. Reyna, J, **Vadlamani, S**, Chester, M, and Lou, Y. (2016). Reducing Emissions at Land Border Crossings through Queue Reduction and Expedited Security Processing. *Transportation Research Part D, Volume 49*, 219-230.
 3. Ahn, S, **Vadlamani, S**, and Laval, J. (2013). A method to Account for Non-Steady Conditions in Measuring Traffic Hysteresis. *Transportation Research Part C, Volume 34*, 138-147.
 4. **Vadlamani, S**, Chen, E, Ahn, S, and Washington S. (2011). Identifying Large Truck Hot Spots Using Crash Counts and PDOEs. *ASCE Journal of Transportation Engineering, Volume 137, Issue 1. Journal of the Transportation Research Board*, 2156, 111-119.
-

PUBLICATIONS IN REVIEW

1. **Vadlamani, S**, Archer, M and Lou, Y. HOT Lanes with a Refund Option, Part I: An Exploratory Analysis of Travelers' Interest.
 2. **Vadlamani, S**, and Lou, Y. HOT Lanes with a Refund Option, Part II: Choice Models Incorporating Travelers' Attitudes.
-

PUBLICATIONS IN REPORTS

1. Ahn, S, Zheng, Z, and **Vadlamani, S**, (2015). Private Road Transport – Cars and Trucks. *106th Arizona Town Hall Report*.
 2. Ahn, S, Zheng, Z, and **Vadlamani, S**, (2009). Highway Travel and Congestion. *94th Arizona Town Hall Report*.
-

WORKING PAPERS

1. Sanchez-Arias., R, **Vadlamani, S**, and Lou,Y “An Unsupervised Learning Approach to Understand Attitudes Towards Innovative Pricing Options for Managed Lanes”.
 2. Nelson, M, **Vadlamani, S**, “Analysis of Truck Crashes in Florida using Unsupervised Data Mining Techniques”.
 3. **Vadlamani, S**, Sanchez-Arias., R, “Truck Crash Analysis using Advanced Data Mining Techniques”.
-

CONFERENCE PRESENTATIONS

1. Nikhil Menon., Sravani Vadlamani, “An Empirical Assessment of Autonomous Vehicle Usage Incorporating Latent Effects” Accepted for Presentation at the 7th Annual UTC Conference for the Southeastern Region (This conference did not take place due to COVID-19)
2. Sanchez-Arias., R, **Vadlamani, S**, and Lou,Y “Attitudes toward HOT Lanes Using Dimensionality Reduction and Clustering” Presented at the 99th Annual Meeting of the Transportation Research

- Board (TRB) in Washington D.C. from January 12 – 16, 2020. Paper# 20-05389
3. **Vadlamani, S**, and Lou, Y. Potential ITS Countermeasures to Address Freight Safety and Operations Issues. AZ ITE/IMSA Spring Conference, February 28-March 1, 2018.
 4. **Vadlamani, S**, and Lou, Y. Attitudes toward HOT Lanes with a Refund Option. *96th Transportation Research Board Annual Meeting*, Washington, D.C. January 8-12, 2017.
 5. Reyna, J, **Vadlamani, S**, Chester, M, and Lou, Reducing Emissions at Land Border Crossings through Queue Reduction and Expedited Security Processing. *95th Transportation Research Board Annual Meeting*, Washington, D.C. January 10-14, 2016.
 6. Lou, Y, **Vadlamani, S**, and Archer, M. HOT Lanes with a Refund Option – A Stated Preference Survey of the Phoenix Metropolitan Area. *95th Transportation Research Board Annual Meeting*, Washington, D.C. January 10-14, 2016.
 7. Reyna, J, **Vadlamani, S**, Chester, M, and Lou, Prioritizing Emissions Mitigation Strategies at the Mariposa Port of Entry, ITS Arizona Conference, March 1-3, 2016.
 8. Reyna, J, **Vadlamani, S**, Chester, M, and Lou, Prioritizing Emissions Mitigation Strategies at the Mariposa Port of Entry, AZ ITE/IMSA Spring Conference, February 24-26, 2015.
 9. **Vadlamani, S**, Chen, E, Ahn, S, and Washington S. Identifying Large Truck Hot Spots Using Crash Counts and PDOEs. *89th Transportation Research Board Annual Meeting*, Washington, D.C. January 10-14, 2009.
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SERVICE

- Dissertation/Project
 - Michael Nelson (Master's Thesis Committee Chair)
 - Lina Hashem (Master's Project Advisor)
 - Anita Silwal (Master's Project Advisor)
 - Jonathan Ferrer (Master's Project Committee Member)
 - Statistics Course Coordinator, Fall 2020-Present
 - Member of Undergraduate Curriculum Committee 2021 - present
 - Member of Curriculum & Assessment Committee 2018 – Present
 - Member of Environmental Engineering Search Committee 2019-2020
 - Member of Computer Science Search Committee (2 committees) 2018-2019
 - Member of DSBA Search Committee 2019-2020
 - Designed a brochure for the Data Science & Business Analytics Department at Florida Polytechnic University which is extensively being used for programs marketing.
 - Participated in a two-week training for Hacking for Defense (H4D) organized by Department of Defense (DoD) in Summer 2020.
 - Member of ABLAZE Awards Committee Fall 2018
 - Member of ABLAZE Teaching Awards Review Committee Spring 2019
 - Member of Parking Committee 2018-Present
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RESEARCH INTERESTS

- Application of Geographic Information Systems (GIS) in Transportation
- Data Mining & Analysis in Civil Engineering

- ❑ Application of Data Mining in Transportation
 - ❑ Transportation Safety
 - ❑ Travel Behavior and Travel Demand Modeling and Forecasting
 - ❑ Transportation Operations and Traffic Simulation
 - ❑ Transportation Planning
 - ❑ Statistical and Econometric Modeling Techniques
-

TEACHING INTERESTS

- ❑ Undergraduate: Introduction to Transportation Engineering, Numerical Methods, Probability and Statistics, Courses in Civil Engineering and GIS
 - ❑ Graduate: Quantitative Methods, Data Mining, Transportation Operations, Transportation Safety, Travel Behavior, Public Transportation, Transportation Planning, Transportation Demand Modeling, Statistical and Econometric Methods in Civil Engineering, Geographic Information Systems (GIS).
-

AWARDS AND ACCOMPLISHMENTS

- ❑ Recipient of Jenny L. Grote Student Leadership Award by the Arizona Section of the Institute of Transportation Engineers (2017-18)
 - ❑ Passed the Professional Engineer (PE) exam in April 2017.
 - ❑ Engineer-In-Training (EIT) from the Arizona State Board of Technical Registration.
 - ❑ Winner of "ITE Arizona Paper Presentation Contest" in 2009.
 - ❑ Winner of "ITE Arizona Paper Presentation Contest" in 2010.
 - ❑ Completed "AASHTO Roadside Design Guide" course from National Highway Institute.
 - ❑ Awarded a \$950 **travel grant** to attend the Transportation Research Board Annual Meeting in 2018, 2017 and 2016.
-

PROFESSIONAL AFFILIATIONS

- ❑ Reviewer for the journal of International Association of Traffic and Safety Sciences (IATSS)
 - ❑ Reviewer for the Journal of Transportation Safety & Security
 - ❑ Reviewer for Transportation Research Board Annual Meeting
 - ❑ Member of Polk Vision Smart Communities
 - ❑ Member of Congestion Pricing Committee (part of Managed Lanes Committee at TRB) (Fall 2019)
 - ❑ Member, Tau Beta Pi – The Engineering Honor Society
 - ❑ Member, American Society of Civil Engineers (ASCE)
 - ❑ Member, Association of American Transportation Professional of Indian Origin (ATPIO)
 - ❑ Graduate & Professional Student Association (GPSA), Arizona State University
 - Vice President of Internal Affairs (2017-2018)
 - Managed **seven** travel and research grants from application submission, review to decision-making and disbursement of funds with a budget of approximately \$500,000.
 - Oversaw a team of **two** directors and chaired a committee.
 - Recruited, trained and managed 300 reviewers.
 - Conducted informational sessions and advertised the grant options to students.
 - Director of Travel (2016-2017)
 - Responsible for the execution of the travel grant program with a budget of \$350,000.
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- Recruited, trained and managed 200 reviewers.
 - Informed and promoted the grant options to students, compiled reports, announced winners and provided feedback to applicants that were declined funding.
 - Institute of Transportation Engineers Student Chapter at Arizona State University
 - President (2014-2016)
 - Conducted student leadership and general body meetings.
 - Organized seminars, guest lectures and field trips.
 - Wrote articles and annual reports.
 - Secretary (2012-2014)
 - Maintained the website and records of meeting minutes.
 - Vice-President (2008-2010)
 - Handled the logistics of event organization from room reservation to dissemination of information to the entire student body.
-

TECHNICAL SKILLS

Programming languages: Python, C, JavaScript

Data Analysis Tools: LIMDEP, SPSS, SAS, MATLAB, MINITAB, R, MPlus

Mapping Tools: ArcGIS, QGIS

Transportation Software: VISSIM, SYNCHRO, MicroStation, HCS, TransCAD

**Florida Polytechnic University
Board of Trustees
Academic & Student Affairs Committee
February 9, 2022**

Subject: Master of Science Degree: "Engineering Management"

Proposed Committee Action

Recommend approval of the Master of Science Degree: "Engineering Management" to the Board of Trustees.

Background Information

The proposed Master of Science in Engineering Management comes out of the University's existing Master of Science in Engineering program where it is currently one of five tracks offered within the degree. The program provides a foundation in broad business skills, analytics for decision-making, and leverages students' engineering backgrounds to turn them into leaders in their fields. The program is 30 credits with an optional track in Transportation Analytics. The program does not rely on new resources since it is already offered within the University's existing faculty and curricular programs. The program will be delivered as a "less-than-one" year master's degree (10-months) culminating in a project-based seminar. Project costs for the program reflect the cumulative portion of department faculty time dedicated to the program with one planned hire for fall 2022 who will broadly support department degree programs.

In addition to the Data Science and Business Analytics bachelor's degrees, the department also offers tracks in Data Science and Engineering Management in our current master's degrees. The department also offers certificates in Entrepreneurship and an entry-level certificate offered to freshman—Coding for Data Analytics. By breaking out engineering management from its status as a track to a standalone degree, there becomes greater opportunity to adapt curriculum to address industry needs while also firmly defining our existing Master of Science in Engineering as a technical-based master's degree.

Supporting Documentation: Request for Degree Program: MS Engineering Management

Prepared by: Dr. Terry Parker, EVP & Provost



**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 2022
Proposed Implementation Term

Name of College(s) or School(s)

Department of Data Science & Business Analytics
Name of Department(s)/Division(s)

Engineering Management
Academic Specialty or Field

Master of Science in Engineering Management
Complete Name of Degree

15.1501
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

M. Ave 2/7/2022
President's Signature Date

Board of Trustees Chair's Signature Date

[Signature] 2/07/2022
Provost's Signature Date

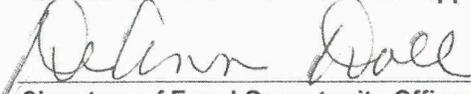
PROJECTED ENROLLMENTS AND PROGRAM COSTS

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	12	6.3	\$21,960.79	\$138,353	0	0	\$138,353
Year 2	20	10.7					
Year 3	28	16.9					
Year 4	35	22.5					
Year 5	40	27.7	\$6,177.65	\$170,812	0	0	\$170,812

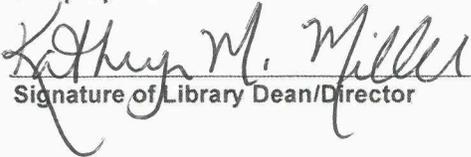
Additional Required Signatures

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


Signature of Equal Opportunity Officer

2-7-22
Date

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


Signature of Library Dean/Director

2-7-2022
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)

The proposed Master of Science in Engineering Management comes out of the University's existing Master of Science in Engineering program where it is currently one of five tracks offered within the degree. The program provides a foundation in broad business skills, analytics for decision-making, and leverages students' engineering backgrounds to turn them into leaders in their fields. The program is 30 credits with an optional track in Transportation Analytics. The program does not rely on new resources since it is already offered within the University's existing faculty and curricular programs. The program will be delivered as a "less-than-one" year master's degree culminating in a project-based seminar

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 master's degree in Engineering Management supports the SUS Strategic plan 2025 Goals for the state universities by

- Increasing the number of degrees awarded in an area of strategic emphasis
- Increase commercialization activity
- Strengthen the quality and recognition of commitment to community and business engagement

The program lies squarely within the mission of Florida Polytechnic University to “serve students and industry through excellence in education, discovery, and application of engineering and applied sciences.” Engineering Management provides an avenue for students wishing to broaden their engineering backgrounds for advancement as business and industry leaders. The program further supports the University's strategic plan priorities around degree alignment and growing the graduate program in STEM and STEM-related fields. The master's in engineering management delivers at the graduate level a focus on global marketplace and the application of engineering and related technologies to improve the quality of communities, the state, the nation and the world.

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**

The Department of Data Science and Business Analytics at Florida Poly has offered the Engineering Management track in the Master of Science in Engineering since Spring 2020. The program has grown to 15 students annually, but its status as a track-only holds it back from strong marketing and enrollment possibilities. The Department of Data Science and Business Analytics would offer the program, where the track currently resides.

Engineering Management at Florida Poly integrates coursework in Data Analytics that enhances better informed decision making in organizations. The program also leverages existing strength in the Computer Science Department and in the Data Science track within the Master of Science in Computer Science to create a cross-fertilized, efficient curriculum delivery model and manage student loads with efficient student credit hour production.

The Department also has strategic industry partnerships that serve as a curriculum advisory board for the department's programs. The MS in Engineering Management would be included under the Advisory Board's umbrella for review.

As it is already an existing track, no essential coursework must be developed, nor are any new faculty needed at this time to implement the program and get it through its first few years of operation as a standalone degree.

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.

The program pre-proposal was presented to the CAVP-ACG on November 9, 2021. No concerns were raised.

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.**
- 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.**

Development of future programs begins at the Department Chair, Provost, and President levels in a long-term planning effort that get represented on the University's Accountability Plan. Florida Poly strives to "build-out" a suite of core and cutting-edge engineering programs at the bachelor's levels with graduate degrees that naturally come from these fields and can be supported by existing resources. The University's method at both undergraduate and graduate levels includes concentrations (undergrad) or tracks (graduate), which serve as "incubators" for program development and testing grounds for demand. Based on these as well as perceived and evidenced opportunity, the University moves these programs forward on the accountability plan. As an example of this decision-making changing based on these criteria, a review of our recent APs shows a change from a potential MS in Business Analytics to the proposal in Engineering Management and one in Data Science. These areas both develop more naturally out of our existing faculty and offerings, connect more directly to our stakeholders' interests, and are closer to our core mission. Programs then move forward through the Chairs, are discussed and developed within the department, then go through established University curricular processes.

Planning Process

Date	Participants	Planning Activity Description
Fall 2019	Shahram Taj, Department Chair Tom Dvorske, Vice Provost- Graduate Division, Graduate Studies Committee	Program changes delineating construct for Engineering tracks including EM. New courses proposed/added.
Spring 2020	DSBA Department	Launches EM track in the MS in Engineering – 6 students admitted
April 30, 2020	Terry Parker, Provost	BOT Accountability Plan Approval
May and July 2020	Randy Avent, President	BOG Accountability Plan Approval
April 20, 2021	Terry Parker, Provost	BOT Accountability Plan Approval
June 23, 2021	Randy Avent, President	BOG Accountability Plan Approval
August 2021	Shahram Taj, DSBA Chair	Initial cohort in EM 10-month path
Fall 2021	Shahram Taj, Department Chair Tom Dvorske, Vice Provost- Graduate Division Graduate Studies Committee	Realignment of course offerings, formalization of 10-month, 16-month, and 2-year thesis paths in each degree program (& track). Three-year course offerings outlined. New courses approved for upcoming Academic Year.
10/14/2021	Dr. Tom Dvorske, Dr. Shahram Taj	Structure of program curriculum discussion and pre-proposal draft preparation
10/20/2021	Dr. Shahram Taj	DSBA Department comments and input regarding the pre-proposal submission
10/22/2021	Dr. Shahram Taj, Dr. Rei Sanchez- Arias, Ms. Orel Yoshia	Finalize pre-proposal draft and submit to Dr. Dvorske for input
10/25/2021	Dr. Shahram Taj, Dr. Rei Sanchez- Arias, Ms. Orel Yoshia, Dr. Tom Dvorske	Discussion of pre-proposal document for submission
Nov 9, 2021	Tom Dvorske, Vice Provost	CAVP-ACG Review
Jan-Feb 2022	Graduate Studies Committee	Formal curriculum review and 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

The following table assumes approval and inclusion in the Inventory by June 2022

Date	Implementation Activity
Jun 2022	Updated letter to Engr Management Track students that they may now opt for the MS in Engineering Management (courses remain the same on the plan of study regardless).
	Update Graduate Catalog and Student Handbook and University Website to reflect new Degree program.
	Begin announcements in anticipation of new recruiting cycle for Fall 2023.
August 2022	Graduate Division Student Orientation Since courses are already scheduled as part of EM track, no registration changes need be made.
Fall – Winter 2022	Development of transportation courses and track within the 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**

[The U.S. Bureau of Labor Statistics](#) projects that employment of engineering managers is projected to grow 4 percent from 2020 to 2030, slower than the average for all occupations. Despite limited employment growth, about 14,700 openings for engineering managers are projected each year, on average, over the decade. The average annual wage for engineering managers is \$149,530.

In Florida, Occupational Data shows an average growth of 4.85% over a two-year period (2019-2021) in SOCs associated with Engineering Management CIP code for more than 2500 job openings.

Graduates of the program will have ample opportunities in the growing and emerging high-tech industries in Florida, including but not limited to Logistics, Supply Chain, Distribution, Manufacturing, and Health Care.

Graduates will be well-prepared to address current and future needs locally and world-wide. Our graduating students are being offered positions in emerging high-tech medical device manufacturing in the State of Florida.

The Secretary of the Florida Department of Transportation has discussed with President Avent the possibility of developing a program or tracks in transportation to include management, analytics, and autonomous technologies. Approval of this program, along with Data Science (together or separately) will initiate the ability of the University to add coursework at this level (already present at the undergraduate level).

Florida Poly will play a crucial role in keeping good paying jobs in Florida by preparing the students equipped with knowledge of new technology, developing the technologies in collaboration with local industry and academic partners, and working with local communities and governments to facilitate healthy, educated relationships with industry to seek win-win solutions.

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

In the Master of Science in Engineering Management program, students will learn to direct, plan, and coordinate activities, as well as spend time supervising employees in engineering companies. They are responsible for developing the overall concepts of new products and/or solving problems that may prevent its completion. The program focuses on working with emerging technologies, product development, and program management.

Student demand is strongly supported by the current and prior interest of students, and graduate applications to the MS in Engineering, Engineering Management track. Overall, we anticipate interest from two broadly defined populations – existing and recent engineering undergraduates (at Poly or elsewhere) who wish to accelerate their career track through a complementary discipline master’s degree. The second group is working professionals. This latter population we expect to attract to the program in a few years as we formalize our delivery structure and explore additional options for flexible delivery.

Florida Poly maintained a steady growth in enrollments in the MS Engineering—Engineering Management track since it began in 2020. The initial program started with six students and has continued to grow. In this academic year, three students graduated from the MS Engineering Management-track in December 2021 and fourteen continue in the program on pace, with seven expected to graduate in spring/summer 2022. Three new students started in spring 2022 (off-cycle), and applications for fall 2022 are up for this track by 80% (18/10). Since it was implemented, thirty-four (34) students have graduated from the Engineering Management track.

We believe that by converting this track to a separate MSEM degree, we can grow the enrollment through more specific marketing and curricular opportunities that will attract more students, currently not available to a single track within a degree.

This degree is planned for face-to-face delivery, with less than 50% online. We anticipate two separate groups of potential students; the first group are working professional engineers who want to obtain a graduate degree in Engineering Management as opposed to an MBA. The second group are recent Florida Poly graduates in Science and Engineering who wish to obtain a graduate technical degree in management that complements their STEM training and industry internship experience.

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 and targets are as follows, noting the 10-month program timeframe:

YEAR	2022-2023	2023-2024	2024-2025	2025-2026	2026-2027
FTE	6.3	10.7	16.9	22.5	27.65
Headcount	10	20	28	35	40

Initial enrollment projections for year one, as indicated by this table, are actually lower than expectations based on the demand analysis. This is a conservative positioning as our recruiting typically lags into late spring. Over time, we believe a forty-student cohort is achievable and desirable for this program under existing resources and by maintaining a predominately residential delivery mode. While the program is designed to be completed in 10-months, experience tells us that around 30 - 40% over time will drop to part-time status, finishing in the subsequent fall rather than in the summer. Our total graduate degree production, with existing and proposed master's programs included, should rise reliably over the next five years.

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.

Qualitatively—The addition of an Engineering Management master's degree is a key addition to the program mix both expected from a STEM-engineering institution and a long sought-after graduate degree on top of an undergraduate engineering degree. Students who wish to focus their careers more on the business-side of engineering, but still need the core engineering foundation finds this program serves them well and carries a specificity not found in an MBA. Moreover, Florida Poly has no near-term plans to launch a business school. Offering an Engineering Management master's degree is a low-cost, low-resource, and high-quality competitive way of delivering a program that has been quickly showing demand based on enrollments and graduates.

To that point, there is an increasing interest in graduate training in engineering management by recent undergraduates in a wide range of science and engineering disciplines, who aim to gain training in business management discipline combining their other technical and analytical training. Additionally, due to the technology and analytics focus of the proposed program, it is anticipated that working professionals in industries that aim to harness the power of analytics become interested in this program.

The current MS in Engineering, Engineering Management Track has been completed by 34 students, who in addition to engineering firms have gone to work in information technology and healthcare industries. We anticipate that our MS Engineering Management graduates will find similar placements.

Salary.com, Indeed.com, and other sites typically show engineering managers earning between \$100 – 150 thousand in annual salary. The University presently leads the system in average salary for baccalaureate level graduates.

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.

SUS Institutions

Current programs at the MS-level in the system include programs at FIU, UCF, and USF. These programs also share the same CIP code as our proposed program. Program content is similar in nature to the proposed program, although not exact. As an engineering-focused and STEM only institution, a program in Engineering Management at the graduate level is a reasonable expectation of prospects and commensurate with peer institutions and aspirational peers. In order for Florida Poly to be competitive nationally, programs such as this are critical to its growth. Communication related to the implementation of our program has been shared with these institutions. As noted in this document, some of our faculty currently collaborate with faculty at USF and UCF on related areas. We also work with UCF and USF on a future-faculty program where their doctoral students have opportunities to teach at Florida Poly as part of a career development program. One recent UCF graduate who went through this program is a tentative hire for a position at the Assistant Professor level.

Florida-Private

Of the private colleges and universities in Florida, only Florida Institute of Technology, Embry-Riddle, and Polytechnic University of Puerto Rico have master's degrees in Engineering Management. These curricula bear similarity to our proposed program but tend to be heavier on business than in technical areas. We have not reached out to these institutions to discuss impact or collaborations. Moreover, the cost of these institutions makes it unreachable for a lot of Florida residents. Our program provides the advantage they need in a low-cost, high-quality, fast-paced program.

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.

Communications describing the University's proposed program were sent to Deans at FAMU and FIU on 2/1/2022.

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)

Admissions

Admission to the Graduate Division and programs at Florida Poly is a selective, multi-step process beginning with initial screening in the Office of Admissions, followed by review and decision at the academic department (program) level. Factors considered in making admissions decisions include, but may not be limited to, the following:

- (a) The quality of the applicant's undergraduate and/or graduate work done at all previous institutions attended;
- (b) Undergraduate and/or graduate grade point averages, and performance in specific major-related courses;
- (c) Scores on standardized admission tests;
- (d) The motivation and attitude of the applicant as determined by the applicant's personal statement, letters of reference and/or a personal interview or other means.

Florida Poly regulation [FPU-2.008](#) Graduate Admissions details this and other related information.

Typically, undergraduate GPA must be a 3.25 or better or, where lower, a GRE score may suffice to bridge the gap. Departments closely examine students' technical background and capability of working independently, conducting research, and evaluate reference letters.

Graduation

Graduates must complete the 30 credit program with a GPA of 3.0 or better and at least 2/3 of the credits applied toward the degree must come from the University. Other specific requirements may be imposed depending on the student's background or preparation (e.g. courses for leveling in mathematics or coding that may not count toward the credits for the degree). All work must be completed within the 6-year period immediately preceding the degree conferral. Florida Poly Policy [FPU-5.0096A](#) delineates these and other requirements.

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

Program Learning Outcomes

Upon completion of the for the Master of Science in Engineering Management, students are expected to demonstrate the following outcomes:

1. Apply business fundamentals and develop strategies to address complex challenges in engineering, applied science, and related industries.
2. Identify, formulate, and solve engineering problems of single or multidisciplinary nature

- by applying principles of engineering, science, mathematics, and analytics.
3. Apply data science concepts, tools, and develop analytical insights to solve business and engineering problems.
 4. Communicate complex business and engineering problems to diverse audiences.

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 MS in Engineering Management curriculum is a 30 credit hour program comprised of the following courses:

- ACG 5176 - Financial & Managerial Accounting – *foundational*
- COP 5090 - Sci Comp & Programming – *foundational*
- MAN 5245 - Organizational Behavior & Leadership – *core*
- ESI 5315 - Optimization & Simulation – *core*
- ECP 5007 - Economic Analysis for Technologists – *core*
- CAP 5320 - Data Wrangling and Exploratory Data Analysis – *core analytics*
- CAP 5735 - Data Visualization and Reproducible Research – *core analytics*
- MAN 5596 - Global Supply Chain Management – *core*
- EGN 5626 - Engineering Project Management OR IDS 5950 - Project – *Elective options*
- MAN 6636 - Global Strategic Management & Leadership – *capstone course*

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

Course	Course Description:
COP 5090 - Scientific Computation and Programming	The course will introduce the students to scientific computing and graphics using R. The topics covered include programming with R, Numerical Accuracy, Root finding, Integration, Ordinary Differential Equations, Probability and Random Variables, Estimation, Markov Chains, and Basic Simulation.

Course	Course Description:
CAP 5320 - Data Wrangling and Exploratory Data Analysis	Preprocessing tasks often consume a large fraction of time in computational projects, and all downstream analyses depend on them. In this course, students will develop practical skills for working with large datasets. Topics will include common methods for gathering, organizing, and reshaping structured and unstructured data. We will also cover methods of exploratory data analysis that are useful to guide more focused questions and models. These include principles of information display, simple model forms and data reduction, common visualization methods, and reporting tools.
CAP 5735 - Data Visualization and Reproducible Research	A project-centered introduction to the visual display of quantitative information for both knowledge discovery and the communication of results. Fundamentals of reproducible research with attention to best practices and modern frameworks for data science project collaborations.
ACG 5176 - Financial & Managerial Accounting	Financial statement analysis including techniques, cash flow, and impact of accounting principles. Management control systems: planning, budgeting, reporting, analysis, and performance evaluation.
MAN 5245 - Organizational Behavior & Leadership	An investigation of ethical problems in business practice. Topics include personal morality in profit-oriented enterprise; codes of ethics; obligations to employees and other stakeholders; truth in advertising; whistleblowing and company loyalty; regulation, self and government; the logic and future of capitalism. Emphasis on business law and legal impacts on ethical decision making.
ESI 5315 - Optimization & Simulation	This course familiarizes the student with frequently used models in Operations Research. Such models include decision analysis; optimization techniques, and Discrete-Event Simulation. Course is supplemented with real world examples and cases.
ECP 5007 - Economic Analysis for Technologists	The course applies the tools of economic analysis to develop a systematic approach to critical thinking about problems in science and technology management, particularly under conditions of incomplete or imperfect information. Topics include time value of money; risk and uncertainty; demand approximation and forecasting; information acquisition, use, and value; real option value; optimal production and pricing under uncertainty; peak load pricing and optimal capacity; decisions in strategic environments, firm structure.
MAN 5596 - Global Supply Chain Mgmt.	This course will be a project and case study-based course that will focus on management and improvement of supply chain processes and performance. This course will cover the topics of global supply chain drivers, global supply chain distribution centers, inventory, packaging, transportation, trade agreements, sustainability, cost and innovation.
EGN 5626 - Engr Project Mgmt.	This course will provide students with an exposure to the tasks and challenges facing today's projects and in particular, those of the project manager to adhere to project scope, budget, time constraints while balancing project risks and rigorous quality demands.

Course	Course Description:
MAN 6636 - Global Strategic Management & Leadership	This course exposes the student to the many dimensions of strategic business planning and decision making in a fiercely competitive and rapidly changing global environment. The course covers the analysis of the external global environment; the creation of vision and mission statements that define the organization's strategic direction, role in society and long-term objectives; the development of effective business strategies for creating sustainable competitive advantage and for responding to the opportunities and threats identified in the external environment; and the successful implementation of the organization's strategies and achievement of its goals. The student will learn numerous strategic planning tools, concepts and techniques that are used to conduct the strategic management tasks. Students will understand how to think strategically and connect the disciplines of strategy and leadership to effectively assess, formulate, plan, and implement the strategic plan. The course is heavily based on published cases and may require doing a live case analysis with presentation to executives.

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 proposed program consists of coursework taught primarily in the Department of Data Science and Business Analytics. One course, COP 5090 Scientific Computation and Programming is typically taught by a DSBA professor, although it may also be taught by a CS Department faculty member. Given that both CS and DSBA have the same department chair, this is not expected to be a problem. All proposed courses are currently delivered through the DSBA department and COP 5090 is a course common to all of our master's degree programs. All Graduate curricula are coordinated by the Graduate Division, led by the Vice Provost of Academic Affairs and supported by the Graduate Management Team, which consists of department chairs for degree-granting programs/tracks. The Graduate Studies Committee serves as the curriculum and policy committee for all graduate programs and supports the Division in graduate quality management. Ultimately, the Provost holds all decision-making authority in terms of coordination and collaboration on course and program delivery.

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 proposed program will be offered only on the J.D. Alexander Main Campus of Florida Polytechnic University, 4700 Research Way, Lakeland, FL 33805.

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 proposed program is intended to be offered face-to-face. The university is authorized to offer up to 49% of a program via distributed learning methods. At this point, there are no plans to offer any coursework via distance learning. A greater likelihood is that some courses may be offered in a hybrid format where at least 50% of the course must be attended in person. No additional costs would be needed to delivery in alternative modalities. Consideration to do so is driven by efficiency and cost considerations and enrollment planning.

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.

Presently, the University has an [MOU with Florida Southern College](#) whereby seniors at Florida Poly may apply for early admission to Florida Southern College's MBA program. This initial agreement may lead to other collaborations in terms of faculty sharing and coursework, but a significant tuition differential renders this problematic.

Students enrolled in Florida Poly's program may take up to 12 credits from other SUS or private institutions and apply those credits toward the degree at Florida Poly, presuming alignment with program outcomes and content.

Faculty aligned with the proposed program are engaged in research collaborations with colleagues at USF.

Communication with FIU and FAMU has gone out regarding impact on enrollments, as well as communication on the program to nearby institutions with similar degrees (USF, UCF).

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.

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.

Not applicable. The program does not require any specialized accreditation.

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.

The University is currently undergoing a SACSCOC onsite visit (Feb 21-24, 2022). Offsite evaluation found no compliance issues with respect to our academic degree programs. Four undergraduate programs are accredited by ABET-EAC and ABET-CAC.

Program Review Recommendations

An internal program review was conducted during 2021, completed in the fall term, in compliance with University Policy and BOG regulation. The program review led to the following conclusions:

Broadly, recommendations for improvement fall along four areas: increase degrees granted by creating accelerated pathways; improve integrity of program structure through creating new degree program out of management track; improve course (and therefore) program quality; and, reach a sustainable funding model.

1. **Pathways:** The program has always been set up as a 2-year master's degree, culminating in a thesis for most students who may or may not complete in the two-year timeframe. This slows the production of degrees while making it costly from a faculty time-standpoint.

The pilot of 10-month, course only paths in Engineering Management and Mechanical Engineering, while initially very lately developed for the 2021-2022 academic year, may hold promise for increasing the recruiting class for 2022, especially if additional tracks opt to offer the same pathway. A steady pass-through of 10-month students coupled with the regular graduation timeframe of more traditional students would raise our overall degree productivity considerably, which benefits the University from a performance funding standpoint.

2. **Structure:** As the curriculum review section illustrates, the engineering management track differs the most from the other tracks, which concern more traditional engineering or technical fields. The EM track would likely grow better if it were a separate degree program

with ability to recruit and advertise in this way. Additionally, it would enable the University to address graduate level interest from the Department of Transportation by creating a transportation focus or track within an EM degree.

Another concern about EM within this program structure is that the coherence of the MS in Engineering may pose some level of risk from an accreditation standpoint. One can reasonably ask how the outcomes of the more traditional engineering fields are obtained by students in the management track, and vice versa.

3. **Quality:** recent efforts in hires and reorganizations within the Academic Departments has brought about the opportunity to focus on course consistency and quality and ensure that courses delivered at the graduate level require greater effort and higher expectations than those at the undergraduate. The recommendation here is that each track examine its course offerings, course outcomes with respect to program outcomes, requirements and course content to ensure relevant and appropriate inclusion of literature in the discipline and research as both a product but also a mindset that supports long-term career success.
4. **Support:** From a tuition and fees standpoint, the program is highly competitive; however, it is strongly subsidized by institutional funds and waivers. Fewer than 15% of graduate students receive some level of extramural funding, and assistantships are mostly across the board because it's a recruiting tool. Assistantships come with an out of state tuition and fee waiver, plus a stipend that is small given cost of living and recently increased to reduce the number of students engaged in outside work.

A 10-month pathway that is supplemented via waiver of certain fees but where students still pay a portion of tuition comes at a competitive per-credit hour rate would begin to generate income for the University. While the University will continue to provide assistantships to ensure continued program growth, how we fund and designate these assistantships can be adjusted. For instance, a highly-selective, research-assistantship available based only on the number of faculty who can support a graduate student would provide competition for better students at the Thesis-level.

By opening up more GAs as Teaching Assistants with a plan for them to assume some level of instructional responsibility in year two, we gain some off-set of teaching load for faculty and can consider a different support structure that may help drive demand and keep them focused on their graduate experience more exclusively.

Secondly, we should direct the GTAs into the Project track and only upon careful selection move students to the Thesis track of their research shows viability and promise. The Project option reduces faculty time commitment, which is a resource savings, and while faculty do not benefit as much from Project students as from Thesis students, given current and recent populations, the advantage in time would outweigh the otherwise exhausted and fruitless efforts of faculty who pour time into thesis students only to have them change to project in the penultimate or last semester.

Progress on Recommendations

1. **Pathways** – curriculum changes and critical decisions related to different time-pathways to degree completion have been supported by Graduate Management and Graduate Studies Committees and approved by the Provost. Recruiting for these pathways is underway. Engineering Management has been offered this way in the current academic year.
2. **Structure** – this proposal is a key result of this recommendation. The overall integrity of

the MS Engineering degree will be improved by moving the Engineering Management track to a new degree program. It also affords opportunities to offer tracks within EM that support industry and state interest as well as providing technical focus and coherence in the MS Engineering and opening up rational possibilities to extend our undergraduate offerings in Physics and Mathematics into the MS Engineering.

3. **Quality** – In developing the pathways, an review of course offerings was undertaken that included revisions and proposed new courses to support all graduate offerings and, specifically, course-only pathways. Departments have also disconnected most undergraduate/graduate courses, with some exception, and syllabus review requirements in each department are focusing in the quality of the graduate course offerings.
4. **Support** – The Board of Trustees approved a tuition waiver for graduate-level courses to reduce the overall cost of tuition to attend any of Florida Poly’s graduate programs. This enables us to deliver the course only (non-GA) options where tuition can be charged at a reasonable rate and over a shorter period of time, thus reducing the overall cost to the student, while bringing revenue to the institution that it currently does not accrue due to a heavily thesis-based program where students are nearly 100% supported as Graduate Assistants by institutional funds.

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.

The Department of Data Science and Business Analytics routinely collaborates with industry via our curriculum advisory boards and through regular adjunct faculty appointments with area industry employees. Insight from this group has provided the foundation for the business-side of the curricula, along with existing departmental expertise.

The proposed program includes employer-supported content through graduate level and foundational courses in business areas such as financial and managerial accounting and courses that focus on global business environment. The data science content has been deemed essential to effective management programs and is common, in some form, in other similar programs in the System and outside of Florida. Advanced engineering coursework in programming and simulation round out the necessary engineering elements and tie them to planning, strategy, management, and other critical business concepts.

Each of these content areas are represented in the program learning outcomes and topped with a focus on effective communication, a critical competency for success in this field.

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.

The program will be delivered primarily by four faculty in the department whose expertise covers the range of courses offered. An additional visiting position will be added for fall 2022 that goes toward supporting the broader needs in the Department of Data Science and Business Analytics but will contribute to at least one course in the graduate program on a regularly scheduled basis. The position may, at some point, become a MYA but remains visiting for the upcoming year.

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 table provides a snapshot of the program faculty’s efforts covering approximately 2 academic years (excluding summer). As a note, Departmental Service includes search committees, curriculum committees, student advising, and in some cases reappointment or promotion committee work (Associate or Full). Other service is noted more specifically. Research is not exhaustively listed here. Readers should look at the curriculum vitae for more detail.

Faculty	SCH Production (2-year)	Typical Service Role	Recent Research and Related Activities
Rei Sanchez-Arias, Asst. Professor, Asst. Department Chair	Sp'22 – 117 Fa'21 - 138 Sp'21 – 162 Fa'20 - 276	Assistant Department Chair; Graduate Studies Committee;	In last year- 3 publications; 4 invited talks; 4 conference presentations, one grant funded, one grant submitted. Graduate Thesis Advisor, Graduate

Faculty	SCH Production (2-year)	Typical Service Role	Recent Research and Related Activities
			Project Advisor, Department coordinator graduate advising (9 students)
Shahram Taj, Professor, Department Chair	Sp'22 – 42 Fa'21 – 30 Sp'21 – 45 Fa'20 - 30	Department Chair, DSBA and Computer Science. Significant Role on University Service, Collective Bargaining, Reappointment and Promotion, and other high-level faculty governance.	In last year – One invited talk; Graduate Student Advising; extensive curricular development and service to University.
Grisselle Centeno, Professor	Sp'22 – 114 Fa'21 – 105 Sp'21 – 36 Fa'20 - 69	Director Health Systems Engineering program, Departmental Service.	In last year-Three publications; 4 conference presentations; ongoing—NSF funded grant, \$600,000; two additional funded grants; one more proposed; multiple studies conducted for business/industry partners. 5 Graduate Theses/Projects Advised.
James Dewey, Asst. Professor	Sp'22 – 132 Fa'21 – 87 Sp'21 – 97 Fa'20 - 126	Academic Policy and Procedures Committee; Departmental Service.	In last year—Delivers Florida Price Level Index for Center for Applied Economic Analysis; Three presentations; four collaborative publications in progress; two funded projects. Two graduate Theses Advised,

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.

Table 3A shows the reallocated E&G as it relates to faculty salary and benefits. The amount shown depicts multiple faculty based on their percentage of time devoted to the program (teaching, primarily) with other roles part of their regular workload and administrative function already present within the department and the University through Graduate Division coordination and support. At least one additional hire to the program is anticipated after year one, along with a basic rate of increase over time to bring the figure up in year five. Again, apportioned across faculty time dedicated to the program.

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.

In 2018, the University received \$4.8 million in faculty salary funding, recurring. Subsequent new degree programs have been built out of this funding, including, most recently, our Bachelor of Science in Cybersecurity Engineering. Our analysis showed that the balance of this 4.8 million after year five, accounting for its expenditures in all newly implemented programs, would leave a remainder of \$2.6 million. Minus the \$1.28 million budgeted for Cybersecurity Engineering leaves us with the base amount noted in Table 4. From this base, the program will be easily funded.

The University practices a centralized method for appropriating faculty and academic affairs staff lines, meaning when an employee leaves, that line comes back to the Provost's office for redeployment where necessary and not always in the same unit. This results in a somewhat regular flow of salary savings over time, which, while not accounted for in this budget, supports the rest of the academic enterprise as reorganizations are needed to match demand and priorities.

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.

Current resident and non-resident tuition and fees per credit hour are shown in the following tables:

Residents

By AY	Per Credit Hour	Waiver	Tuition and Fees Paid
Prior to fall 2022	472.58	-	472.58
Eff. Fall 2022	472.58	150.00 (BOT Approved)	322.58

Non-Residents

By AY	Per Credit Hour	Waiver	Tuition and Fees Paid
Prior to fall 2022	1110.98	638.40	472.58
Eff. Fall 2022	1110.98	788.40 (BOT Approved)	322.58

The University is not positioning the program as continuing education nor as market-rate prices. At present, our graduate programs are heavily supported by the institution, where students typically receive scholarships for the remainder of tuition and a stipend for their assistantship. This course-only model with the shift in cost per credit hour enables us competitively with out of state markets (as well as in-state) and turns what would otherwise be institutionally funded students into tuition-paying students. The accelerated time minimizes the cost over time and the period during which a student may need assistance for cost-of-living (i.e., federal aid). Thus, while asking students to pay, the University is also reducing their total cost of attendance.

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.

At this time, we do not have external resources to support the program. The change in tuition and fees are designed to offset the amount of the program supported through E&G funds.

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 reviewed Sections VIII.A. and VIII.B.

The Florida Polytechnic University Library is comprised of two distinct collections: the main library collection and the Florida Industrial Phosphate Research (FIPR) Institute collection is primarily a print 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 a virtual library and to maintain an all-electronic collection. 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 electronic collection contains over 150,000 full text eBook volumes that are a mixture of owned and licensed materials.

The University Library provides support for all the degrees offered at the institution, including master's degrees in engineering and computer science and four ABET accredited bachelor's degrees. In addition to our eBook collection, the library also provides access to journal articles and other scholarly publications. These resources are discoverable by searching the library catalog or by accessing subscribed databases through the library's main LibGuide. Resources that directly support Florida Poly's current engineering programs will also directly support the proposed Engineering Management program. Current library resources include the ACM Digital Library, ASME Digital Library, Elsevier's Science Direct and Engineering Village, IEEE Xplore Electronic Library, and ProQuest's SciTech Premium and ABI/Inform Collections, and ProQuest eBook Central.

Major journals currently available through the Florida Poly Library that will directly support Engineering Management include:

- Business Process Management (1995 – Present)
- Engineering, Construction, and Architecture (2003 – Present)
- Engineering Management Journal (1997 – Present)
- IEEE Engineering Management Review (1973 – Present)
- IEEE Transactions on Engineering Management (1963 – Present)
- Management and Engineering (2010 – 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.

Program will use existing facilities and equipment currently available. Space will be allocated to full-time graduate students in the upcoming Applied Research Center (ARC) building.

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.

The proposed program is a tuition-only program. Its accelerated nature makes it affordable to earn without creating financial obligations on the part of the university. The University's Board of Trustees approved an additional graduate tuition waiver to bring the overall cost of the program more in line with other System institutions, but outside of this waiver – automatically applied to a student's tuition bill – the remaining revenue comes from tuition.

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			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		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		X	X	X
E	Faculty Curriculum Vitae			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.		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		X		

H	Request for Limited Access Status	Required only for baccalaureate degree programs seeking approval for limited access status		X		
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Table 2. Additional Appendices

Appendix	Appendix Title	Description
A	BOG Tables 1 – 4	Enrollment and Finance
B	Internal Letters	Not applicable
C	Faculty	Curriculum Vitae

Appendix A. BOG Enrollment and Finance Tables

APPENDIX A
TABLE 1-B
PROJECTED HEADCOUNT FROM POTENTIAL SOURCES
(Graduate Degree Program - MS Engineering Management)

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
Individuals drawn from agencies/industries in your service area (e.g., older returning students)	1	0.5	2	1	3	1.8	4	2.4	4	2.6
Students who transfer from other graduate programs within the university**	1	0.6	2	1.5	2	1.2	3	1.8	3	1.95
Individuals who have recently graduated from preceding degree programs at this university	9	4.5	15	7.5	22	13.2	26	16.9	31	21.7
Individuals who graduated from preceding degree programs at other Florida public universities	1	0.7	1	0.7	1	0.7	1	0.7	1	0.7
Individuals who graduated from preceding degree programs at non-public Florida institutions	0	0	0	0	0	0	1	0.7	1	0.7
Additional in-state residents***	0	0	0	0	0	0	0	0	0	0
Additional out-of-state residents***	0	0	0	0	0	0	0	0	0	0
Additional foreign residents***	0	0	0	0	0	0	0	0	0	0
Other (Explain)***	0	0	0	0	0	0	0	0	0	0
Totals	12	6.3	20	10.7	28	16.9	35	22.5	40	27.65

* 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 (MS ENG. MGMT)
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	Rei Sanchez-Arias, Ph.D. Computational Science	Asst. Prof.	MYA	Fall 2022	9	0.75	0.25	0.19	9	0.75	0.25	0.19
A	Shahram Taj, Ph.D Industrial Eng. & Operations	Prof.	MYA	Fall 2022	9	0.75	0.50	0.38	9	0.75	0.50	0.38
A	Grisselle Centeno, Ph.D. Industrial Engineering	Prof.	MYA	Fall 2022	9	0.75	0.25	0.19	9	0.75	0.25	0.19
A	James Dewey, Ph.D. Economics	Asst. Prof.	MYA	Fall 2022	9	0.75	0.25	0.19	9	0.75	0.50	0.38
A	Visiting Faculty Computational Science	Asst. Prof.	MYA	Fall 2022	9	0.75	0.25	0.19	9	0.75	0.25	0.19
	New Hire, Degree Academic Discipline				0	0.00	0.00	0.00	0	0.00	0.00	0.00
	New Hire, Degree Academic Discipline				0	0.00	0.00	0.00	0	0.00	0.00	0.00
	New Hire, Degree Academic Discipline				0	0.00	0.00	0.00	0	0.00	0.00	0.00
	Total Person-Years (PY)							1.13				1.31

Faculty Code	Code Description	Source of Funding	PY Workload by Budget Classification	
			Year 1	Year 5
A	Existing faculty on a regular line	Current Education & General Revenue	1.13	1.31
B	New faculty to be hired on a vacant line	Current Education & General Revenue	0.00	0.00
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 regular/tenure-track line course load	Enterprise Auxiliary Funds	0.00	0.00
Overall Totals for			1.13	1.31

Worksheet Table 2 Faculty Participation

APPENDIX A
TABLE 3A - MS ENG. MGMT
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)	138,353	0	0	0	0	0	0	\$138,353	170,812	0	0	0	0	0	\$170,812
Salaries and Benefits (A&P and USPS)	0	0	0	0	0	0	0	\$0	0	0	0	0	0	0	\$0
OPS (including assistantships & fellowships)	0	0	0	0	0	0	0	\$0	0	0	0	0	0	0	\$0
Programmatic Expenses****	0	0	0	0	0	0	0	\$0	0	0	0	0	0	0	\$0
Total Costs	\$138,353	\$0	\$0	\$0	\$0	\$0	\$0	\$138,353	\$170,812	\$0	\$0	\$0	\$0	\$0	\$170,812

*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)	1.13	1.31
FTE (A&P and USPS)	0	0

Calculated Cost per Student FTE

	Year 1	Year 5
Total E&G Funding	\$138,353	\$170,812
Annual Student FTE	6.3	27.65
E&G Cost per FTE	21960.7937	6177.64919

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 tuition and fees trust 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.

Note: TABLE 3B CONTINUING EDUCATION, SELF-SUPPORTING AND MARKET RATE PROGRAM BUDGET – NOT APPLICABLE

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
Account: Academic Affairs Salary Savings and . . .	1,318,310	138,353	\$1,179,957
other unfilled existing budgeted faculty lines.	0	0	\$0
	0	0	\$0
	0	0	\$0
	0	0	\$0
	0	0	\$0
	0	0	\$0
	0	0	\$0
Totals	\$1,318,310	\$138,353	\$1,179,957
* If not reallocating E&G funds, please submit a zeroed Table 4			

Appendix B. Internal Letters

As noted in the proposal, Florida Poly's graduate programs are all collaborative delivered and managed by the Graduate Division Director in collaboration with the Provost and the Academic Department Chairs (GMT-Graduate Management Team) for departments that have tracks or programs within the degree. Presently, all programs are delivered with some degree of common courses and the addition of this program would not alter that arrangement. In fact, it has facilitated some greater collaboration and efficiencies in course delivery.

The Graduate Management Team is further supported by the Graduate Studies Committee, which reviews and recommends policy, curriculum, program assessment, other program documents, and conducts student progress reviews.

Appendix C. Faculty Curriculum Vitae

CURRICULUM VITAE
GRISSELLE CENTENO, PH.D.

PROFESSOR AND DIRECTOR -HEALTH SYSTEMS ENGINEERING

4700 Research Way,
Lakeland, FL 33805-8531

Tel. (863) 874-8456
Fax. (863) 874-8711
Email: gcenteno@floridapoly.edu

EDUCATION

- University of Central Florida, Orlando, FL
Ph.D. in Industrial Engineering 3.9/4.0 August, 1998
Dissertation: "Parallel Machine Scheduling with Specified Release Dates, Due Dates, and Machine Eligibility Restrictions"
Integrates concepts in optimization, production and inventory control, information systems and applications in Semiconductor Manufacturing
Major Area: Operations Research
- M.S. in Industrial Engineering May 1994
Thesis: "A Methodology for the Selection of Critical Processes and Alternatives in a Benchmarking Project"
Integrates concepts in multicriteria decision making, analytic hierarchy process and benchmarking.
Major Areas: Operations Research and Quality Control
- University of Puerto Rico, Mayagüez, PR
B.S. in Industrial Engineering, Magna Cum Laude May 1992

PROFESSIONAL EXPERIENCE

Academic Positions

- Florida Polytechnic University Jan 2019 - present
Professor, Data Science and Business Analytics
Director, Health Systems Engineering
- University of South Florida August 2000 – Dec 2019
Associate Faculty, Morsani College of Medicine - (Joint appointment since Summer 2015)
Health Systems Engineering Scholarly Concentration Director, (Since 2017)
Associate Professor, Industrial and Management Systems Engineering (Since 2007)
Associate Faculty member of the Center for Urban Transportation Research Since 2003
Previous Positions: Assistant Professor (2001 - 2007); Visiting Assistant Professor (2000 - 2001)
Responsibilities:
- Conduct research on Applied Operations Research and related areas
 - Teach graduate level courses in Operations Research, Multivariate Optimization, Engineering Statistics and Graduate Research Seminar on Special Optimization Topics including Transportation applications, Operations and Healthcare, Advanced Production Control and Engineering the Supply Chain
 - Teach undergraduate level courses in Operations Research, Engineering Economics, Facilities Design, Engineering Statistics, Work Analysis and designated laboratory, Production Control
 - Serve as the IE Coordinator for the Research Experience for Undergraduates Program
- University of Central Florida, Orlando, FL August 1997 – July 2000
Positions: Adjunct Instructor (1997-1999); Post-Doctoral Researcher (1999-2000)
Responsibilities:
- Teach graduate level course in Operations Research, and Advanced Engineering Economic Analysis; and undergraduate courses in Probability and Statistics for Engineers, Work Measurement, Engineering Economics, and Operations Research.

- Serve as a Post-Doctoral Systems Analyst for UCF21: "University's Customer Focus for the 21st Century," Operational Excellence Initiative, Phase 2.
Project 1: Conducted a workload analysis, risk analysis and task analysis for the Registrar's Office. Developed a staffing model for the University's Registrar.
Project 2: Develop a system for the Office of Graduate Studies that helps the Associate Vice President of Graduate Studies to accurately estimate and forecast future enrollments reported to the Board of Regents (BOR).

Industrial Experience and Consulting

Walt Disney World Resort, Orlando, FL

June 2006- November 2020

Position: Senior Operations Research Consultant

Provide support to the Industrial Engineering and Experience Insight team on projects related to optimization and process improvement across the various lines of business within the Corporation.

Major Projects:

- Developed mathematical models to schedule entertainment casts to shows and parades considering skill levels and union specifications.
- Develop metrics to quantify impact of mathematical models compared to actual approaches to schedule bus drivers to shifts.
- Support the development of wait time models and decision tools for WDW Preferred Attractions.
- Support the development of the lodging assignments for the task force and business trips for training of new cast for the new resorts and cruise line.

Lucent Technologies, Orlando, FL

August 1992 – July 1998

Position: Graduate Student Researcher Fellow

Research position while pursuing M.S. and Ph.D. in Industrial Engineering.

Major Accomplishments:

- Developed a heuristic, which reduced average lot completion time by 50% and the number of lots in queue by 70% in the product test area. – based work for PhD dissertation.
- Implemented a decision support tool at wafer probe to assign jobs to resources over time. The goal of the project was to optimize workflow based on current team priorities, which includes optimizing for cycle time, capacity, or customer service. The system generates reports on demand and specifies where and when jobs must be tested. It also automatically generates a summary of projected cycle time and queue time.
- Designed production area and facilities considering workflow, material handling, workstations, and availability for future expansions.

Abbott Laboratories, Barceloneta, PR

Summer 1992

Position: Industrial Engineer

Major Accomplishments:

- Designed macro and micro layout of the Diagnostic Division Area applying human factors and ergonomics
- Conducted cost benefit analyses of designed alternatives

Baxter Healthcare, Bentley Division, Añasco, PR

August 1991 - May 1992

Position: Assistant Engineer

Major Accomplishments:

- Implemented a Kanban system -- introduced just-in-time philosophy
- Designed a material handling system from warehouse to production area

SmithKline Beecham Pharmaceuticals -- Cidra, PR

Summer 1991

Position: Summer Student

Major Accomplishments:

- Designed and documented a system for equipment changeovers in the Packing Department
- Conducted an analysis of the product flow and made recommendations for improvement

HONORS AND AWARDS

- Featured for "What's your story" [ISE Magazine](#), Nov 2021
- ABLAZE [excellence in research award recipient](#), Florida Polytechnic University, 2020
- [ELATES fellow](#), 2019-2020
- Advanced Manufacturing Workshop: Preparing the Next Generation of Researchers, Invited participant– Iowa State University, NSF sponsored, October 2017
- 2016 Symposium: 21st Century Mindsets & Strategies for Career Advancement, University of California, Berkeley
- Frontiers of Engineering Education Symposium fellow, 2015 – National Academy of Engineering
- 2013 recipient of the Faculty Research Award from Women Leadership and Philanthropy- WLP
- Women's International Research Engineering Summit, Invited participant, NSF-Advance sponsored, Barcelona, Spain, 2009
- IIE Outstanding Young IE in Education Award, (runner up) 2006
- Who is Who in Engineering Education, 2006
- Outstanding Teaching Award 2004/2005 – USF and Engineering
- PASI Award – Transportation Science Participant, 2005
- Who's Who in America, 2004

PROFESSIONAL AFFILIATIONS

- Institute of Industrial and Systems Engineers (IISE) member since 1989
- Alpha Pi Mu, Industrial Engineering Honor Society inducted 1990
- Tau Beta Pi, Engineering Honor Society inducted 1991
- Institute for Operations Research and the Management Sciences member since 1995
- Decision Sciences Institute (DSI) member since 1996
- Society of Hispanic and Professional Engineers (SHPE) member since 2001

PATENTS, GRANTS AND RESEARCH FUNDING

Patent:

Title: Supervised Learning Methods for the Prediction of Tumor Radiosensitivity to Preoperative Radiochemotherapy. Serial Number 62/049,431 Filed: September 12, 2019

Current Grants:

G. Centeno (PI), K. Reeves, M. Hughes Miller, E. Englehardt, Standard Collaborative: "Enhancing Internships with Professional Ethics Training: Cultivating an Ethical Engineer Identity", National Science Foundation Jan 2020-Dec 2023, \$600,000

Grants Under review:

Susan LeFrancois (PI), Centeno G. Co-PI: "Utilizing Data and Technology to Advance Maternal Health Equity", Florida Blue, Jan 2022-Dec 2025, \$676,183

Other Funded and completed grants/projects:

R. Sanchez-Arias(PI) and G. Centeno (Co-PI), Enhancing simulation and testing of emergency medical service vehicles in AVs settings, Advanced Mobility Institute 2020-2021 Seed Award Program, Completed 04/20-04/21, \$20,687

T. Allen (PI), Broadening Participation of STEM Faculty through Work Design, National Science Foundation, 2015-2020, \$380,000

Centeno Grisselle (PI), "Increasing Diversity in Engineering Education through Healthcare Applications", National Science Foundation, 2013-2015, \$199,999.

Centeno Grisselle (PI), "Case Studies Development as Constructivist Pedagogy for Teaching Work Analysis and Design", National Science Foundation, \$150,000

T. Das (PI), Okogbaa G., G. Centeno, "USF: Students, Teachers and Resources in the Sciences (STARS II), An NSF GK-12" National Science Foundation, \$1,800,000

Centeno Grisselle (PI), "Capacity Assessment and Planning Tool: A Decision Support Model", funded by Raymond James & Associates Inc., \$5,000

Centeno Grisselle (PI) and Rajesh Chaudhary, "Repair Time Standards for Transit Vehicles- Phase 4", Funded by Florida Department of Transportation, \$120,000

Rajesh Chaudhary (PI) and Grisselle Centeno (Co-PI) "Maintenance Management Software for Public Transit Industry in Florida", Funded by NCTR, \$75,000

Centeno Grisselle (PI) and Rajesh Chaudhary, "Repair Time Standards for Transit Vehicles- Phase 3", Funded by Florida Department of Transportation, \$107,000

Steve Sadow (PI), Andrew Hoff, John Wolan and Grisselle Centeno (Co-PI) "Novel Silicon Carbide Technology Development", Funded by ONR, \$740,000

Centeno, Grisselle (PI), "Queuing Analysis of Emergency Departments Flow and Impact on Nursing Resource Allocation" Funded by USF College of Engineering and College of Nursing, \$15,000

Centeno Grisselle (PI), Greg Weisenborn, Mary Matz, "Productivity Outcome Metrics in Patient Handling & Movement" Funded by Patient Safety Center, \$12,000

Centeno Grisselle (PI), Rajesh Chaudhary, "Repair Time Standards for Transit Vehicles" Phase 3, Project funded by Florida Department of Transportation, \$107,000

Yalcin Ali (PI), Centeno Grisselle (Co-PI), and Jose Zayas- Castro, "Simulation, Analysis and Re-Design of Security Checkpoints at Major Commercial Airports" Funded by UCITSS, \$205,000

Okogbaa G. (PI), Grisselle Centeno (Co-PI), T. Das, A. Kumar, B. Townsend "University of South Florida: Students, Teachers, And Resources in the Sciences (STARS)" an NSF GK-12 Fellows Project. Award No. DGE-0139348, \$1,530,000

Hagen Larry (PI), Centeno Grisselle (Co-PI) "A Toolbox for Reducing Queues at Freeway Off-Ramps" funded by Florida Department of Transportation, \$120,000

Centeno Grisselle (PI) "Innovative Capacity and Pricing Models for Parking Services" funded by USF, New Researchers Grant, \$6,238

Moreno Wilfrido and Grisselle Centeno (Co-PI), "Development of a Non-destructive Methodology and Apparatus using Ultrasonic Diagnostics for CMP Pad" unsolicited proposal to Lucent Technologies, \$296,322

Centeno Grisselle (PI) and Ed Bart, "Repair Time Standards for Transit Vehicles, Phase 2" Project funded by Florida Department of Transportation contract, \$39,630

Centeno Grisselle (PI) and Lisa Staes, "Repair Time Standards for Transit Vehicles" Project funded by Florida Department of Transportation contract # BC137 RPWO#32, \$50,000

Other recent (past 5 years) unfunded proposals:

Vollaro Mary (PI), G. Centeno (Co-PI) and J. Lee, Project Title: Increasing Opportunities for Rural Students through creative Recruitment and Retention, National Science Foundation, 2019, \$649,789 – *declined*

Torres- Roca Javier (PI), Centeno G. Co-PI (25%) A Genomic Framework for Personalized Radiation Therapy in Breast Cancer, National Institute of Health, \$2,000,000 – *declined*

Reeves Kingsley (PI), Centeno G. Co-PI (33%) Standard: Understanding Environmental Factors that Influence STEM Students' Motivation to Act Ethically in the Classroom and in the Workplace \$600,000 – *declined*

- Centeno Grisselle (PI), Reeves Kingsley, Hughes Michelle, "Understanding How the Higher Educational Environment Promotes STEM Student Motivation to Learn", Core R&D Programs, National Science Foundation, 2017, \$499,775 – *declined*
- Alcantar Norma (PI), Centeno (Co-PI), "PFI:BIC - Systems to remove off-flavor contaminants in aquaculture for increasing product quality.", 2017, PARTNERSHIPS FOR INNOVATION-PFI program National Science Foundation, \$1,000,000 – *declined*
- Reeves Kingsley (PI), Centeno Grisselle (Co-PI), "Understanding Academic Settings that Promote Ethical Behavior within the Classroom and Beyond", National Science Foundation, Cultivating Cultures of Ethical STEM program, 2017, \$594,851 – *declined*
- Moreno Wilfrido (PI), Centeno Grisselle (Co-PI), Interdisciplinary Project Based Intervention to Impact Retention and Diversity, The Leona M. and Harry B. Helmsley Charitable Trust, 2016, \$50,000 – *declined*
- A Proposed FLC-USF Engineering Approach to Support the Goal of: "Transforming STEM Education Across Florida's Consortium of Metropolitan Research Universities" – in collaboration with CoE for ATLE and the Helmsley Trust

PUBLICATIONS AND RESEARCH

Books

- K. Reeves and G. Centeno, "Probability and Statistics for Engineers" – Open Source Book, University of South Florida – Sponsored by USF Provost Office, (in-progress, Fall 2022)

Referred Publications (*Published or under review*)

- Kingsley A. Reeves, Jr., Victor Hernandez-Gantes, Grisselle Centeno, Carolina Gushi Nurnberg (2021) Game—Constructivist Exercises to Enhance Teaching of Probability and Statistics for Engineers. *INFORMS Transactions on Education* 22(1):55-64.
- French, Kimberly A., Tammy D. Allen, Michelle Hughes Miller, Eun Sook Kim, and Grisselle Centeno. "Faculty time allocation in relation to work-family balance, job satisfaction, commitment, and turnover intentions." *Journal of Vocational Behavior* 120 (2020): 103443.
- Serkan Gunpinar, and G. Centeno. "An integer programming approach to the bloodmobile routing problem" *Transportation Research Part E: Logistics and Transportation Review*, V.86, pp. 94-115, 2016
- Serkan Gunpinar, and G. Centeno. Stochastic integer programming models for reducing wastages and shortages of blood products at hospitals. *Computers & Operations Research*, V. 54, pp 129-141, 2015
- FA Rico, G Centeno, L Kuznia, EA Steven, JF Torres-Roca, "Supervised Learning Methods for the Prediction of Tumor Radiosensitivity to Preoperative Radiochemotherapy", *International Journal of Radiation Oncology Biology Physics* Volume 90, Issue 1, Pages S823, 2014
- L. Kuznia, B. Zeng, G. Centeno, Z. Miao, "Stochastic Optimization for Power System Configuration with Renewable Energy in Remote Areas", *Annals of Operations Research* – Vol. 210, Is. 1, pp 411-432, 2013
- Luis Daniel Otero, Grisselle Centeno, and Alex Ruiz-Torres, "A Fuzzy Goal Programming Model for Skill-Based Personnel Assignments", *Journal of Multicriteria Decision Making*, Vol. 2, Issue 4, pp. 313-337, 2012
- Otero, L.D., Centeno, G, Otero, C.E., Reeves, K., "DEA-Tobit Approach to Identify Key Assignment Criteria in Software Engineering," *IEEE Transactions on Engineering Management*, Vol. 59, No. 3, pp. 391 – 400, 2012

- Otero, L.D., Otero, C.E. and Centeno G., "A Fuzzy Expert System Architecture for Capability Assessments in Software Engineering Environments," *Expert Systems with Applications*, Vol. 39, No. 1, pp. 654 – 662, 2012
- L. D. Otero, G. Centeno, A. J. Ruiz-Torres and C. E. Otero, "A Systematic Approach for Resource Allocation in Software Projects", *Computers & Industrial Engineering*, Vol. 56, Issue 4, pp. 1333 – 1339, 2009
- Alex J. Ruiz-Torres, Grisselle Centeno, 2008. "Minimizing the Number of Late Jobs for the Permutation Flowshop Problem with Secondary Resources", *Computers and Operations Research* Volume 35, Issue 4, Pages 1227-1249
- Florentino Rico, Ehsan Salari and Grisselle Centeno, "Emergency departments nurse allocation to face a pandemic influenza outbreak" *Proceedings of Winter Simulation Conference*, pp 1292-1298, 2008
- Alex J. Ruiz-Torres and Grisselle Centeno: Scheduling with flexible resources in parallel workcenters to minimize maximum completion time. *Computers & OR* 34 (1): 48-69, 2007
- Grisselle Centeno, Rajesh Chaudhary, Paula A. Lopez, A Systematic Approach for Developing Standard Times for Repair Activities in Transit Vehicles, *Transportation Research Records*, No. 1927, pp. 112-122, 2006
- Centeno, G., Sampath, V., Moreno, W., Tadi, B., Maignel, J. (2005). Nondestructive Characterization of CMP Pads Using Statistical Design Analysis. *IEEE Transactions on Semiconductor Manufacturing*, 18:4,664-671.
- Centeno, Grisselle and Robert L. Armacost, "Parallel Machine Scheduling with Release Dates, Due Dates, and Machine Eligibility Restrictions for Minimizing Makespan," *International Journal of Production Research*, Vol. 42 No. 6, pp.1243-1256, 2004
- Centeno, Grisselle and Robert Armacost, "Parallel Machine Scheduling with Release Time and Machine Eligibility Restrictions," *Computers and Industrial Engineering*, Vol. 33, 1997.
- Centeno, Grisselle and M. Mollaghasemi, "A Methodology for a Multiple Criteria Selection of Critical Processes and Alternatives in a Benchmarking Project," *International Journal of Industrial Engineering: Applications and Practices*, Vol. 2, No. 3, 1995.

Proceedings Publications and Conference Presentations

- S. N. Mithy, G. Centeno and I. Khalilullah, "Development of Multistage RFE-SVR Model to Predict Radiation Sensitivity," 2020 International Conference on Computational Science and Computational Intelligence (CSCI), 2020, pp. 1541-1546, doi: 10.1109/CSCI51800.2020.00286
- K. Kauffman, G. Centeno, Reducing Hospital Acquired Clostridium Difficile Infections at Community Hospital System – Healthcare Systems Process Improvement Conference, San Antonio, TX (2019) <https://www.xcdsystem.com/hspi/program/DPa38hv/index.cfm?pgid=1406#C>
- Sharmin Nahar Mithy, Grisselle Centeno, Susana Lai-Yuen, "RFE-SVR Prediction Modeling for Microarray Gene Expression Analysis" INFORMS National Conference Seattle, 2019
- Kingsley A. Reeves Grisselle Centeno, "Research Opportunities to Improve Education through Engineering" INFORMS National Conference Seattle, 2019
- G. Centeno, J. Iezzi, Academic and Industry Collaborative Lean Six Sigma Custom Course – Healthcare Systems Process Improvement Conference, San Antonio, TX (2019)
- G. Centeno, M. Sinclair, K. Reeves, J. Lebsack, T. Kubal, Patient Panel Analysis and Optimization for Oncology Patients – Healthcare Systems Process Improvement Conference, San Antonio, TX (2019)
- G. Centeno and K. Reeves, "Driving Change in the Education Industry through Engineering", Industry Studies Association Conference, Seattle WA, 2018 – refereed paper and presentation
- Kingsley Reeves, and Grisselle Centeno, "Education Services Sector Studies: A Fruitful Field for Industrial Engineering Research", IISE National Conference, Orlando FL 2018 – presentation

- Grisselle Centeno, Kingsley Reeves and Carolina Gushi, "Constructivism in Engineering Education and Students' Motivation to Learn", IISE National Conference, Orlando FL 2018 – presentation
- Grisselle Centeno, Susana Lai-Yuen, Iman Nekooimehr, Sharmin Mithy, Clarissa Arriaga, Carolina Giron, The Impact of Healthcare-Related Workshops on Student Motivation and Retention in Engineering, ASEE PEER, published, paper ID #19341, 2017 – Refereed paper and poster presentation
- Grisselle Centeno and Florentino Rico, "Predicting Radiation Therapy Response Using Gene Expression Profiles" – Healthcare Systems Process Improvement Conference, Orlando FL, 2017 – presentation
- Grisselle Centeno and Susana Lai-Yuen, "Increasing Diversity in Engineering through Healthcare Applications" – Healthcare Systems Process Improvement Conference, Orlando FL, 2017 – presentation
- K. French, V. Mancini, M. Hughes Miller, G. Centeno, E Kim, "Faculty Time Allocation: A Latent Profile Approach" 2017 – Society for Industrial and Organizational Psychology, SIOP Conference, Orlando, Florida – presentation
- Sharmin Mithy, Grisselle Centeno, "Microarray Data Analysis in the Prognosis of Cancer" – 2017 INFORMS Annual Conference, Houston, TX – presentation
- Kingsley A. Reeves, Grisselle Centeno, Garrett Bowleg, Brittany Clift, "Reimagining the Engineering Textbook: Learning-centered Textbook Design" – 2017 INFORMS Annual Conference, Houston, TX – presentation
- Grisselle Centeno, Susana Lai-Yuen, Iman Nekooimehr, Audra Banaszak, Ashley Ishak, "Impact of Healthcare-related Pedagogical Interventions on Student Motivation and Retention", IISE, 2016 (refereed)
- Florentino Rico, Grisselle Centeno, Sharmin Mithy, "Fuzzy Approach for Selection of Treatment Strategy in Cancer Treatment", IISE, 2016 (refereed)
- Grisselle Centeno, Susana Lai-Yuen, Iman Nekooimehr, "Increasing Diversity in Engineering through Healthcare Applications", AAAS Conference, Washington DC, 2016 (refereed)
- Centeno G., Gunpinar S., "Integer Programming Model to Solve Bloodmobiles Routing Problem", INFORMS 2015, Philadelphia
- Lai Yuen, S. and Centeno G., "Innovative Pedagogical Interventions to Increase Retention of Women in Engineering", INFORMS Annual Conference, 2015, Philadelphia
- Centeno Grisselle, "Increasing Diversity in Engineering Education and Labor force through Healthcare Applications", Frontiers of Engineering Education, National Academy of Engineering, 2015
- F. Rico, G. Centeno, L. Kuznia, S. Eschrich and J. Torres-Roca, "Supervised Learning Methods for the Prediction of Tumor Radiosensitivity to Preoperative Radio chemotherapy" ASTRO Conference, 2014
- Rico, F., & Grisselle Centeno. Prediction of Cancer Patient Radiosensitivity using Genomic Expressions. ISERC 2013
- L. Kuznia, G. Centeno "A Primal Algorithm for Solving Chance Constrained Mixed Integer Programming Problems," at INFORMS Annual Meeting, Charlotte, NC, November 2011 - invited
- L. Kuznia, G. Centeno "Long Term Planning for Palliative Chemotherapy for Late Stage Cancer Patients," at INFORMS Annual Meeting, Charlotte, NC, November 2011 – invited
- L. Kuznia, G. Centeno "Multi-period Hybrid Power System Design for Remote Areas," at INFORMS Annual Meeting, Charlotte, NC, November 2011 – invited
- L. Kuznia, G. Centeno "Stochastic Optimization of Power Supply Systems in Isolated Regions with Renewable Energy," at INFORMS Annual Meeting, Austin, TX, November 2010 - invited
- Rico, F., Centeno, G. Simulation-Based Optimization for Medical Staff Allocation During a Pandemic. IERC 2011. Reno, Nevada.

- Rico, F., Centeno, G. Emergency Department Capacity Planning for Various Influenza Patient Demand Levels. IERC 2011. Reno, Nevada
- G. Centeno, L. Kuznia, and F. Rico, "Constructivist Case-Based Learning in Work Analysis and Design Course," Proceedings of the 2011 Industrial Engineering Research Conference
- M. Davila and G. Centeno, "Impact of turnover-times and surgeon's estimates in Operating Room utilization", IERC 2011. Reno, Nevada
- Luis D. Otero, Carlos E. Otero, Grisselle Centeno, "A Multi-Objective Model for Resource Assignments in Software Engineering," 2010 International Conference on Artificial Intelligence (*ICAI*), 2010. -- (2010 World-wide top-ranked conference by Microsoft Academic Search) - peer reviewed
- Florentino Rico, Ehsan Salari and Grisselle Centeno, "Emergency departments nurse allocation to face a pandemic influenza outbreak" *Proceedings of Winter Simulation Conference*, 2008 pp 1292-1298
- Grisselle Centeno, Nicholas A. Coblio, Paul R. McCright, and Heidi M. Means. "Reducing Human Error in a Pharmacy Through Bar Code System Improvements." *Proceedings of Human Factors in Organizational Design and Management (ODAM) Symposium*, 2005.
- Paul R. McCright, Nicholas A. Coblio and Grisselle Centeno. "Impact of Pharmacy Work Environment on Medication Dispensing Errors." *Proceedings of Human Factors in Organizational Design and Management (ODAM) Symposium*, 2005.
- G. Centeno and D. Rojas, "Revenue Management Applied to the Parking Industry," 2004 *Referee Proceedings IIE Annual Conference*.
- Paula Lopez and G. Centeno, "Integrated Scheduling and Information Support System for Transit Maintenance Departments," *Referee Proceedings IIE Annual Conference*, May 2005.
- Jose L. Zayas-Castro, Michael Weng, Grisselle Centeno, Jana Iezzi, Kiara Perez-Blanco, "Engineering Service at H. Lee Moffitt Cancer Center hospital: The Case for improving patient scheduling 2004 *Referee Proceedings IIE Annual Conference*, May 2005.
- Grisselle Centeno, LaNetra Clayton, Luis D. Otero and Souheil Zekri, "Innovative Modules to Introduce Advance Science and Engineering Concepts," *IEEE Proceedings Frontiers in Education 34th Annual Conference*, Savannah Georgia, October 2004
- Miguel Labrador, John T. Wolan, Grisselle Centeno, Ashok Kumar, Gray Mullins, and Rudiger Schlaf, "A Research Initiative to Close the Gap between Undergraduate and Graduate School in Engineering," *IEEE Proceedings Frontiers in Education 34th Annual Conference*, Savannah Georgia, October 2004
- Mayur Sedani, Michael Weng and Grisselle Centeno "Single machine scheduling with distinct due date, processing time, and earliness and tardiness penalties" Flexible Automation and Intelligent Manufacturing (FAIM) Conference Proceeding 2003
- Alejandro Carbo, Carlos Paternina and Grisselle Centeno "Modeling the Logistic System of a Fertilizer Company" International Journal of Computers and Industrial Engineering, 2003
- Grisselle Centeno, V. Sampath, A. Eranki, W. Moreno, P. Datar, B.Tadi, "Application of Statistical Design Models for the Characterization of CMP Pads Using Non-Destructive Ultrasonic Methodology and Laser Testing Methodology" Annual IIE Conference Proceedings, May 2002

Other Talks

- "Careers Paths in OR", INFORMS Doctoral Colloquium, Oct 2021 – with Iara Luis-Stoll and Scott Mason
- "Teaching Strategies", IISE New Faculty Colloquium, May 2021 – with Denis Cormier and Katie Basinger-Ellis
- "Enhancing Simulation and Testing of Emergency Medical Service Vehicles in AVs Settings: Project Status Report". Presentation at AMI seminar. Florida Polytechnic University, Lakeland, FL. May 2020 (with Reinaldo Sanchez-Arias)

"Establishing an HSE Center at Florida Polytechnic University", ELATES Institutional Action Project, 2021 – presented to Deans, Provosts and Presidents from over 30 higher-Ed Institutions from across the Nation.

"About Women in STEM and Research", Women in STEM panel discussion, sponsored by Florida Poly Advancement Office – Webex Presentation – Over 90 attendees from local community

"Enhancing Simulation and Testing of Emergency Medical Service Vehicles in AVs Settings: Project Status Report". Presentation at AMI seminar Florida Polytechnic University, Lakeland, FL. June 2020.

Created and delivered Workshop: "How to Create an Effective Curriculum to Train Acculturated Staff within your Health Organization" Invited pre-conference HSPI, IISE (4 hours)

Opening Keynote: "On Developing Supply Chain Talent: Challenges and Opportunities", Central Florida Roundtable, Talent Development Symposium, March 7PthP, 2019

Presented and opened event for West Central FL Acute Stroke Council, May 8, 2019

Invited Speaker Florida Poly Board of Trustees (BOT) retreat, May 22, 2019

Bay News 9 interview – "Florida Polytech Professor hopes to inspire women in STEM" – by Yadira Iraheta, Polk County, Published Jun 13, 2019

Grisselle Centeno -Ethics in Engineering -Podcast on Ethics in Engineering September 20, 2019

Work in progress

Reeves Kingsley, Hernandez-Gantes V. Gushi G., and G. Centeno, "Constructivism in Engineering Education and Students' Motivation to Learn" in preparation for submission to *Journal of Engineering Education*

Florentino Rico, Grisselle Centeno, Ludwig Kuznia, Steven A. Eschrich and Javier F. Torres-Roca, "Prediction of Response to Radiation Therapy Using Gene Expression Profiles", in preparation for submission to *IISE Transactions on Health Systems Engineering*

G. Centeno, L. Kuznia, B. Zeng, B. Decker, V. Decker and D. Decker, "Predicting Response to Chemotherapy in Stage IV Breast Cancer Patients Using Data Mining Techniques with EMR Data" under review *IEEE Transaction on Biomedical Engineering*

G. Centeno, S. Lai-Yuen, I. Nekoeimehr and S. Mithy, "Healthcare Related Interventions to Increase Engineering Students' Motivation and Female Retention" – in preparation for submission to *Journal of Engineering Education (JEE)*

M. Davila, G. Centeno, "A surgical library for scheduling operating rooms", in preparation for submission to *OR for Healthcare*

M. Davila and G. Centeno, "Impact of back-to-back surgeons scheduling in operating room's turnover times", in preparation for submission to *International Journal for Quality in Healthcare*

A. Fabregas and G. Centeno, "A mathematical programming approach for multimodal network design decision making" in preparation for submission to *Journal of regional science*

A. Fabregas and G. Centeno, "Solving Nonlinear Network Problems through Piecewise Linear Approximations" in preparation for submission to *Computers and OR*

TEACHING ACTIVITIES

Courses Taught

Healthcare Systems Engineering (graduate and undergraduate)

Operations Research (graduate and undergraduate)

Multivariate Optimization (graduate)

Production Control (graduate and undergraduate)

Engineering the Supply Chain (graduate)

Probability and Statistics for Engineers (graduate and undergraduate)

Engineering Economics (undergraduate) and Advanced Engineering Economic Analysis (graduate)

Work Design and Analysis (undergraduate)

Operations Research for Engineering Managers (graduate)
 Special Optimization Topics: Graduate Research Seminar
 Facilities Design II (undergraduate)
 Data Analytics (College of Medicine)

Dissertations and Theses Directly Supervised *

	Ph.D. Student	Dates of Service	Function
1	Luis D. Otero	Fall 2003- 2010	Director
2	Nick Coblio	Fall 2004 – 2011	Co-Director
3	Aldo Fabregas	Spring 2004- Fall 2012	Director
4	Ludwig Kuznia	Summer 2009- May 2012	Director
5	Marbelly Davila	Spring 2008- May 2013	Director
6	Serkan Gunpinar	August 2011-August 2013	Director
7	Florentino Rico **	Fall 2009- Summer 2014	Director
8	Balaji Ramadoss	Fall 2013 – 2015	Co-Director
	Master Student	Dates of Service	Function
1	Sandeep Iyer	Fall 2001-Fall 2003	Director
2	Rajesh Chaudhary	Spring 2002-Fall 2003	Director
3	Alejandro Carbo	Summer 2002-Spring 2003	Director
4	Vikram Bhide	Fall 2002-Spring 2005	Co-Director
5	Anitha Eranki	Fall 2002-Spring 2004	Director
6	Daniel Rojas ***	Fall 2004- Fall 2006	Director
7	Paula Lopez	Spring 2003-Spring 2005	Director
8	Florentino Rico **	Fall 2007- Summer 2009	Director
9	Brittany Clift	Fall 2017 – Fall 2019	Co-Director
10	Priyanka Prayagai	Summer 2018 – Fall 2018	Director
11	Maile Sinclair	Summer 2018 – Fall 2018	Co-Director
12	Tamara Rosario	Summer 2018 – Fall 2018	Director
13	Sharmin Mithy	Fall 2015 – Fall 2019	Director
14	Joshua Olabisi	Spring 2019- Fall 2020	Director
15	Jordan Jernigan	Spring 2021-Fall 2021	Director
16	Somayeh Sadeghizadeh	Spring 2021-Fall 2021	Director
17	Jean Menieur	Spring 2021-Fall 2021	Director

* **Dr. Centeno has also participated as a committee member for other 25 theses/dissertations.**

** *Recipient of USF Latino Award - Awarded in 2009*

*** *Recognized as the USF Outstanding Master Thesis - Awarded in 2007*

REU Students Sponsored

Name of Students					
1	Yasmin Palacio	8	Julian Montenegro	15	Di Li
2	Daniel Rojas †	9	Kelly Boyden	16	Audra Banaszak
3	Mickey Arruda	10	Nangellie San Inocencio	17	Ashley Ishak
4	Keisha Minatee	11	Nyree Karmody	18	Carolina Giron
5	Kiara Perez-Blanco	12	Noelia Gonzalez	19	Carolina Gushi
6	Scott Wilkinson	13	Maria Rodriguez	20	Daniela Valdivieso
7	Roberto Perez-Blanco	14	Garrett Bowleg	21	Clarissa Arriaga

† *Honorable mention award at College Competition*

INSTITUTIONAL AND PROFESSIONAL SERVICE ACTIVITIES

- Research Experience for Undergraduates (REU) program coordinator, Fall 2001- Spring 2019 – responsibilities include facilitation interactions between faculty and undergraduates, following up on research adequacy and goals and verification of research program student compliance.
- ABET coordinator for IMSE – and representative to the College ABET committee, 2015-present
- SACS coordinator for IMSE – Undergraduate program (BSIE), 2015- present
- IMSE Recruitment Committee, Director, 2011-present
- COE Senator Representative, USF Faculty Senate, 2007-2010
- Faculty advisor for the Society of Hispanic and Professional Engineers, Fall 2001- 2008
- Research Experience for Undergraduates (REU) program coordinator, Fall 2001- present
- McNair Scholar Research Faculty Advisor, May 2002 – 2007
- IIE Board of Directors, Operations Research Division National Organization, 2004- 2009
- IIE OR-Division presidential positions 2007-2009
- Reviewer for IJPR, Computers and IE, IEEE in Semiconductor, Computers and OR, IEEE Robotics and Automation, Mathematics and Computer Modeling, J of Public Transportation, Transportation Research Board, Applied Mathematical Modelling, J of Planning and Scheduling
- McNair Scholar Research Faculty Advisor, May 2002 – 2005
- McNair Scholar Mentor, October 2001 – 2005
- I.E. Undergraduate Committee, Fall 2001 - present
- College Minority Committee, Fall 2001- present
- USF IMSE Department, "ABET- Survey Committee," Spring 2001 – Spring 2002
- USF IMSE Department, "Engineering Management Committee," August 2000- August 2002

PERSONAL

Fluent in English and Spanish

Curriculum Vitae—Jim Dewey—January 2015

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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 Koochi and Belen Chavez)
- 5) Teacher Attrition and Alternative Teacher Certification Programs. (With Natalia Pakhotina)
- 4) Funding Desequalization – 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 UF's 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 (AHPARC) 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**
January 2013 – December 2013
Department of Mathematical Sciences
Courses taught: MATH 2301 Mathematics for the Social Sciences II
- **Research Assistant** **The University of Texas at El Paso**
January 2009 – January 2013
Department of Mathematical Sciences
Computational Science Program, for the Army High Performance Computing Research Center (AHPARC) 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**
July 2012
Research and Innovation Geophysics Department
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**
June 2011 – August 2011
Research and Innovation Geophysics Department
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**
Fall 2008 and Fall 2009
Department of Mathematical Sciences
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.**
January 2007 – June 2008
Department of Mathematical Sciences
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**
May 2013
El Paso, TX. United States
 - 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**
May 2011
El Paso, TX. United States
 - 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**
May 2008
Cali, Valle. Colombia
 - 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 (ICCD 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 ℓ_1 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 Yashin 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).

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. 3/4, 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 Ghorashyzaheh, "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 – Trivison 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 Delcours, 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, Hungary 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 Ghorashyadeh, “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 Khelifaoui, "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 Brooks, 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 and Tom 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 Reeve, 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

**Florida Polytechnic University
Board of Trustees
Academic & Student Affairs Committee
February 9, 2022**

Subject: Approval of the Proposed 2022-23 Academic Calendar

Proposed Committee Action

Recommend approval of the proposed final 2022-2023 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 provides the BOG with two years in advance.

Background Information:

The dates noted on the following page for the 2022-23 Academic Year Calendar were previously approved by the Board on April 26, 2021, as tentative dates to reflect the campus returning to pre-COVID operating conditions. As we have returned to regular operations, these dates have not changed and are now being requested for Board approval for filing with 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 slightly different than last year, to include the additional dates for Resident Move-in and Move-out.

Supporting Documentation: Proposed Final 2022-2023 Academic Calendar

Prepared by: Dr. Terry Parker, EVP & Provost

2022-2023 Academic Year Calendar Dates

Term	Activity/Event	Start Date	End Date (If Applicable)
Fall 2022	Resident Move-In	8/19/2022	
Fall 2022	First Day of Classes	8/23/2022	
Fall 2022	Breaks - <i>Labor Day Holiday</i>	9/5/2022	
Fall 2022	Breaks - <i>Veteran's Day Holiday</i>	11/11/2022	
Fall 2022	Breaks - <i>Thanksgiving Holiday Break</i>	11/23/2022	11/26/2022
Fall 2022	Last Day of Classes	12/7/2022	
Fall 2022	Final Examinations	12/10/2022	12/15/2022
Fall 2022	Commencement	5/7/2023	
Spring 2023	First Day of Classes	1/9/2023	
Spring 2023	Breaks - <i>Martin Luther King Jr. Holiday</i>	1/16/2023	
Spring 2023	Breaks - <i>Career Day</i>	2/14/2023	
Spring 2023	Breaks - <i>Spring Break</i>	3/4/2023	3/12/2023
Spring 2023	Last Day of Classes	4/26/2023	
Spring 2023	Final Examinations	4/29/2023	5/4/2023
Spring 2023	Resident Move-Out	5/6/2023	
Spring 2023	Commencement	5/7/2023	
Summer "A" 2023	First Day of Classes	5/15/2023	
Summer "A" 2023	Breaks - <i>Memorial Day Holiday</i>	5/29/2023	
Summer "A" 2023	Last Day of Classes	6/23/2023	
Summer "A" 2023	Final Examinations	In class	
Summer "B" 2023	First Day of Classes	7/3/2023	
Summer "B" 2023	Breaks - <i>Independence Day Holiday</i>	7/4/2023	
Summer "B" 2023	Last Day of Classes	8/11/2023	
Summer "B" 2023	Final Examinations	In class	
Summer "C" 2023	First Day of Classes	5/15/2023	
Summer "C" 2023	Breaks - <i>Memorial Day Holiday</i>	5/29/2023	
Summer "C" 2023	Breaks - <i>Summer Break</i>	6/26/2023	6/30/2023
Summer "C" 2023	Breaks - <i>Independence Day Holiday</i>	7/4/2023	
Summer "C" 2023	Last Day of Classes	8/11/2023	
Summer "C" 2023	Final Examinations	In class	
Summer "D" 2023	First Day of Classes	6/12/2023	
Summer "D" 2023	Breaks - <i>Independence Day Holiday</i>	7/4/2023	
Summer "D" 2023	Last Day of Classes	8/11/2023	
Summer "D" 2023	Final Examinations	In class	
Summer 2023	Commencement	5/7/2023	

Institution Name:	Florida Polytechnic University
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**Florida Polytechnic University
Board of Trustees
Academic & Student Affairs Committee
February 9, 2022**

Subject: Approval of the Proposed Interim 2023-2024 Academic Calendar

Proposed Committee Action

Recommend approval of the proposed Interim 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 provides the BOG with two years in advance.

Background Information:

The dates noted on the following page for the 2023-24 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 2023 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 Interim 2023-2024 Academic Calendar

Prepared by: Dr. Terry Parker, EVP & Provost

Tentative 2023-2024 Academic Year Calendar

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 - <i>Labor Day Holiday</i>	9/4/2023	
Fall 2023	Breaks - <i>Veteran's Day Holiday (observed)</i>	11/10/2023	
Fall 2023	Breaks - <i>Thanksgiving Holiday Break</i>	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 - <i>Martin Luther King Jr. Holiday</i>	1/15/2024	
Spring 2024	Breaks - <i>Career Day</i>	2/13/2024	
Spring 2024	Breaks - <i>Spring Break</i>	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	5/3/2024	
Summer "A" 2024	Breaks - <i>Memorial Day</i>	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 - <i>Independence Day</i>	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 - <i>Memorial Day</i>	5/27/2024	
Summer "C" 2024	Breaks - <i>Summer Break</i>	6/24/2024	6/28/2024
Summer "C" 2024	Breaks - <i>Independence Day</i>	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 - <i>Independence Day</i>	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	

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