A Collaboration Framework to Advance Hispanic and Low-Income Students' Degree Completion in STEM

AHSIE 12th Annual Best Practices "Virtual" Conference

FT Lauderdale, Florida

(March 8-11, 2020)

Ali Zilouchian; **Director and Professor**
Florida Atlantic University; Boca Raton- FL

Nancy Romance, Ed.D., Professor- Florida Atlantic University

Annie Myers- Broward College, **Dana Hamadeh-** Palm Beach State College

FAU College of Engineering & Computer Science, Florida Atlantic University

Broward College

Palm Beach State College

Presentation Outline

- Research Team and Mentors
- Participated Schools
- A Broader Perspective
- DOE Title III- Project Components
- Project Research Framework
- Summary

FLORIDA ATLANTIC UNIVERSITY

Research Team

Ali Zilouchian, Ph.D.
PI & Project Dir., Assoc. Dean for Academic Affairs, FAU

Nancy Romance, Ed.D.
Co-PI , Professor, FAU

Nurgun Erdol, Ph.D.
Dept. Chair, FAU

Hanqi Zhuang, Ph.D.
Assoc. Chair, FAU

Annie Myers, M.S.
Assoc. Dean of IT, BC

Dana Hamadeh, M.E.,
Assoc. Dean of STEM,
PBSC

Michael Vitale, Ph.D.
Professor, E. Carolina Univ.

Program Coordinators

Jon Stong; MS
HSI Coordinator; FAU

Gerard John-Williams
Project Manager
PBSC

Candice Maharaj, Ph.D.
Program Mgr., BC

Curriculum Refinement Team

Brittanney Amento-Adelmann, Ph.D., *Assoc. Dir. & Adjunct*, FAU

Scott Demsky, Ph.D.
Asst. Professor, & Adjunct, BC

Rainer Steinwandt, Ph.D.
Dept. Chair, FAU

Carrie Stevens, M.S.
Assoc. Professor, PBSC

Jeremy Underwood, M.S.
Asst. Professor, BC

Kyla Williams, Ph.D.
Asst. Professor, BC

Lisa Greenberg, *M.S. Instructor,* FAU

Lee Klingler, Ph.D.
Professor, FAU

Not Pictured:

- Jacques Francois, Asst. Professor, BC
- Alex Opritsa, Professor I, PBSC

FAU: Five Campuses

Student Population (fall 2019): 29,820

FTIC Students: 3191

New Transfers: 3004

College of Eng. & Computer Sci

Student headcount: 2806

Fall 2019 Headcount: 617

272 (44%) Transfer Students

BROWARD COLLEGE

STUDENT POPULATIONN OF MORE THAN 69,000

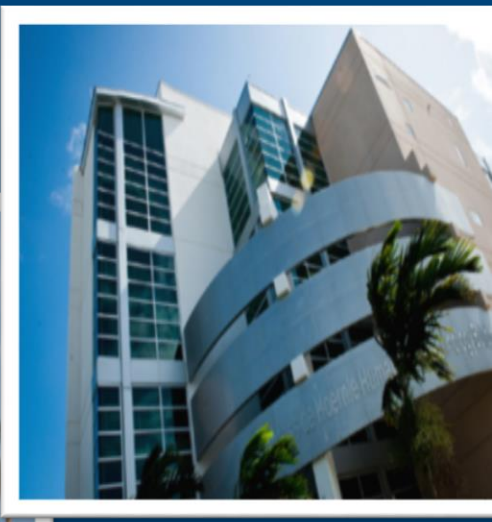
FAU College of Engineering & Computer Science
Florida Atlantic University

Palm Beach State College

Broward College

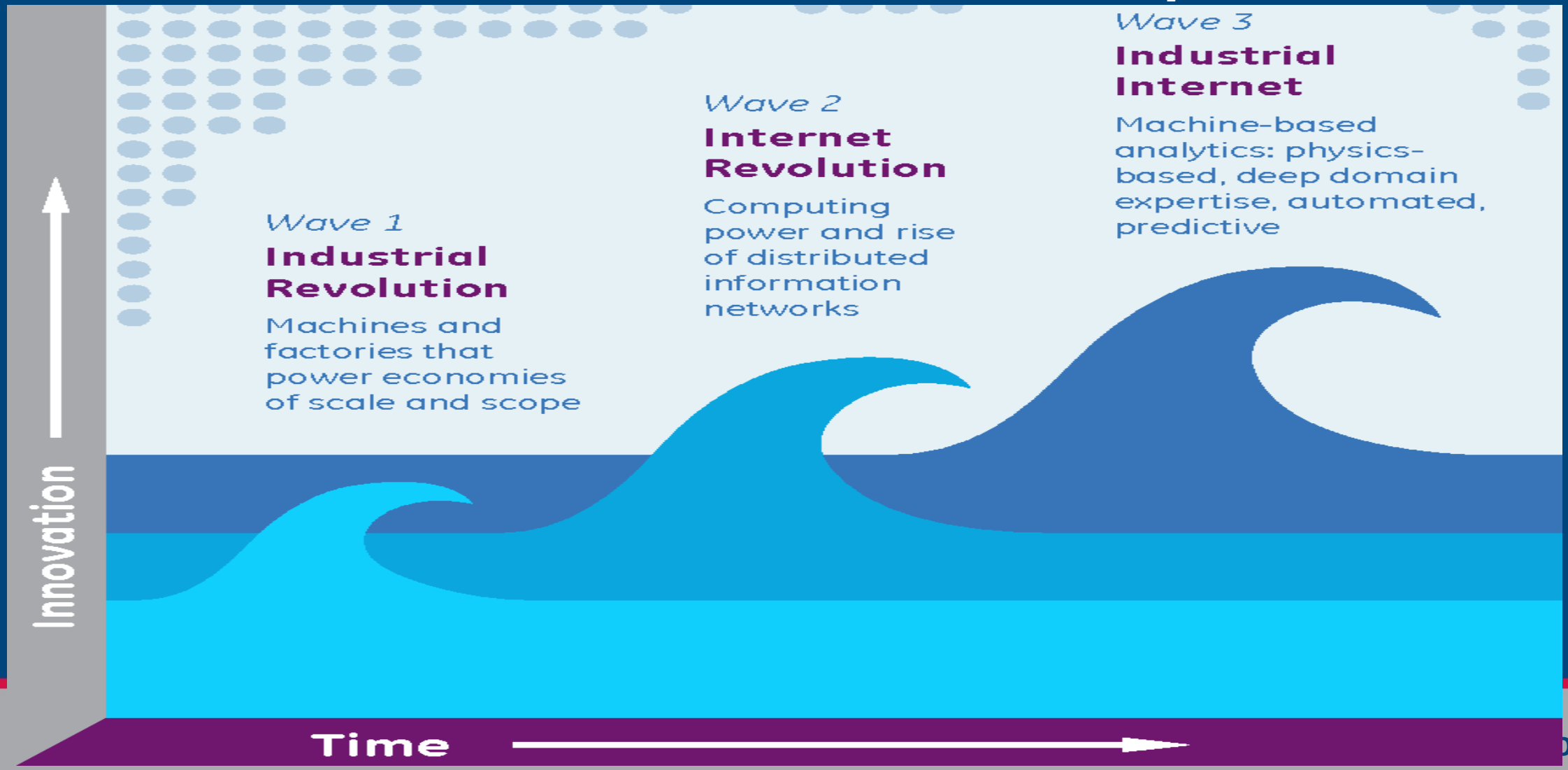
PALM BEACH STATE COLLEGE

FIVE CAMPUSES-STUDENT POPULATION: MORE THAN 49,000



National Science Foundation

National Science Foundation Report



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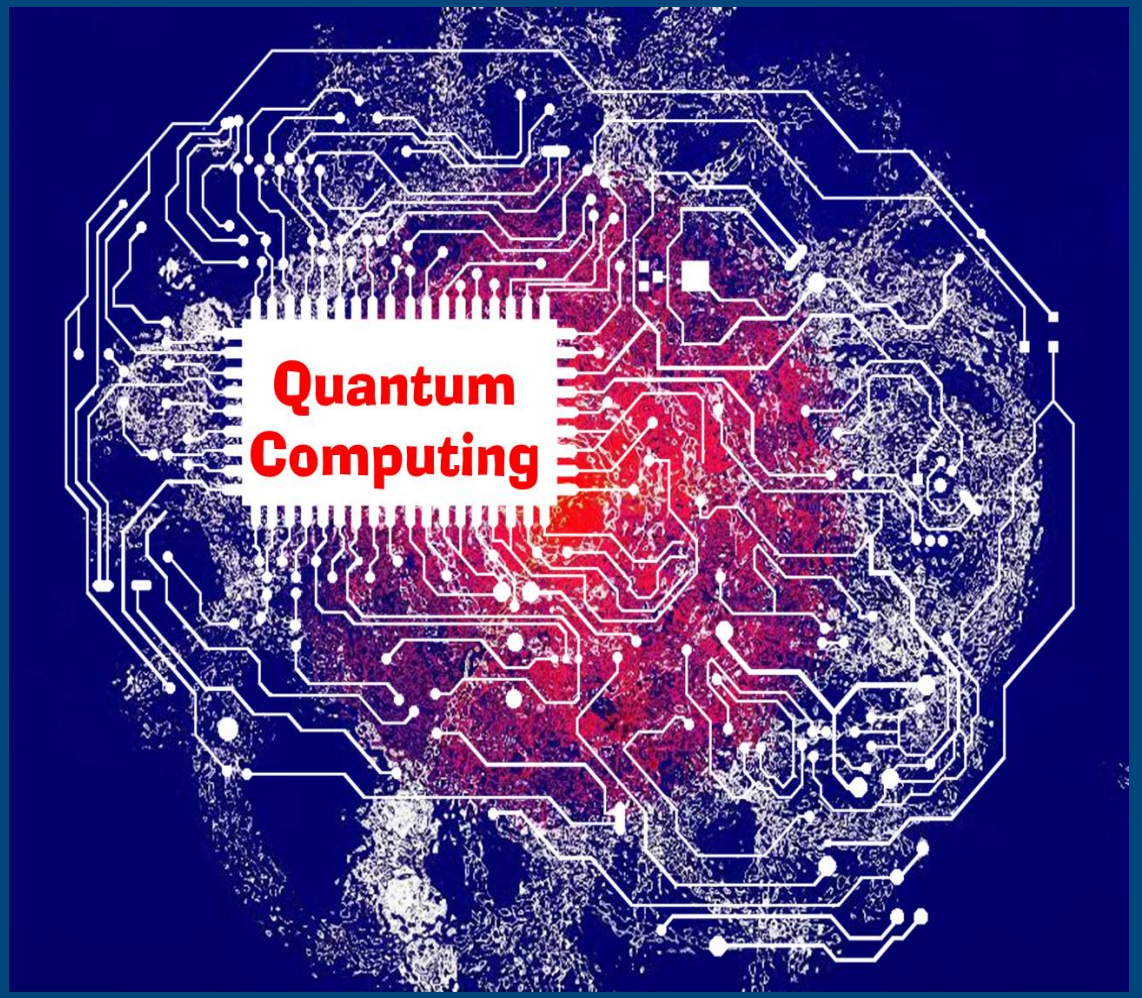
National Science Foundation



National Science Foundation

The Future of Work at the Human-Technology Frontier

- Building the human-technology partnership
- Augmenting human performance
- Illuminating the socio-technological landscape
- Fostering lifelong learning

Information Technology Trends

- Cloud Computing
- 3D Technologies
- Augmented Reality
- High-Performance Computing
- Cyber Security
- Social Networks
- Mobile Systems and Applications
- Bioinformatics and Biotechnology
- and more . . .

They are not in cloud, they are on the 1st floor

Our Cloud Computers

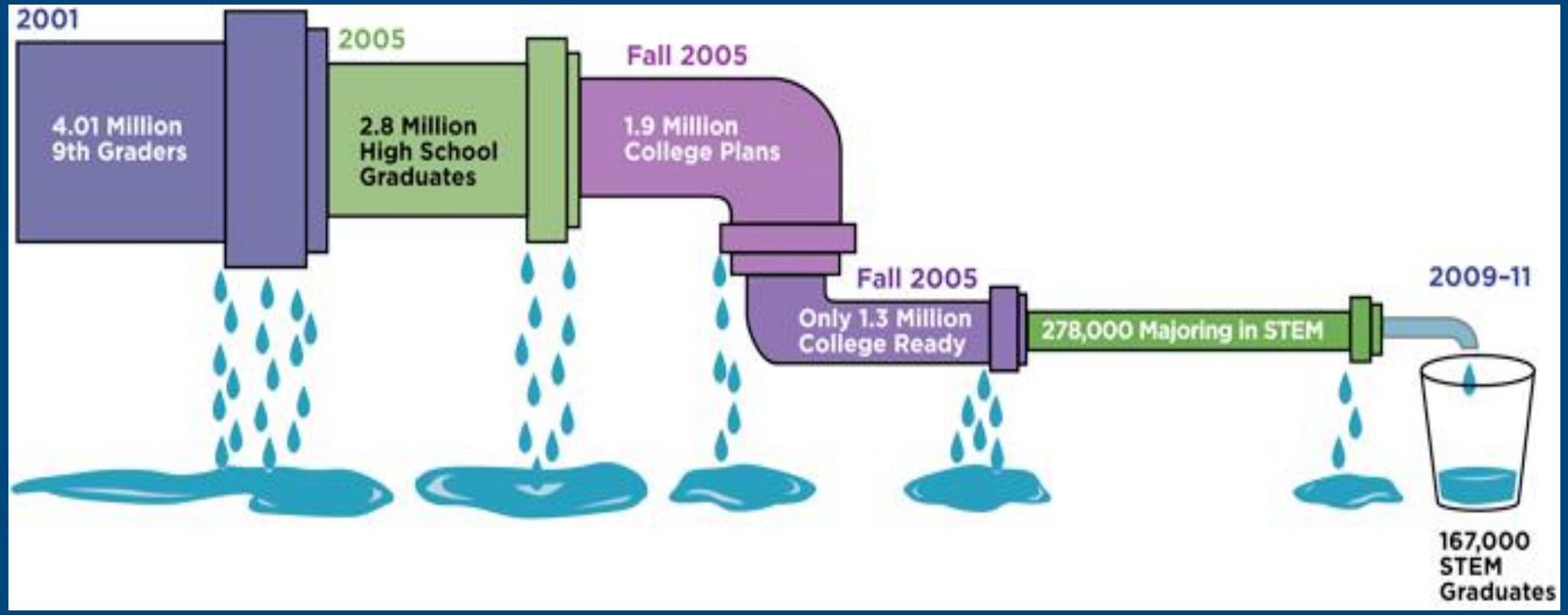
Augmented Reality Technology (ART)

Augmented reality technology - engineering layers of digital information to expand our world. ART doesn't replace reality – It blends the real with the imaginary. This is an expanding field of engineering that fuses many academic fields.

PLEASE SEE INVITED MAGIC LEAP SESSION AHSIE TODAY

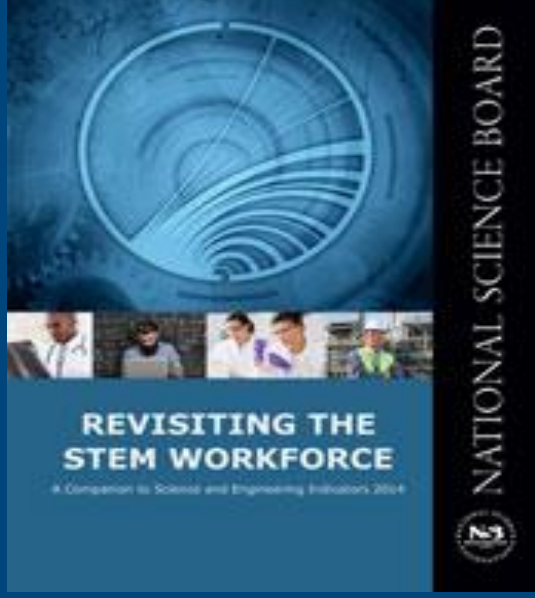
National Trends in STEM Education and Workforce

The Leaky STEM Pipeline



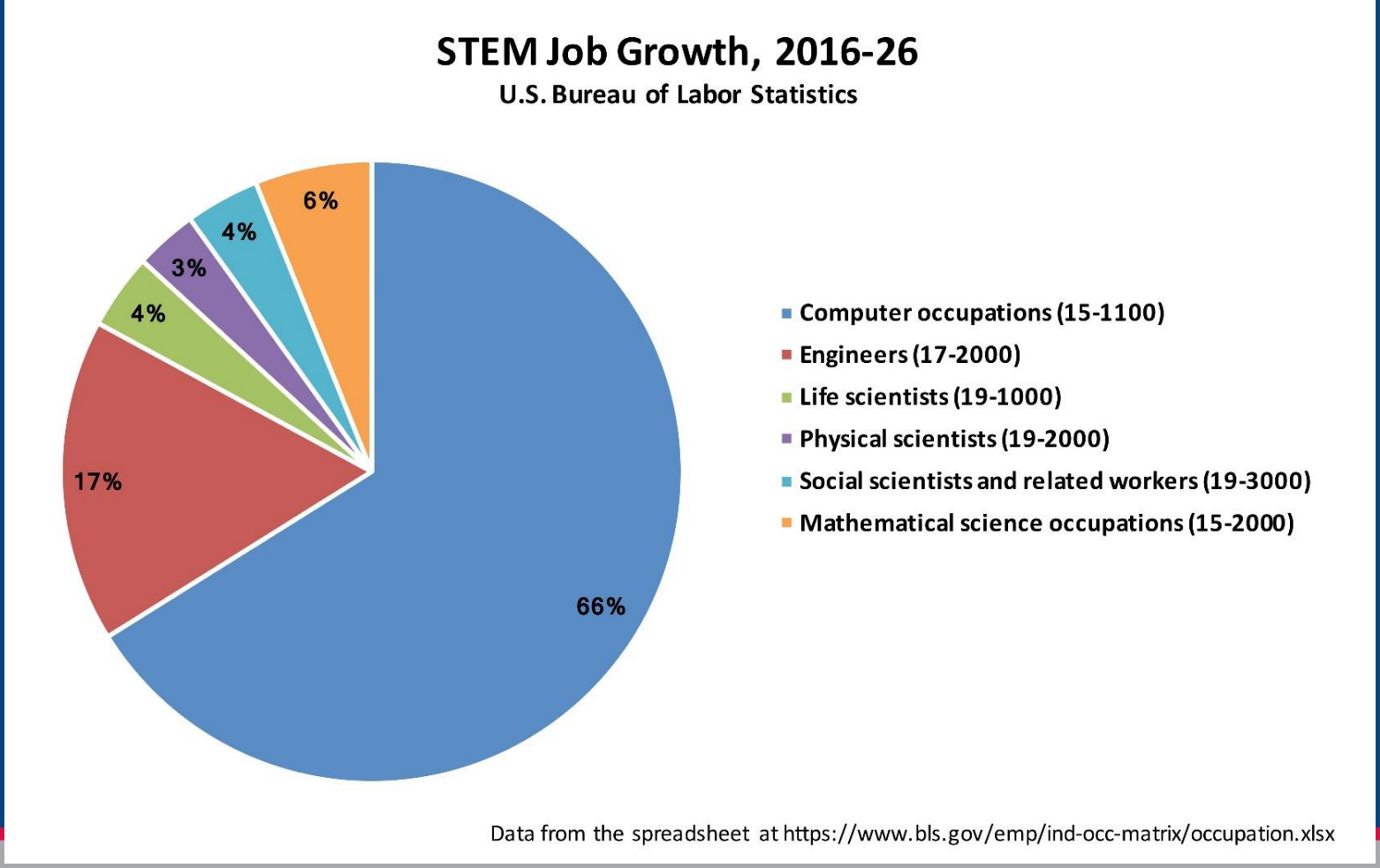
Targeted Occupations Gap Analysis

Board Of Governors Report

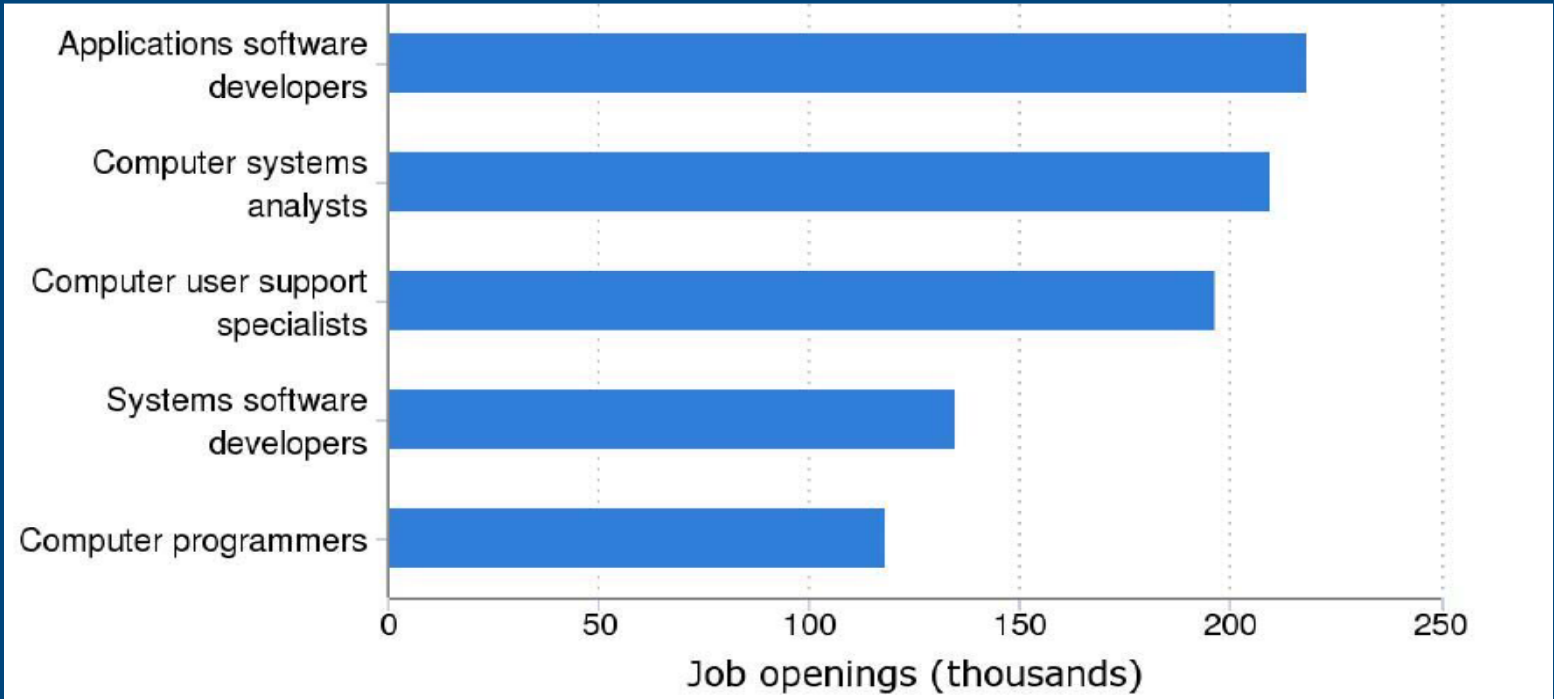


- **Engineering and Information Technology** **2,361**
- **Middle School Teachers** **1,024**
- **Accountants and Auditors** **971**

STEM JOB GROWTH PROJECTION-NATIONAL



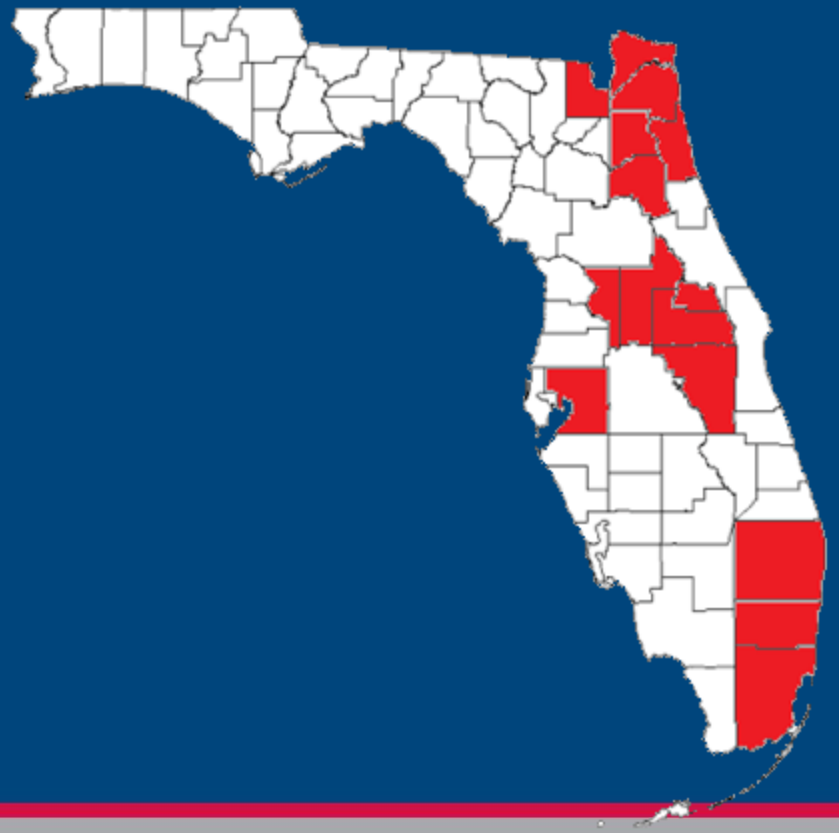
Selected Hot Jobs 2012-2022 (National Level)



Sources: National Association of State Directors of Career Technical Education Consortium (Career Cluster); Bureau of Labor Statistics, Employment Projections program (projected job openings).

FLORIDA ATLANTIC UNIVERSITY

State of Florida
Highest Unfilled Workforce Demand

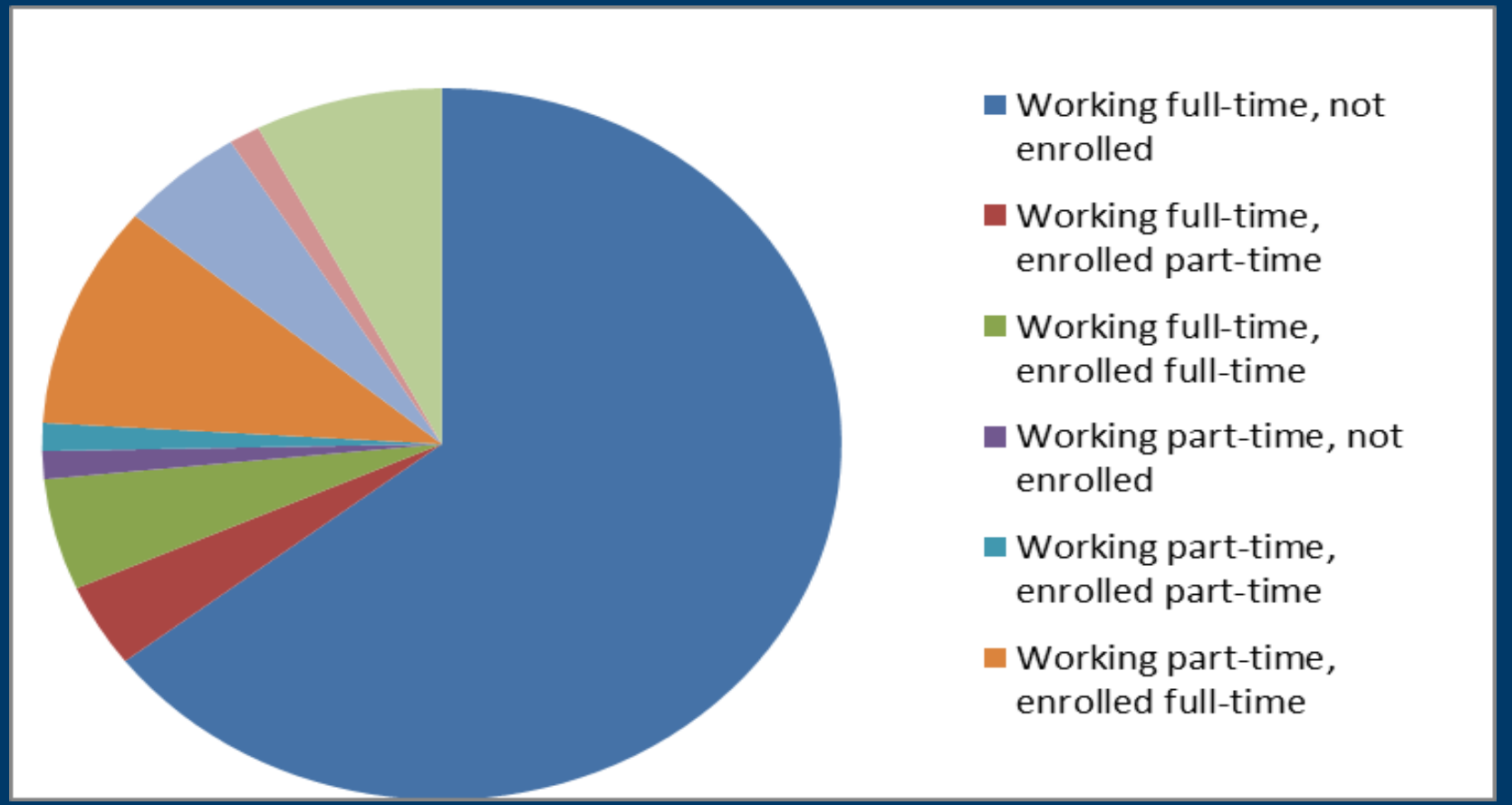


Targeted Occupations Gap Analysis(FLORIDA)

Florida BOG Report

- Information Technology 2,361
- Middle School Teachers 1,024
- Accountants and Auditors 971

Following the Graduates



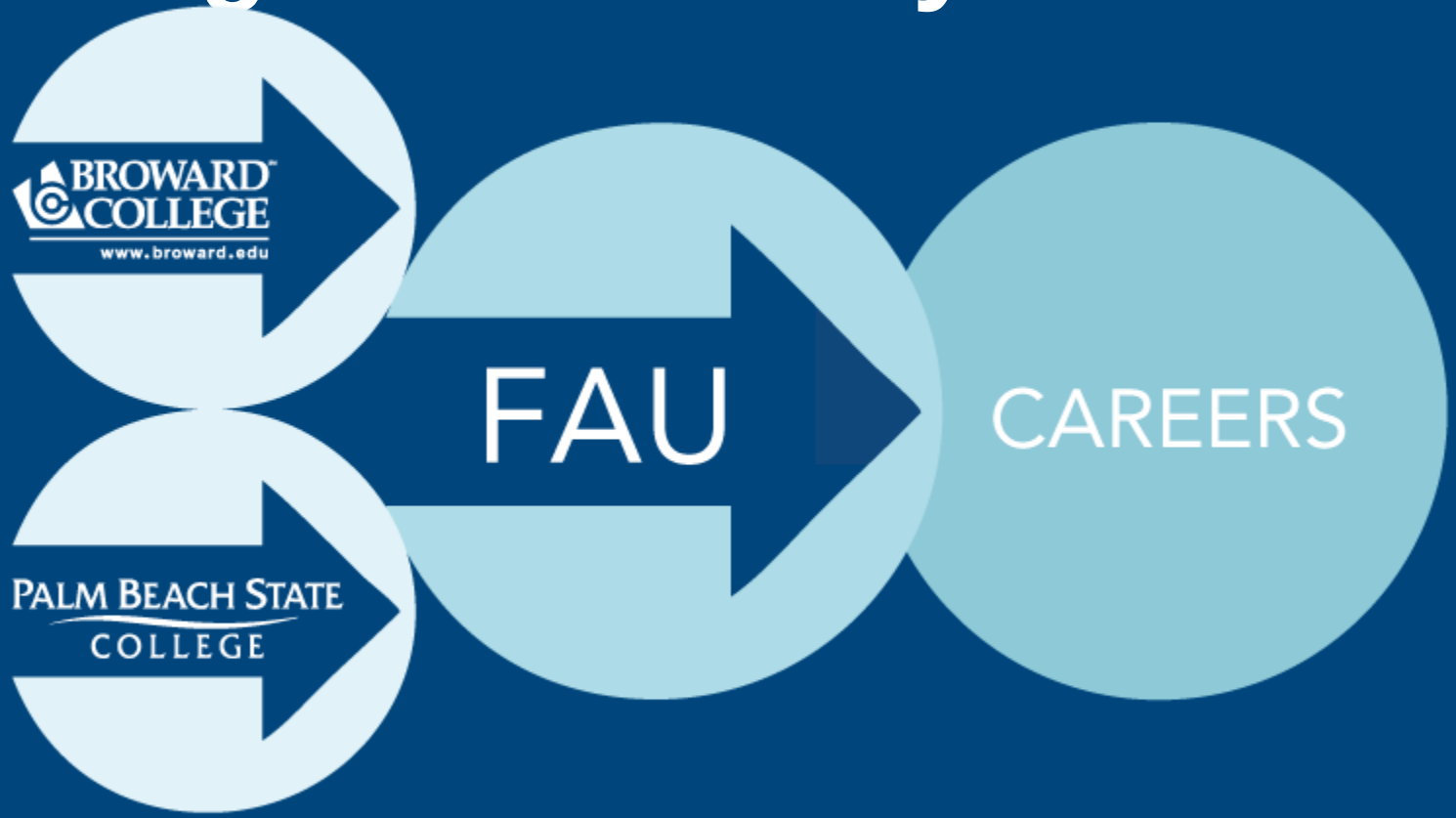
Following our Graduates in CSE

USDOE Title III HSI Framework

Overarching Purpose

Increase the number of Hispanic and low-income state college students who complete their AA degree, transfer to FAU, and complete their bachelor's degree in CS, CE and EE as well as post-degree employment or advanced degree attainment.

Program Pathway



PATHWAY to a SUCCESSFUL CAREER

Search...

HOME | ABOUT | CAREERS | EDUCATION | CURRICULUM | APPLICATION | BENEFITS | PEOPLE | CONTACTS

HSI Title III Project

COMPUTER SCIENCE

Read

COMPUTER ENGINEERING

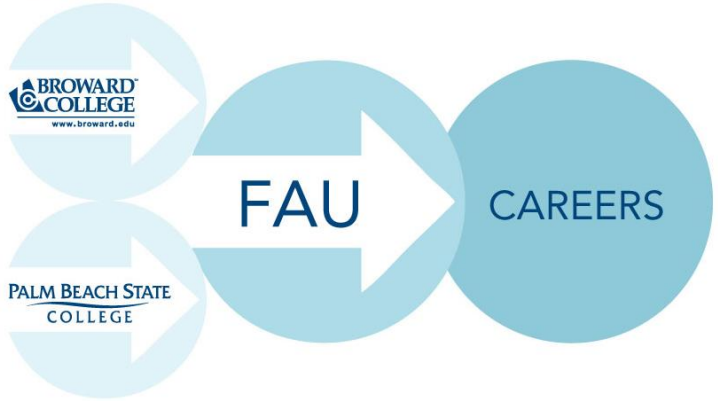
Read

ELECTRICAL ENGINEERING

Read

Florida Atlantic University (FAU), with partners Broward College (BC) and Palm Beach State College (PBSC), has been awarded a grant to provide a 5-year plan of academic and advising/mentor support, industry-related opportunities and career placement for Hispanic and low income students currently enrolled at BC and PBSC, and who are seriously interested in pursuing a bachelor's degree in computer science, computer engineering and electrical engineering at FAU.

The Pathway



Benefits

- enhanced ADVISING
- math/computer TUTORING
- events & WORKSHOPS
- seamless TRANSFERS
- elearning OPTIONS
- co-ops/internships/research OPPORTUNITIES
- learning COMMUNITY

BROWARD COLLEGE www.broward.edu | FAU COLLEGE OF ENGINEERING & COMPUTER SCIENCE Florida Atlantic University | PALM BEACH STATE COLLEGE

Project's Research Framework

Programmatic Challenges

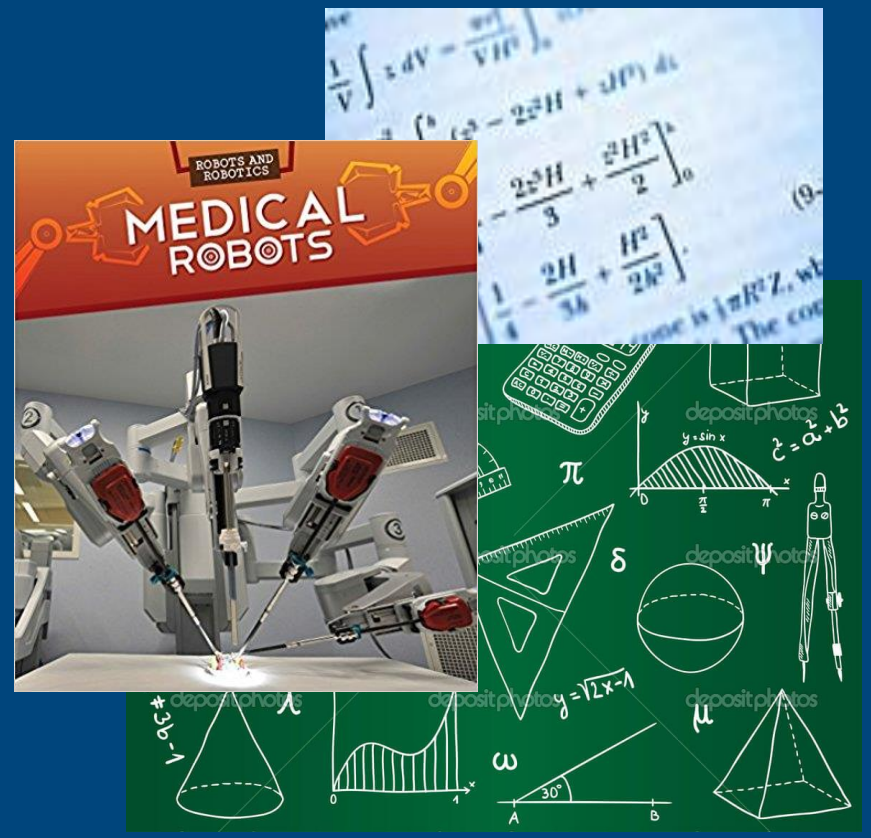
- Student Success Rate in Gateway Courses
- Issues with Retention and Withdrawal - State Colleges
  - Students from the partnering institutions (BC, PBSC) do not complete their AA degree and are unable to transfer to FAU
- Issues with Retention and Withdrawal - FAU
  - Students receiving a DFW grade in Mathematics and Computer Science do not complete their BS degree.

Research Design

- Innovative approaches to remediate learning problems in gateway courses across all institutions.
- Varied student support opportunities and CS/CE/EE career-focused events - geared toward retention and degree completion.

Title III Project Components - BC, PBSC, FAU

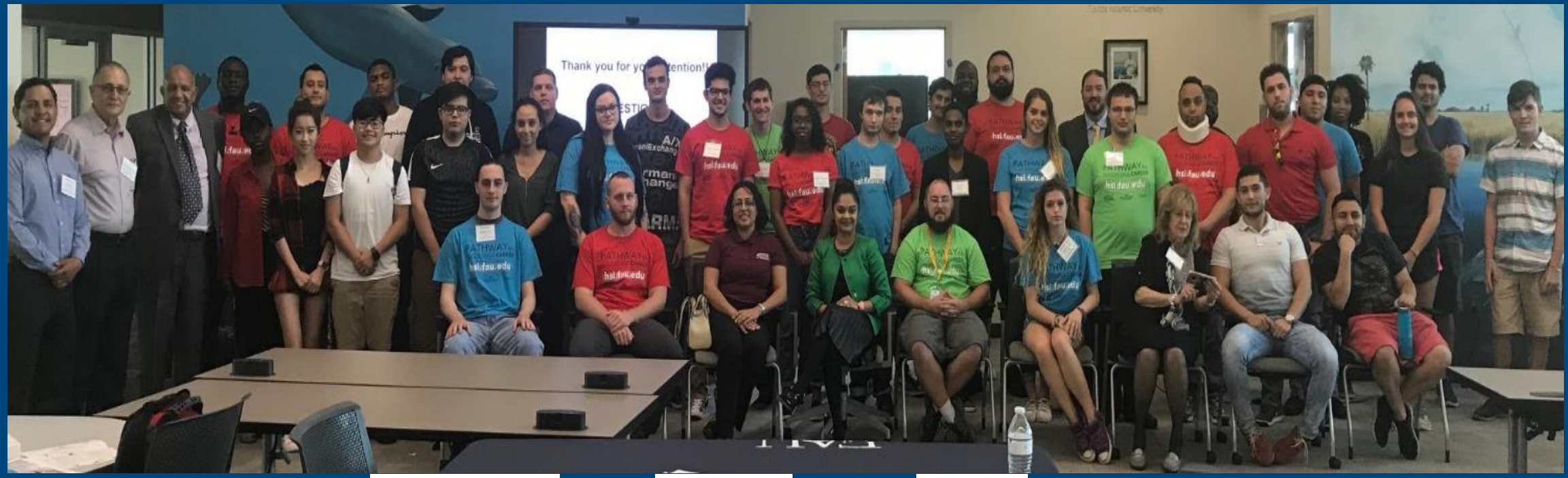
- Curriculum Refinement and Alignment – Gateway Courses
- Collaborating Faculty Partners - Mathematics and Computer Science Faculty
- Participant Recruitment
- Participant Support
- FAU Mentors
- Computer Science Learning Community
- Project Research Areas



Title III Project Components - BC, PBSC, FAU

- Gateway Courses
  - 4 Mathematics
  - 2 Computer Science
- Collaborating Faculty Participants
  - Group Curriculum Meetings
  - Courses – Designated for Project Participants
  - Collaborate with FAU Mentors
  - Collaborate with Project Coordinators
  - Collaborate with Associate Deans

Student Mentors



- **Richard Altamore, CS/CE**
- **Douglas Athenosy**, EE
- **Alona Basko, CS**
- **Therry Beauge**, EE/Finance
- **Avatar Bhola, CE**
- **Paul Birns, CE**
- **Ayah Elshaikh, CS/CE**
- **Alex De Luera, ME**
- **Ivan Maykov, CS**
- **Brian Mclean, EE**
- **David Halle, Civ**
- **Abdul Hanan**, EE
- **Lauren Johnson, Civ**
- **David Patch, CE**
- **Juan Perez, CS**
- **Eric de Souza Piasentin**, CS/CE
- **Saad Saeed, CE**
- **Michael Shanker, CS**
- **Bryan Smith, ME**
- **Nicolas Valenzuela, CS**

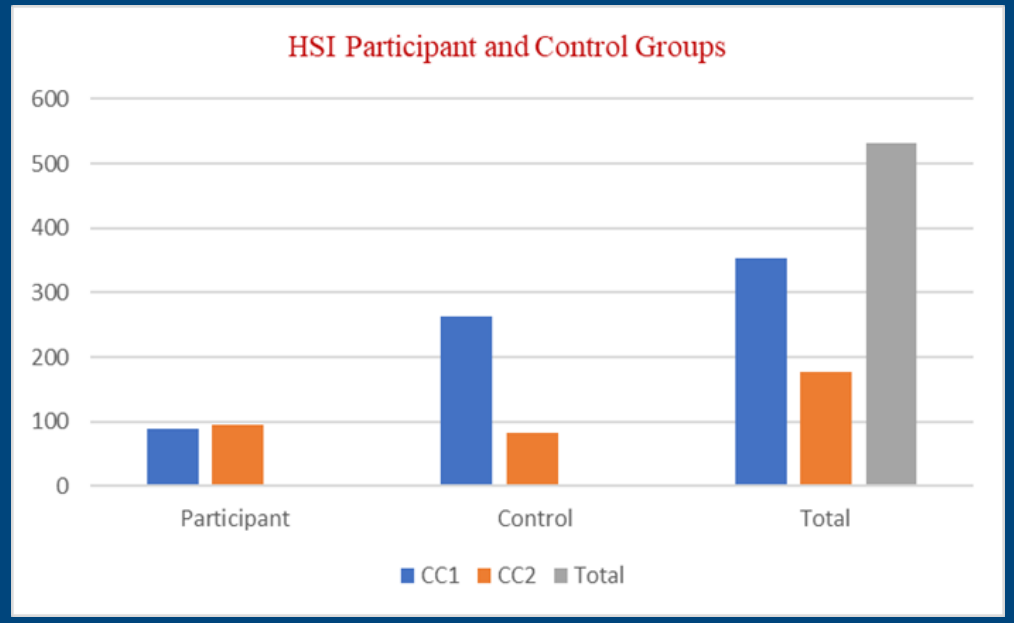
Cohorts I and II Data Analysis

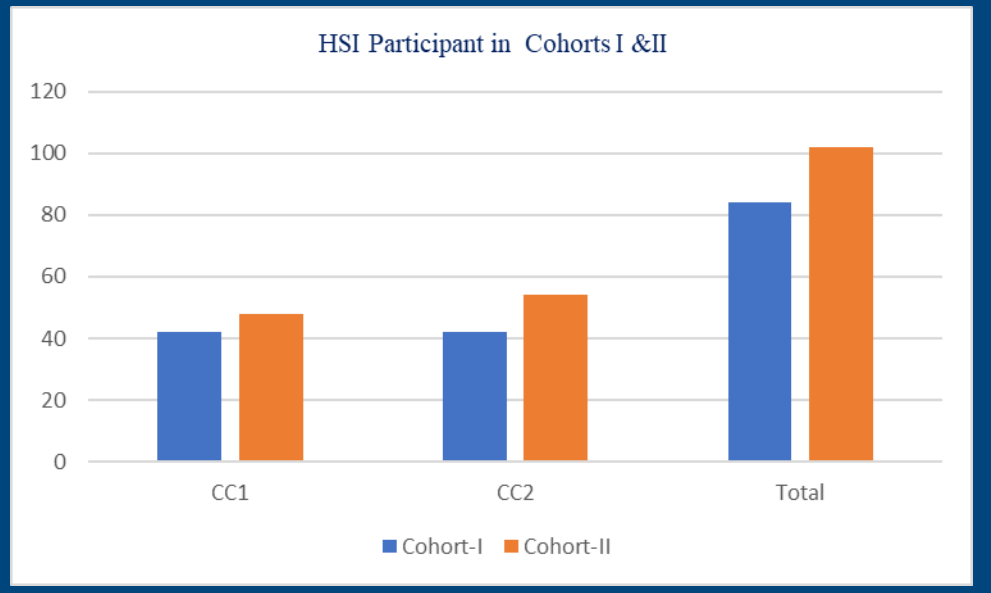
Table 1. *Number and Percent of HSI and Control students Used in Evaluation*

College	Treatment	Number	Percent (Overall)
BC	Participants	90	16%
	Controls	264	49%
PBSC	Participants	96	18%
	Controls	82	15%
Total		532	100%

Table 2. *Number of HSI Participants in Each Cohort*

College	Cohort 1	Cohort 2
CC1	42	48
CC2	42	54



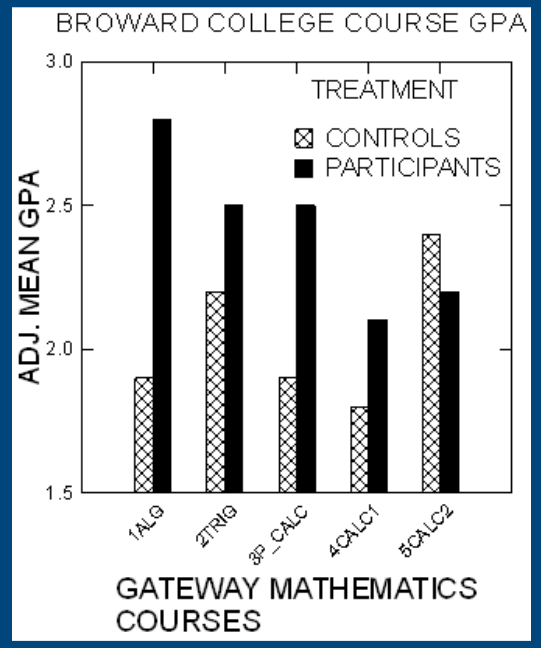


Cohorts I and II Data Analysis

Overall GPA Comparison:

0.42 higher for the participant Cohort

GATEWAY Courses



BROWARD COLLEGE PATHWAY

*TO A **SUCCESSFUL** CAREER*

HSI TITLE III GRANT

Annie Myers, Associate Dean, PMI

Dr. Candice Maharaj, Project Director

ABOUT BROWARD COLLEGE

Our mission at Broward College is *Transforming students' lives and enriching our diverse community through academic excellence, innovation, and meaningful career opportunities.*

Broward College is committed to fostering a learning-centered community that celebrates diversity and inclusion by empowering and engaging students, faculty and staff.

Broward College offers an Associate's of Arts two-year transfer degree, Associate of Science offering specialized training in high demand fields.

This program is intended to transform the lives of Hispanic and low income students by allowing them to obtain a degree in Computer Science, Computer Engineering or Electrical Engineering.

STUDENT RECRUITMENT

Marketing Strategies

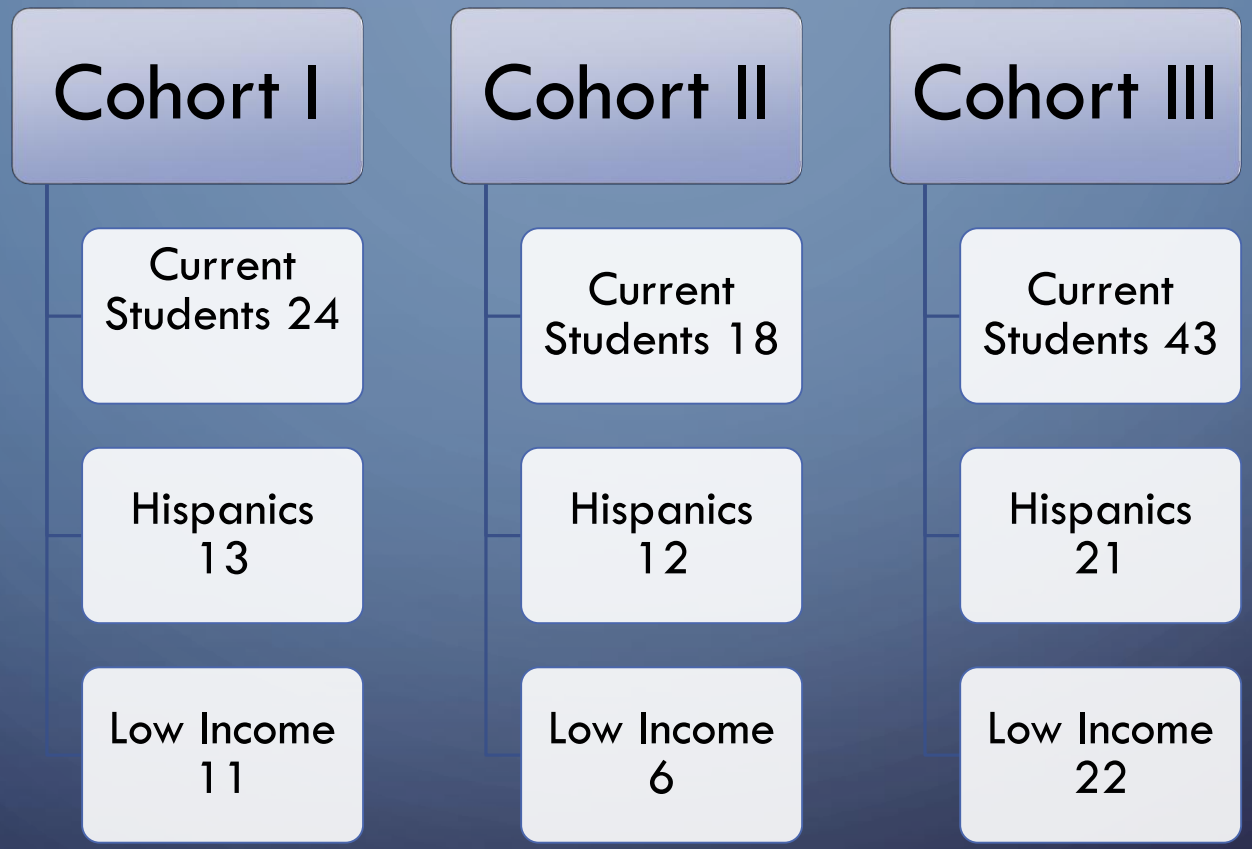
Recruitment Plan

1. Classroom Visits
2. Social Media Marketing
3. Recruitment Emails
4. Seahawk Resource Fair
5. Club Rush Event
6. College Fair
7. Welcome Back BBQ

Create Branding Materials

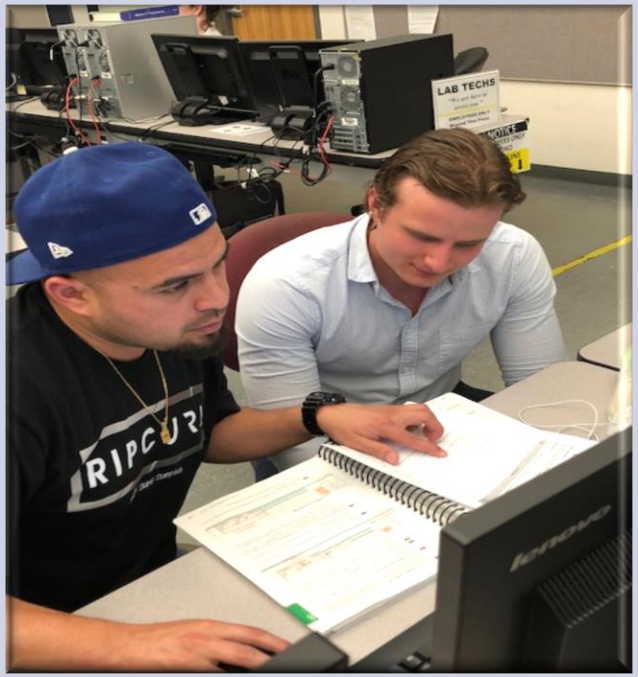
1. Pull up banners and displays
2. PATHWAY Promotional Items
3. BC PATHWAY Website
4. Table Cloths

STUDENT COHORTS



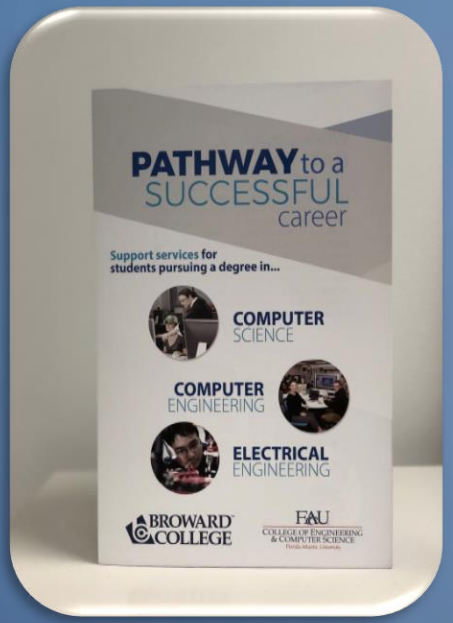
STUDENT SUPPORT ACTIVITIES

Mentoring – Information Sessions



1. Enhanced academic advising
2. Flight plans – CS, CE, EE
3. FAU Math Mentors located in BC Academic Success Center (North and Central)
4. Learning community

MARKETING/PROMOTIONAL ITEMS



STUDENT EVENTS/ACTIVITIES

1. BC Hackathon
2. Open House
3. Meet and Greet with Mentors and Mentees

UPCOMING STUDENT EVENTS/ACTIVITIES

1. **Make an Alexa w/ Raspberry Pi – Summer 2020**
2. **A-MAZE-IN Bot Wars II – Fall 2020**
3. **BC Hackathon Event – Fall 2020**

PALM BEACH STATE COLLEGE

*tres*PATHS PROJECT

An HSI STEM Grant

ABOUT PBSC

4th Largest College of the 28 in FCS

5 Campuses Across PBC

Open-Access Institution

About 50,000 Students

Students from 160+ Countries

Student Profile:

- 35% White
- 32% Hispanic
- 27% Black
- 6% all other

- Variety of Degrees and Certifications

PALM BEACH STATE COLLEGE

*tres*PATHS TEAM

Dana Hamadeh
Associate Dean of STEM – Project Administrator

Gerard John-Williams
*tres*PATHS Program Grant Manager

Kevin Moreau
*tres*PATHS Student Development Advisor

Participating Faculty
4 Mathematics
4 Computer Science

PALM BEACH STATE COLLEGE

*tres*PATHS PARTNERSHIP

Weekly meetings with Project Administrators

Math Faculty monthly meetings with FAU & BC Teams

PBSC and FAU Advisors collaboration & campus visits

PBSC Project Director meetings with FAU & BC Project Administrators and Director

Student and Faculty access to FAU's resources

tresPATHS TARGETED **COURSES**

MATHEMATICS

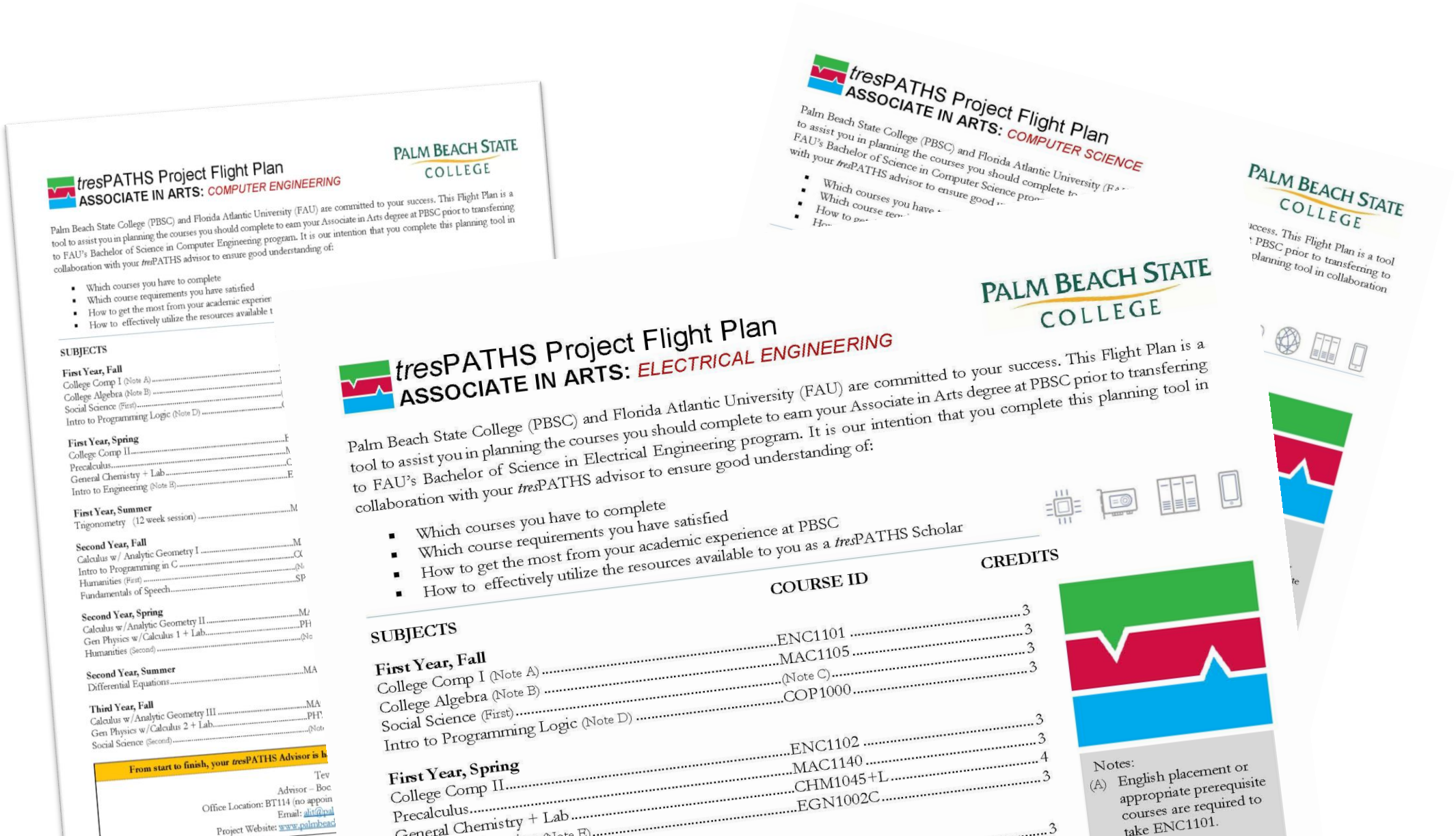
College Algebra
Pre-Calculus
Trigonometry
Calculus I

COMPUTER SCIENCE

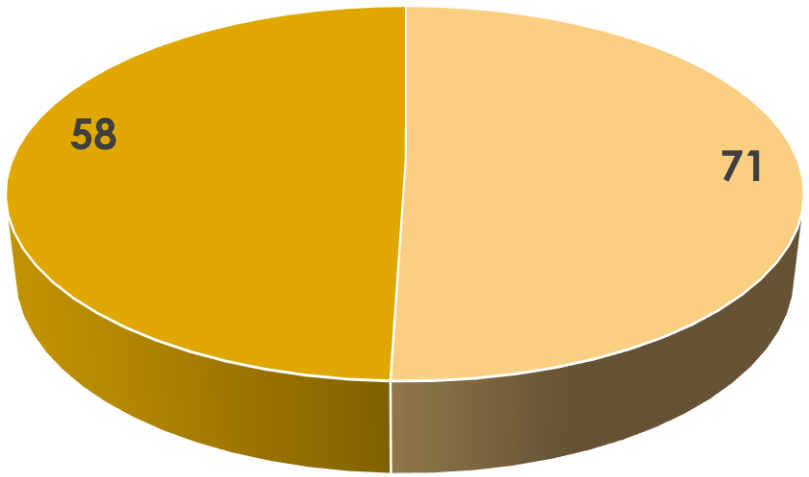
Intro to Engineering
Intro to Program Logic
Object C Programming
Microcomputer Applications
Programing in C++
Programing in Java

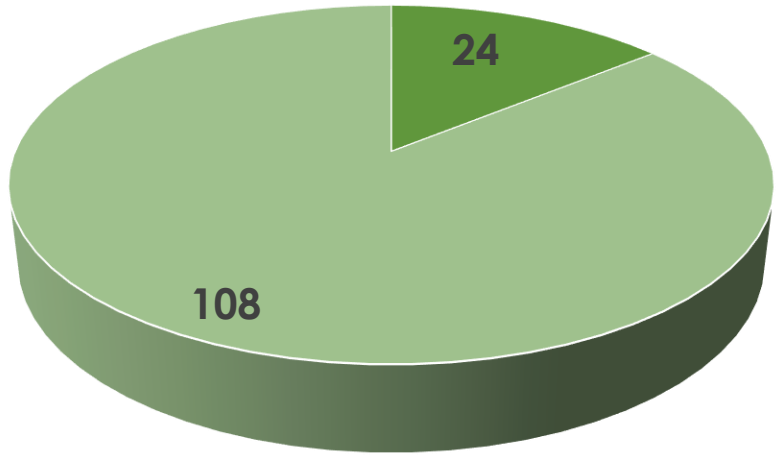
PALM BEACH STATE COLLEGE

tresPATHS FLIGHT PLANS



tresPATHS STUDENT **DATA**





TOTAL STUDENTS
(January 2017 – December 2019)
129

*tres*PATHS EVENT: **OPEN HOUSE & CLUB RUSH**

Interested in Computer Science, Computer Engineering or Electrical Engineering?

*tres*PATHS Open House

Feb. 20, March 20, April 25

12:30PM – 1:30PM

Room: CA109, HT211 (April)

Boca Raton campus

Light refreshments will be provided.

For more information, contact us at:

561-862-4711

hsistemprogram@palmbeachstate.edu

Join *tres*PATHS today!

Requirements

- PBSC student pursuing an AA degree
- Hispanic or low income (per FAFSA)
- At least 18 years of age
- Minimum GPA of 2.5
- Pursuing a B.S. degree in Computer Science, Computer Engineering and/or Electrical Engineering at Florida Atlantic University (FAU) upon completion of AA at PBSC

Benefits

- Designated advisor with enhanced academic plan/pathway
- Free Math and Computer Science Tutoring
- Special invitation to events and workshops
- Seamless transition to FAU's College of Engineering and Computer Science
- And more…

PalmBeachState.edu/programs/**tresPATHS**

*tres*PATHS EVENT: **INFORMATION STATION**

PALM BEACH STATE COLLEGE

tresPATHS EVENTS

PALM BEACH STATE COLLEGE

*tres*PATHS EVENT: **EVALUATOR'S SITE VISITS**

PALM BEACH STATE COLLEGE

THANK YOU!