The Future of Work: Integrating Emerging and Cross-Cutting Technologies: Biotech and Excel

Alexandra Gorgevska
Palm Beach State College

Michael Lesiecki, Co-PI
CORD

Preparing Technicians for the
FUTURE OF WORK
preparingtechnicians.org

CORD
Leading Change in Education

Project Goals

1. Empower community colleges to prepare technicians for the work of the future.
2. Promote regional collaboration between community colleges and industry to determine the technical demands of work of the future.
3. Support ATE Regional Networks focused on technician education for the work of the future.
4. Foster implementation of the cross-disciplinary STEM core to maximize impact on technician education.

What's Happening?

- Nature of work changing at unprecedented speeds
- Technology advancements in machine learning, AI, IoT, and robotics eliminating some jobs, creating others
- Technicians sit at the center of much of this disruption
- Education must keep up
- Our students' career paths will evolve

Preparing Technicians for the FUTURE OF WORK

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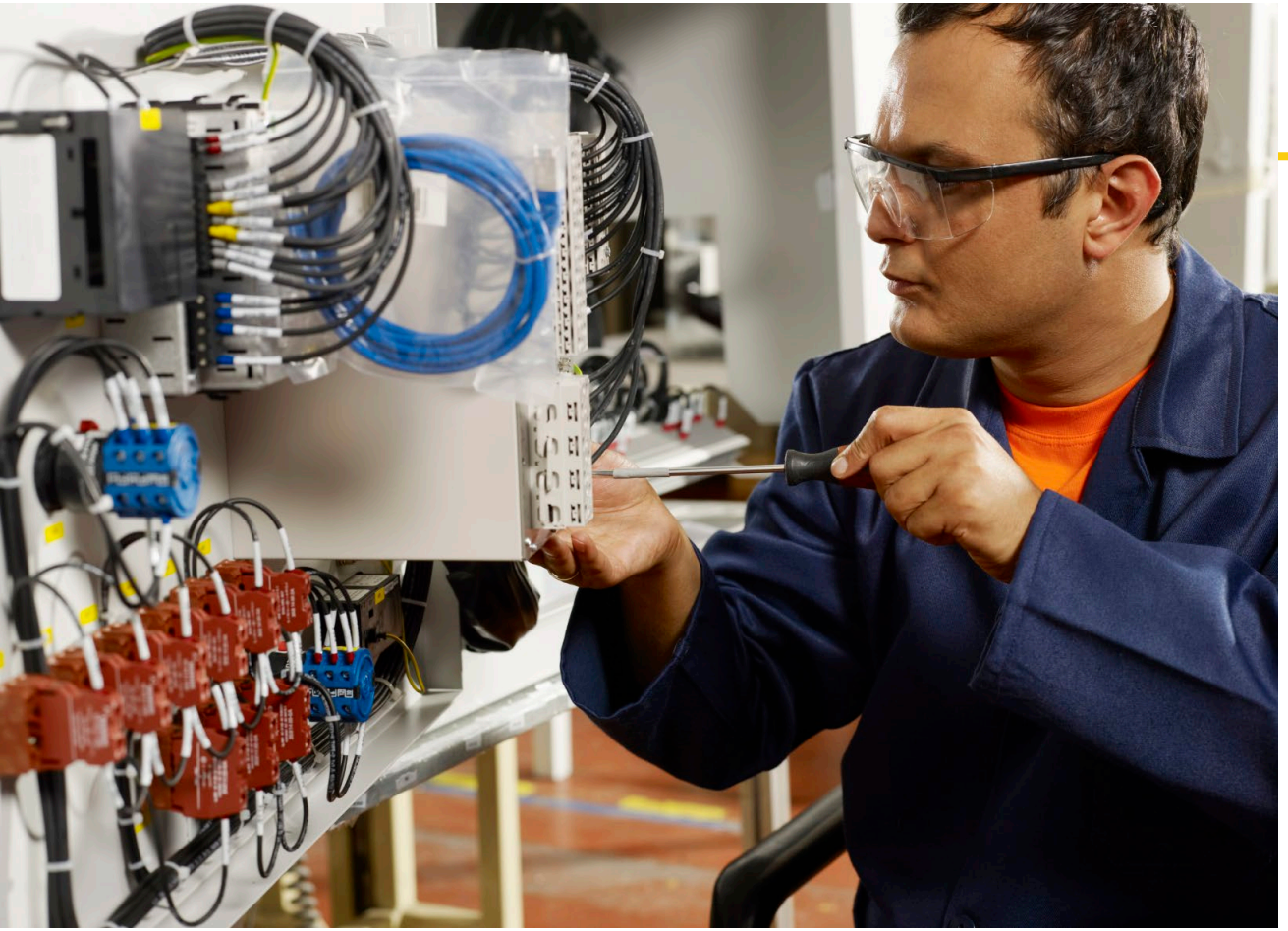
Future-proofing STEM Technicians



The Cross-Disciplinary STEM Core:

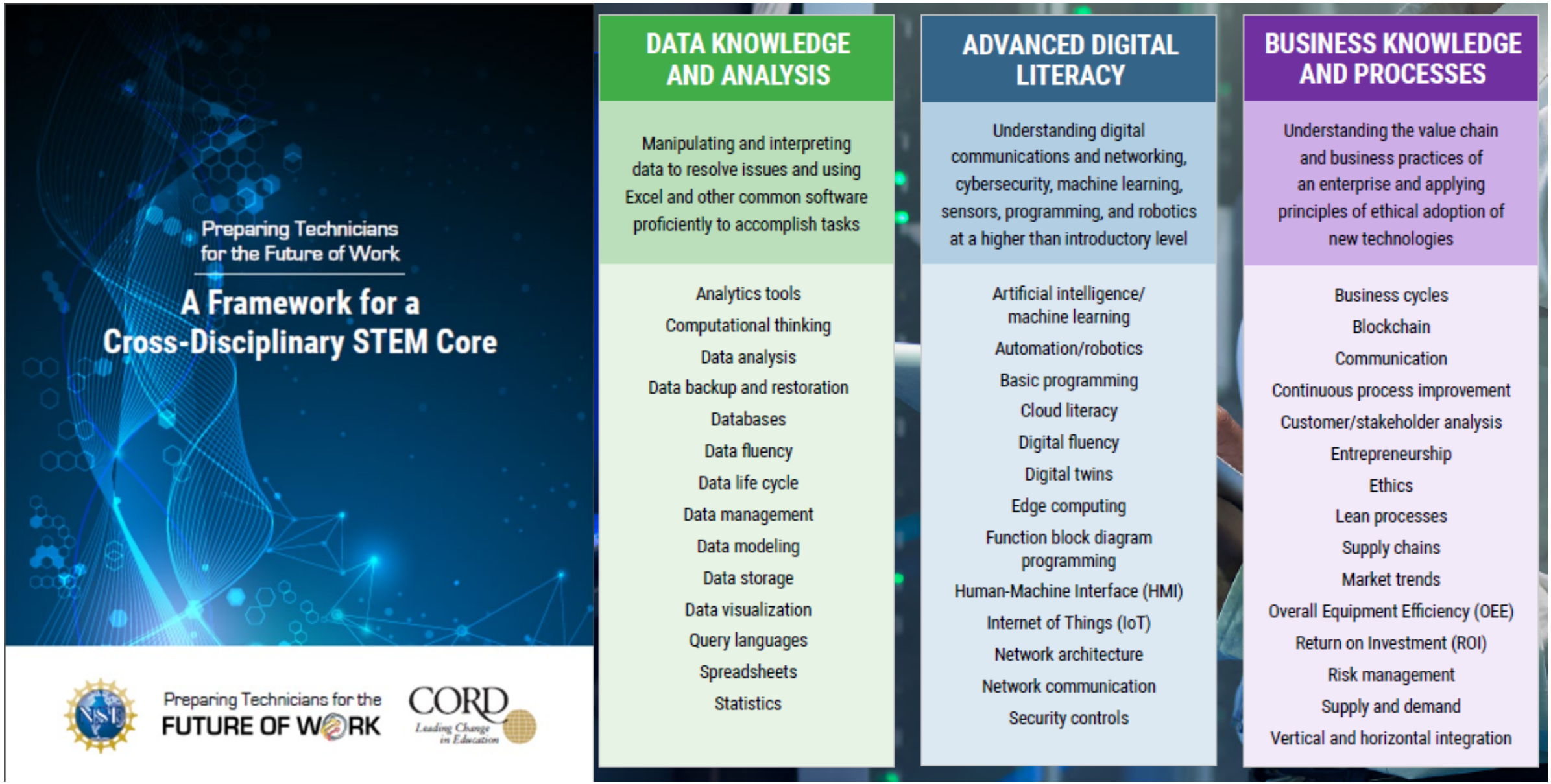
Skill Area 1: Data Knowledge and Analysis

Skill Area 2: Advanced Digital Literacy

Skill Area 3: Business Knowledge and Processes

By Integrating the Cross-Disciplinary STEM Core into Technical Programs

A Framework for a Cross-Disciplinary STEM Core



Alexandra Gorgevska
Palm Beach State College

NSF

Preparing Technicians for the
FUTURE OF WORK
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Leading Change in Education

Palm Beach State College
Biotechnology Program

Preparing Technicians Using
The Framework for A Cross-Disciplinary STEM Core

Alexandra Gorgevska, Ph.D.
Department Chair

PALM BEACH STATE COLLEGE

CORD
Leading Change in Education
Preparing Technicians for the FUTURE OF WORK

Palm Beach State College

Fifth Largest

5th largest of the 28 colleges in the Florida College System. (2020-2021)

Student Profile

35,999 students

• 34% Hispanic • 30% White • 29% Black • 7% all other

Financial Aid

$83 million awarded in financial aid, including scholarships.

Economic Impact On Palm Beach County

• $1.1 billion. For every $1 of spending, students gain $4.60 in lifetime earnings, taxpayers gain $6.30 in added tax revenue and public sector savings, and society gains $19.10 in added state revenue and social savings.

130+ programs of study	**95%** job placement rate in health sciences
5 campus locations	**$83M** awarded in financial aid, including scholarships

PALM BEACH STATE COLLEGE 1933-2023 90

Founded in 1933 as Florida's first public junior college

Who am I and how did I get here?

- B.S. in Biochemistry w/minor in Business Management
  - Biomedical Research Fellowship
    - Dept. of Physiology and Surgery
  - Research Technician
    - Vascular Research Laboratory
- Ph.D. in Biochemistry/Chemistry
  - Analysis of covalent cross-link formation during fixation process
- Post-Doctoral Research Fellowship
  - Rare premature aging disorders

MICHIGAN

Beaumont®
William Beaumont Hospital

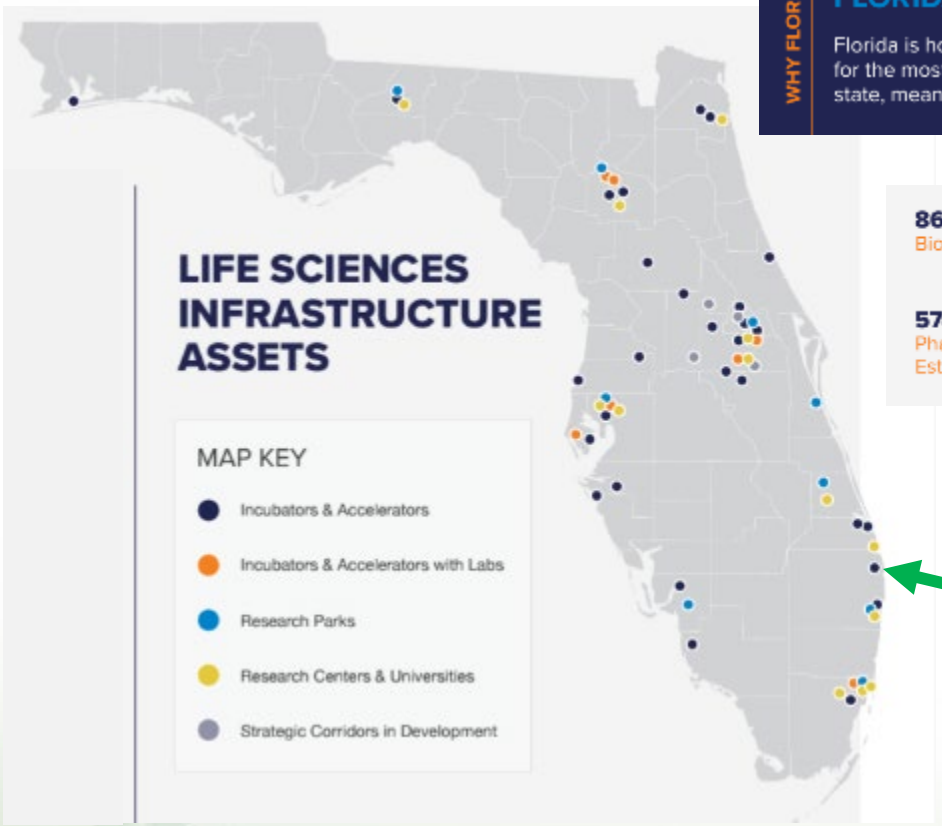
WAYNE STATE UNIVERSITY

NIH
National Institute on Aging

JOHNS HOPKINS MEDICINE
THE JOHNS HOPKINS HOSPITAL

PALM BEACH STATE COLLEGE

Florida’s Life Sciences Cluster



WHY FLORIDA?

WITH A BUSINESS-FRIENDLY ENVIRONMENT AND LARGE INDUSTRY BASE,
FLORIDA HAS THE PRESCRIPTION FOR YOUR SUCCESS.

Florida is home to the nation’s 2nd largest medical device manufacturing industry[1] and is ranked #4 for the most biotech R&D facilities.[2] All of that industry expertise, in a cost-competitive and welcoming state, means that Florida isn't just ready for the future – we are the future.

868 Biotech Establishments[3]	**#2** Largest Medical Device Manufacturing Industry[1]	**#4** Clinical Trials Initiated Among States[10]
574 Pharmaceutical Manufacturing Establishments[3]	**$429+ Million** NIH Funding in 2021[10]	**$1.4 Billion** Annual Life Sciences R&D Spending by Florida Universities[11]

[10] National Institutes of Health, [11] National Center for Science and Engineering Statistics

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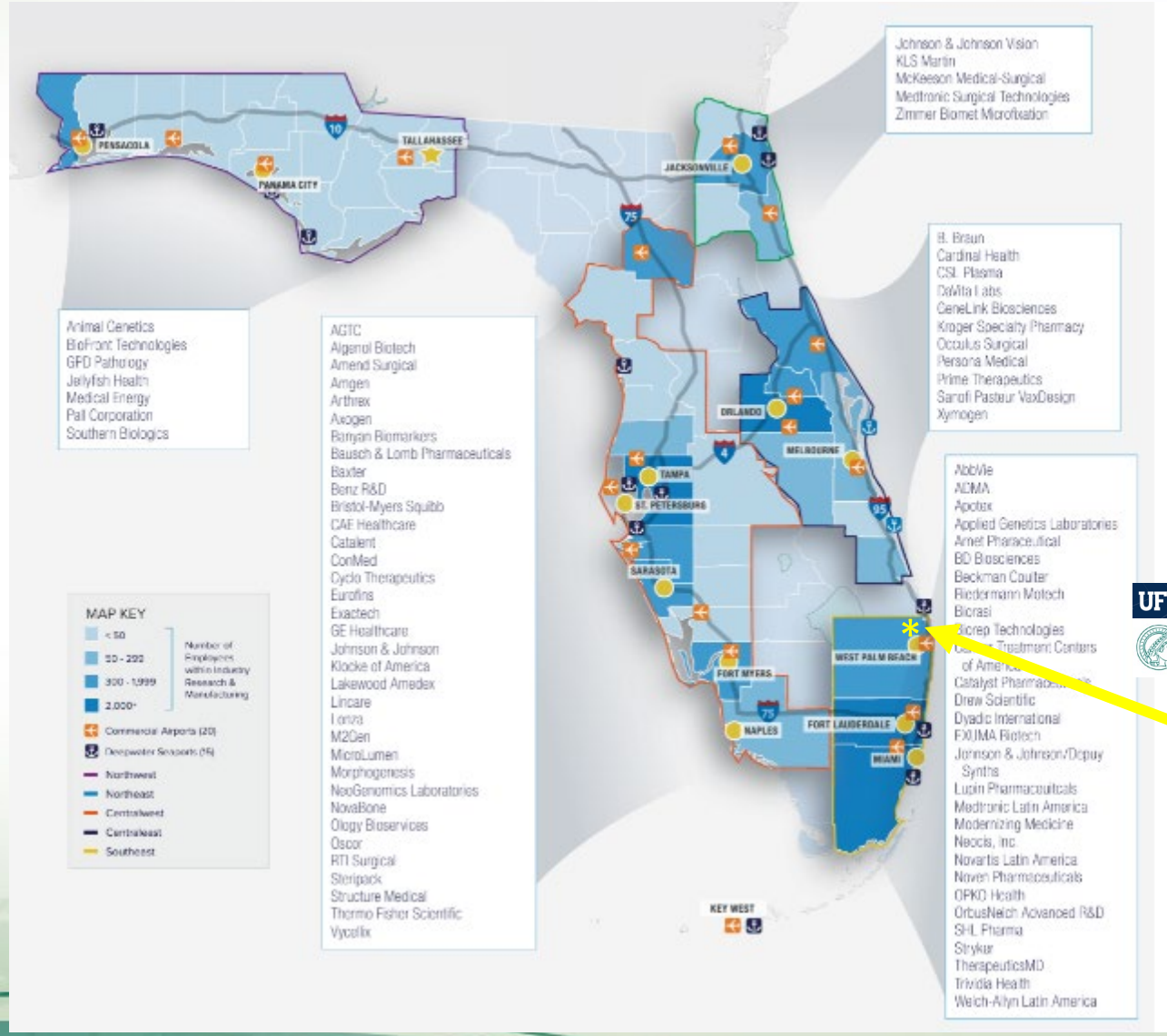
https://www.selectflorida.org/why-florida/industries/life-sciences/

chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.selectflorida.org/wp-content/uploads/life-sciences-industry-profile.pdf

Florida's Life Sciences Cluster



UF The Herbert Wertheim UF Scripps Institute for Biomedical Innovation & Technology

MAX PLANCK FLORIDA INSTITUTE FOR NEUROSCIENCE

PALM BEACH STATE COLLEGE

https://www.selectflorida.org/why-florida/industries/life-sciences/

chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.selectflorida.org/wp-content/uploads/life-sciences-industry-profile.pdf

Biotechnology Program

PALM BEACH STATE COLLEGE

PROGRAM DETAILS

Two Degree Options:

Biotechnology Associate in Science Degree
Program Code 2158 | 61 credits

Dual Associate in Arts/Associate in Science Degrees
A.A. Degree + Program Code 2158 | 75 credits

Two College Credit Certificates:

Biotechnology
Program Code 6159 | 19 credits

Biotechnology Laboratory Specialist
Program Code 6160 | 30 credits

Admission Requirements

- Have a standard high school diploma or GED.
- Complete PBSC application for admission. palmbeachstate.edu/Admissions
- Have cumulative 2.6 GPA in previous college work.
- Attend a mandatory information session. (Scan QR code or visit website below.)
- Pass these required General Education courses with a grade C or higher:

BSC1010/L – Principles of Biology 1 lecture & lab
CHM1045/L – General Chemistry 1 lecture & lab
MAC1105 – College Algebra
ENC1101 – College Composition
BSC2421/L – Intro to Biotechnology lecture & lab

Program Start Dates

Fall or Spring Term (August or January)

Length: A.S. Degree: 2 years full-time/3 yrs. part-time
College Credit Certificates: 1 – 1.5 years

Cost: Florida resident: $101 per credit hour
Nonresident: $363 per credit hour

A.S. Degree: Approx. $6,600 for Florida residents
A.S./A.A. Degrees: Approx. $8,000 for Florida residents
CCC 19 Credits: Approx. $2,000 for Florida residents
CCC 30 Credits: Approx. $3,200 for Florida residents

Financial Aid & Scholarships
palmbeachstate.edu/FinancialAid

QUESTIONS? CONTACT US:

Alexandra Gorgevska, Ph.D., Department Chair
gorgevsa@palmbeachstate.edu | 561-207-5003

Biotech Administrative Assistant | 561-207-5726

Palm Beach State College
3160 PGA Blvd.
Palm Beach Gardens, FL 33410

Biotechnology

Associate in Science Degree
Associate in Arts Degree
College Credit Certificates

Endless Opportunities: A fast-growing global industry that's strong in South Florida!

Biotechnology is the use of biology and chemistry to develop technologies and products that improve our lives and the health of our planet. It drives innovation in many different fields, including pharmaceuticals, biomanufacturing, biomedical and vaccine research, medical device development disease diagnostics, crop improvement, biofuels, and crime scene forensics.

With degree and certificate options, PBSC Biotechnology programs prepare students for rewarding careers and further education through a practical, industry-driven approach

- Gain hands-on laboratory skills in recombinant DNA technology, proteomics, tissue culture, instrumentation and quality assurance/control—all in high demand.
- Excel with small classes and one-on-one interactions with Ph.D.-credentialed faculty.
- Visit local biotech companies and network with prominent professionals.
- Participate in industry research projects.
- Build a solid foundation for your bachelor's degree and easy transfer.

High-Quality Internships

Through our many local industry partners, students get incredible internships geared to their interests.
Sites include:

ADMA Biologics
Akron Biotech
BioTools
Cytonics
Dyadic International
Expansion Therapeutics
Goodwin Biotechnology
FAU Harbor Branch Oceanographic Institute
FAU Pine Jog Environmental Education Center
FAU Stiles-Nicholson Brain Institute
Max Planck Florida Institute for Neuroscience
Somahlution
UF Scripps Biomedical Research
United Clinical Laboratory

ATTEND MANDATORY INFORMATION SESSION VIA ZOOM.

SCAN TO REGISTER FOR INFO SESSION

Multiple Dates Available

https://engage.palmbeachstate.edu/events?categories=14966

Be part of Florida's Future.

South Florida's bioscience industry needs highly trained professionals for cutting-edge jobs. Here are examples of positions, listed by credential.

Positions | Salary Ranges

Certificate or Associate Degree:

Documentation Coordinator
$29,000 - $61,000 | Median: $42,000

Laboratory Automation Specialist
$34,000 - $94,000 | Median: $57,000

Laboratory Research Assistant
$26,000 - $57,000 | Median: $39,000

Laboratory Technician
$27,000 - $50,000 | Median: $37,000

Manufacturing Technician
$27,000 - $49,000 | Median: $36,000

Bachelor's Degree:

Bioinformatics Specialist
$41,000 - $121,000 | Median: $70,000

Forensic DNA Analyst
$41,000 - $97,000 | Median: $60,000

Quality Assurance Specialist
$56,000 - $107,000 | Median: $77,000

Research Associate
$38,000 - $86,000 | Median: $57,000

Sales Representative
$35,000 - $90,000 | Median: $56,000

Sources: Zippia.com and palmbeachstate.emsicc.com

Biotechnology Programs
A.S./A.A. Degree & CCC Course Requirements:

Note: All courses count toward both A.S. and A.A. degrees.

A.S. - Associate in Science Degree
A.A. - Associate in Arts Degree
CCC - College Credit Certificate

COURSE #	COURSE TITLE	CREDIT HOURS	AS/AA DEGREE CCC	30-CREDIT CCC	19-CREDIT
ENC1101	College Composition I	3	•		
MAC1105	College Algebra	3	•	•	
STAT2023	Statistics	3	•		
BSC1010	Principles of Biology I	3	•	•	
BSC1010L	Principles of Biology I Lab	1	•	•	
MCB2010	Microbiology	3	•	•	
MCB2010L	Microbiology Lab	1	•	•	
CHM1045	General Chemistry I	3	•	•	
CHM1045L	General Chemistry I Lab	1	•	•	
CHM1046	General Chemistry II	3	•	•	
CHM1046L	General Chemistry II Lab	1	•	•	
CHM2210	Organic Chemistry I	3	•		
CHM2210L	Organic Chemistry I Lab	1	•		
CHM2211	Organic Chemistry II	3	•		
CHM2211L	Organic Chemistry II Lab	1	•		
Humanities	Any Course	3	•		
Social	Any Course	3	•		
BSC2421	Intro to Biotechnology	3	•	•	•
BSC2421L	Intro to Biotechnology Lab	2	•	•	•
BSC2420	Biotechnology I	3	•	•	•
BSC2420L	Biotechnology I Lab	2	•	•	•
BSC2427	Biotechnology II	3	•		•
BSC2427L	Biotechnology II Lab	2	•		•
BSC2431	Bioinformatics	1	•	•	
BSC2416C	Tissue Culture	2	•		•*
BSC2426C	Biotechnology Instrumentation	2	•		•*
BSC2945C	Biotechnology Internship	2	•		•*
TOTAL CREDIT HOURS			61	30	19

*4 Elective Credits required for 19-credit CCC
**30 Credit Biotech CCC (6160) is eligible for Title IV Financial Aid

Which degree or certificate is right for you?

A.S. Degree – You want to start a career. The A.S. degree prepares students for immediate employment as well as bachelor's degree transfer opportunities.

A.A./A.S. Dual Degrees – You want to transfer to a university for a bachelor's degree, start your career immediately, or both.

Biotechnology, CCC, 19 credits – You already have a bachelor's degree but want to acquire biotech lab skills to advance or change careers.

Biotechnology Laboratory Specialist, CCC, 30 credits – Ideal for A.A. students who want to add a biotechnology credential; many of the courses in this CCC double as A.A. electives.

palmbeachstate.edu/career-pathways/**Pathway-STEM**

Business Partners/Internships/Field Trips

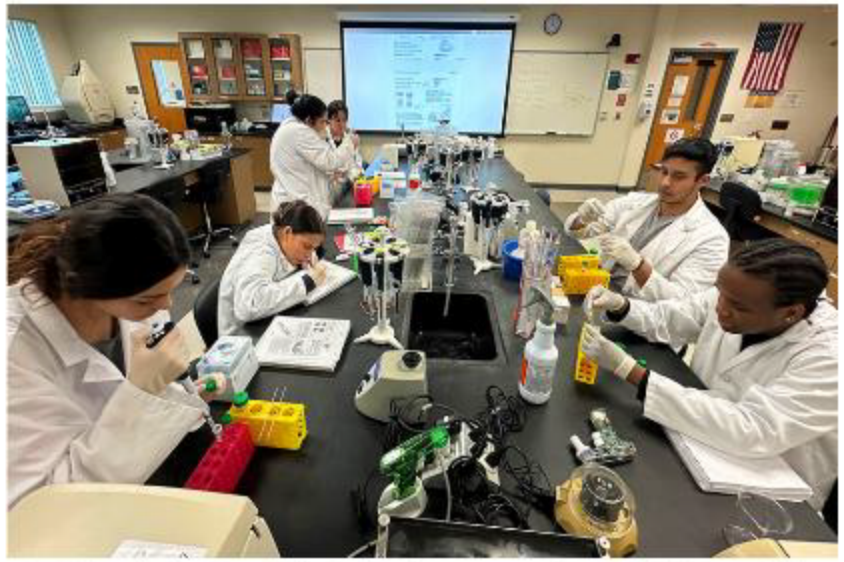
Alphazyme (BPC member) donates $50k to Biotech Program

Alphazyme awards Palm Beach State College $50K for biotechnology lab equipment

OCTOBER 4, 2023 | BY JOYCE EDELSTEIN

Alpha zyme
part of Maravai LifeSciences

Palm Beach State College's biotechnology students will gain access to the same laboratory equipment used in the industry thanks to a $50,000 donation from Alphazyme, an enzyme development and production company based in Jupiter. A subsidiary of Maravai LifeSciences, Alphazyme is a member of the College's Biotechnology Business Partnership Council and employs graduates of PBSC's Associate in Science degree and certificate programs in biotechnology.



In PBSC's biotechnology lab on the Palm Beach Gardens campus, students gain the high-demand skills needed in today's bioscience industry.

"Palm Beach State College was chosen to receive the Maravai LifeSciences Foundation gift due to its biotechnology program's dedication to advancing scientific education," said Chad Decker, Alphazyme's vice president and general manager. "We are proud that Alphazyme's first two employees were PBSC alumni, with an additional alumnus joining in 2022. As we continue to grow our company and the biotechnology industry in South Florida, it is very important to Alphazyme to maintain a close relationship with our local colleges and universities, and we look forward to our continued relationship with PBSC."

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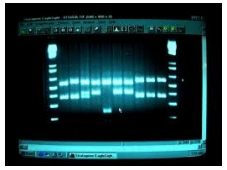
PBSC Biotech Program Courses

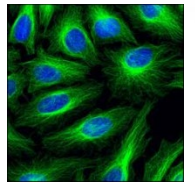
- Intro to Biotechnology
  - Lecture
  - Lab



- Biotech I Genomics
  - Lecture
  - Lab

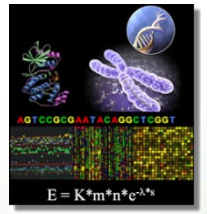
- Biotech II Proteomics
  - Lecture
  - Lab

- Intro to Tissue Culture
  - Combined Lecture & Lab



- Intro to Instrumentation
  - Combined Lecture & Lab

- Intro to Bioinformatics
  - Lecture



- Biotech Internship
  - 16 weeks
  - 320 hrs in-field

BEACH STATE COLLEGE

https://www.palmbeachstate.edu/career-pathways/pathway-stem/#as

Preparing Technicians for the Future of Work

A Framework for a Cross-Disciplinary STEM Core

Figure 1. Components of the Cross-Disciplinary STEM Core

DATA KNOWLEDGE AND ANALYSIS

Manipulating and interpreting data to resolve issues and using Excel and other common software proficiently to accomplish tasks

- Analytics tools
- Computational thinking
- Data analysis
- Data backup and restoration
- Databases
- Data fluency
- Data life cycle
- Data management
- Data modeling
- Data storage
- Data visualization
- Query languages
- Spreadsheets
- Statistics

ADVANCED DIGITAL LITERACY

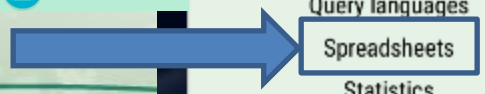
Understanding digital communications and networking, cybersecurity, machine learning, sensors, programming, and robotics at a higher than introductory level

- Artificial intelligence/ machine learning
- Automation/robotics
- Basic programming
- Cloud literacy
- Digital fluency
- Digital twins
- Edge computing
- Function block diagram programming
- Human-Machine Interface (HMI)
- Internet of Things (IoT)
- Network architecture
- Network communication
- Security controls

BUSINESS KNOWLEDGE AND PROCESSES

Understanding the value chain and business practices of an enterprise and applying principles of ethical adoption of new technologies

- Business cycles
- Blockchain
- Communication
- Continuous process improvement
- Customer/stakeholder analysis
- Entrepreneurship
- Ethics
- Lean processes
- Supply chains
- Market trends
- Overall Equipment Efficiency (OEE)
- Return on Investment (ROI)
- Risk management
- Supply and demand
- Vertical and horizontal integration



PALM BEACH STATE COLLEGE

Planning for Level 1 Cross-Disciplinary STEM Core Integration Instructional Card

PALM BEACH STATE COLLEGE

Spreadsheets in Biotechnology

Intro to Biotech Lab

Start of Semester

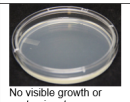
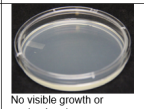
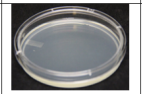
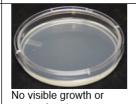
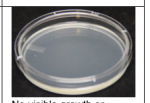
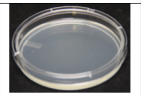
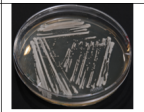
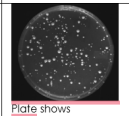
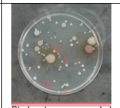
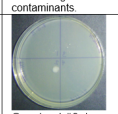
First Experiment Lab Report

Data& Observation Organization

Final Results Analysis

Sample Data Table:

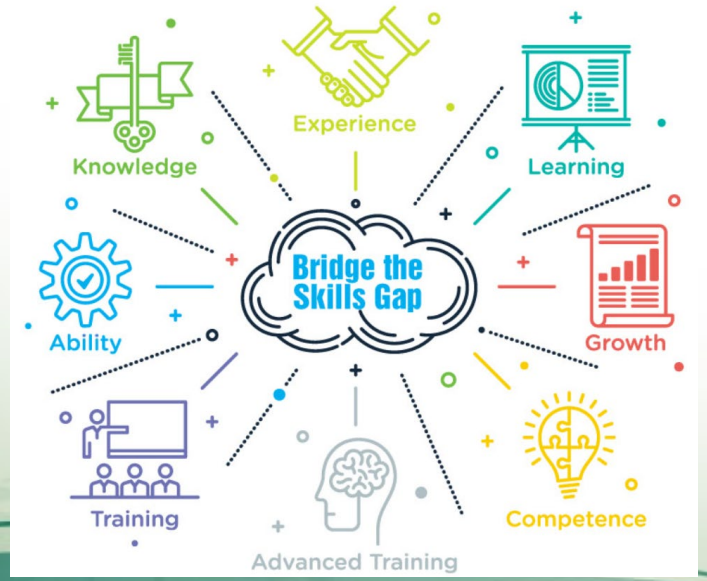
Data Table 1. Observations for Each LB Agar Plate Every 24 Hours

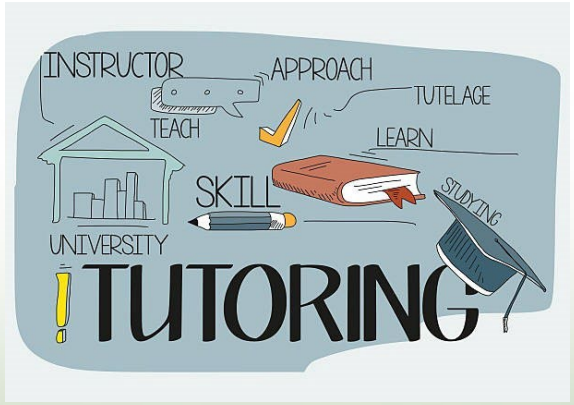
	Negative Control	Positive Control	Open 30min.	Open 3 hours	4-variables
Day 1	 No visible growth or contaminants.	 No visible growth or contaminants.	 No visible growth or contaminants.	 No visible growth or contaminants.	 No visible growth or contaminants.
Day 3 (72 hours)	 Plate shows no growth	 Plate shows bacterial growth along streaked pattern. Growth is off-white in color, uniform in colony size. Each colony is approximately 3mm in diameter.	 Plate shows approximately 100 small, dense, off-white colonies spread throughout plate.	 Plate shows a variety of growth. There are 3 large light-yellow colonies that are approximately 1 cm in diameter and significantly larger than the other colonies. There are x number of small colonies, approx.. 2-3mm in diameter.....	 Quadrant #3 shows one off-white colony that is approximately 6mm in diameter. This quadrant represents the men's room door handle leading into the men's room on the second floor of the SC building near the biotech labs.

PALM BEACH STATE COLLEGE

Challenges


2023 Fall Full Term (08/28/...
Home
Simple Syllabus
Syllabus
Announcements
Attendance
Modules
Assignments
Discussions
Grades
People
Library Resources
Badges
SLC - Tutoring Services
MyPBSC
Clutch Prep
Follett Discover
BigBlueButton
Quizzes
Collaborations
Helpful Info for lab reports (how to make Excel graphs/tables, etc.)
Helpful Info: Tutorials on how to use Excel to make tables, graphs, etc. As well as info on how to write an effective conclusion for your lab reports.
Lab_Safety
Info on Effective Lab Reports
Sample Lab Report Layout
ConstructingTables_Excel
ConstructingGraphs_Excel
Writing_Effective_Conclusions
LabManual_Glossary
Course_Success_Tools.zip
Sample Student Lab Reports (used with student permission)
Student Lab Report 3f sample good report2-Spring 2023.pdf
Student Lab Report 3f sample good report-Spring 2023.pdf
Resources?


Experience
Knowledge
Learning
Bridge the Skills Gap
Ability
Growth
Training
Competence
Advanced Training


INSTRUCTOR
APPROACH
TUTELAGE
TEACH
LEARN
SKILL
STUDYING
UNIVERSITY
TUTORING


Work Life
Diverse Experience
Training

How Do We Keep Curriculum Relevant?

PALM BEACH STATE COLLEGE

https://gsdi.unc.edu/our-work/workforce-development/

Thank you!

Alexandra Gorgevska, Ph.D.
Department Chair, Biotechnology Program
gorgevsa@palmbeachstate.edu
561-207-5003

PALM BEACH STATE COLLEGE

https://www.palmbeachstate.edu/career-pathways/pathway-stem/#as

At the Project Website:
Preparingtechnicians.org
Tools and Resources to Help You Take Action

- Read and share *A Framework for a Cross-Disciplinary STEM Core*
- Download, share and implement cross-disciplinary instructional cards in your class
- Listen to podcasts featuring cutting-edge industry interviews
- Share recorded webinars

Cross-Disciplinary Instructional Cards

Data Knowledge and Analysis

Manipulating and interpreting data to resolve issues and using Excel and other common software proficiently to accomplish tasks


DATA KNOWLEDGE AND ANALYSIS — For Students

Data Visualization

What Is Data Visualization?

Data visualization represents information in the form of a chart, diagram, picture, or infographic so that the data can be quickly and easily understood. Technicians use data visualization software to create graphics that communicate complex and relational information to a variety of audiences.

Vocabulary

- Dataset – a collection of data, often organized in a spreadsheet or database
- Chart – a graphic representations of data; examples are charts, pie charts, histograms, line graphs for example
- Scale – marks on a visualization that indicate the range of data values presented. A scale on a graph reflects the magnitude of the data presented.

Common Types of Data Visualization

- A pie chart uses "pie slices" to show relative sizes of data.
- A histogram uses bars of different heights to group data into ranges.
- A scatter plot uses points plotted on an XY axis to show the relationship between two sets of data.

How will a technician use data visualization?

Evan Garcia is a technician for Green Mountain Power Company. He is responsible for tracking increased system outages over time across a metropolitan network, collects outage statistics, including system logs, environmental information, and helpdesk ticket details from network nodes and service centers in order to determine the cause. Evan stores the data in an Excel workbook, then imports data into SAS, Tableau, or MS Power BI visualization tools and creates a dashboard to present to management. The data dashboard provides an interactive geographical heat map showing outage details and other graphical representations of his data analysis of the event. The heat map allows management to make real-time decisions and troubleshoot problems.

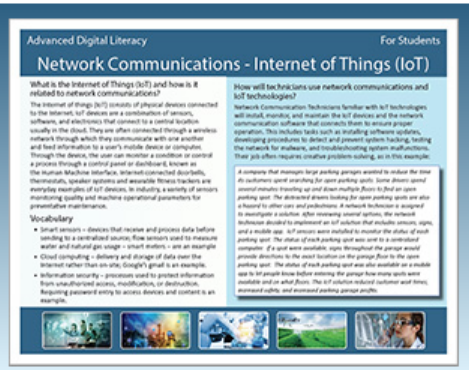
A heat map uses a warm to cool color spectrum to represent data values by color.

Instructional Activity Cards:

- Data Visualization
- Data Literacy/Fluency
- Spreadsheets
- Analytics Tools

Advanced Digital Literacy

Understanding digital communications and networking, cybersecurity, machine learning, sensors, programming, and robotics at a higher than introductory level


Advanced Digital Literacy — For Students

Network Communications - Internet of Things (IoT)

What is the Internet of Things (IoT) and how is it related to network communications?

The Internet of things (IoT) consists of physical devices connected to the Internet, IoT devices are a combination of sensors, software, and electronics that connect to a central location usually in the cloud. They are often connected through a wireless network through which they communicate with one another and feed information to a user's mobile device or computer. Through the device, the user can monitor a condition or control a process through a control panel or dashboard, known as the Human Machine Interface. Internet-connected doorbells, thermostats, speaker systems and wearable fitness trackers are everyday examples of IoT devices. In industry, a variety of sensors monitoring quality and machine operational parameters for preventative maintenance.

Vocabulary

- Smart sensors – devices that receive and process data before sending to a centralized source; flow sensors used to measure water and natural gas usage – smart meters – are an example
- Cloud computing – delivery and storage of data over the Internet rather than on-site; Google's gmail is an example.
- Information security – processes used to protect information from unauthorized access, modification, or destruction. Requiring password entry to access devices and content is an example.

How will technicians use network communications and IoT technologies?

Network Communication Technicians familiar with IoT technologies will install, monitor, and maintain the IoT devices and the network communication software that connects them to ensure proper operation. This includes tasks such as installing software updates, developing procedures to detect and prevent system hacking, testing the network for malware, and troubleshooting system malfunctions. Their job often requires creative problem-solving, as in this example:

A company that manages large parking garages wanted to reduce the time its customers spent searching for open parking spots. Some drivers spend several minutes traveling up and down multiple floors to find an open parking spot. The distracted drivers looking for open parking spots are also a hazard to other cars and pedestrians. A network technician is assigned to investigate a solution. After reviewing several options, the network technician decided to implement an IoT solution that includes sensors, signs, and a mobile app. IoT sensors were installed to monitor the status of each parking spot. The status of each parking spot was sent to a centralized computer. If a spot were available, signs throughout the garage would provide directions to the most location on the garage floor to the open parking spot. The status of each parking spot was also available on a mobile app so lot people know before entering the garage how many spots were available and on what floors. The IoT solution reduced customer wait times, increased safety, and increased parking garage profits.

Instructional Activity Cards:

- Network Communications – Internet of Things
- Automation/Robotics/HMI
- Basic Programming-Python
- Digital Twins
- Network Architecture

Business Knowledge and Processes

Understanding the value chain and business practices of an enterprise and applying principles of ethical adoption of new technologies


Business Knowledge & Processes — Student Resource

ENTREPRENEURSHIP

What Is Entrepreneurship?

Entrepreneurship is the concept of developing and overseeing a new business for profit. Working inside a company and thinking like an entrepreneur by asking "how can we improve this process?" is just as important. Entrepreneurship means thinking beyond troubleshooting or problem solving. It involves taking extra effort that yields potential new products, services or processes.

Vocabulary

- Entrepreneur—An individual who starts a new business venture. Typically, the individual who takes on most of the risk and develops the business concept.
- Venture—A business enterprise in which the expectation of gain is accompanied by the risk of loss or failure.
- Capital—The wealth or assets available to invest in a business.
- Business Model—A description of how a business will be able to create and deliver value and become profitable.
- Market Research—Relevant data that helps demonstrate market potential for a business venture.
- Intellectual Property—Works or inventions that is the result of creativity to which one has rights and can apply for a patent, copyright, or trademark.

How will an entrepreneurial mindset be used in the workplace?

An Industry 4.0 technician of tomorrow needs creative entrepreneurial thinking as a new, expected skill. John Gruene is an automotive technician at Advanced Auto. Lately John and his team have experienced several customer complaints regarding repair times. Using an entrepreneurial mindset, John identified the problem and then researched possible solutions and their value propositions. He asked questions like: how much is customer satisfaction and loyalty worth? and how much time and money can be saved through more accurate diagnosis and efficient repair? He then approached his supervisor about a potential solution he has researched that will provide better customer service, shorter wait times, and fewer errors by the technicians, resulting in higher profits for the business.

In another example, Casey Sanders is a robotics technician at Cooper Biologic, an automated filling and packaging company. Over the last seven days, a robot gripper has been dropping every hundredth vial. The fault affected everything down the line, to the point at which several boxes shipped to a customer were short a few vials. This is clearly not an acceptable business practice. Casey applied troubleshooting skills to

Instructional Activity Cards:

- Entrepreneurship
- Communication
- Lean Processes
- Supply and Demand

Podcasts

Episode 38: Technicians in the New Blue Economy
Podcast Guest: Justin Manley, President of Just Innovation, Inc. April 2022 |

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Podcast Guests: Kristine Christensen, Director of Faculty Development, Professor of MIS, Moraine

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Podcast Guest: Phil Gilkes, Regional Maintenance Manager, Dollar Tree Distribution Centers February 2022

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Podcast Interviews Provide Direction

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iv. **Podcasts: New Skills, New Generations of Students**

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i. **Podcasts: Automation, Robotics, and Advanced Manufacturing**

AUTOMATION, ROBOTICS, AND ADVANCED MANUFACTURING		
Topic and Episode(s)	**Discovery**	**Recommended Action**
1. A Robot for Every Technician? PC13 and PC22	A robot for every technician is an emerging trend in the workplace.	Ask yourself if it is possible for you to consider something similar in your education and training space? A robot (or an automated system) for every student, in every learning situation?

Recordings of This Webinar Series

1. Preparing Technicians Using the Cross-Disciplinary STEM Core
2. Professional Development and Instructional Resources
3. Future of Work: Integrating Emerging Technologies

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