TECHNOLOGY & INNOVATION COLLABORATIVE

NJ PATHWAYS
TO CAREER OPPORTUNITIES
Aligning Education to Build an Innovative Workforce

WELCOME

Dr. Anthony J. Iacono

President (County College of Morris)

NJ PATHWAYS
TO CAREER OPPORTUNITIES
Aligning Education to Build an Innovative Workforce

OPENING REMARKS

Dr. Aaron Fichtner

President
(NJCCC)

Kyle Sullender

Director of
Economic Policy
Research (NJBIA)

HOSTED BY

Veda Shamsid-Deen, Esq.

Director, Technology and Innovation Sectors Strategy and Workforce Partnerships (NJCCC)

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AGENDA

- Data Science Pathway at County College of Morris
- Data Science Pathway at Camden County College
- NJBDA & NJ Pathways
- Pathways for the Center of Workforce Innovation for Data Science
- Industry Panel Discussion

DATA SCIENCE PATHWAY

County College of Morris

Kelly Fitzpatrick

Mathematics Professor

County College of Morris
Data Science Pathway
NJCCC Center of Workforce Innovation

November 16th 2022

Kelly Fitzpatrick
kfitzpatrick@ccm.edu

NJ PATHWAYS
TO CAREER OPPORTUNITIES

COUNTY COLLEGE OF MORRIS

CCM Highlights

WORKFORCE Development
Created two certificates for working professionals:
Data Visualization and
Data Analytics

These **INITIATIVES** are supported by an NSF Grant #2000887

16 Credit Data Analytics Certificate

Students **LEARN** R, Python, SQL and Tableau

ASA Datafest **WINNERS**

CCM is the Administrative Community College Partner of the Center

The certificate in Data Analytics will prepare individuals to apply data science techniques to:

- generate insights from data
- identify and predict trends utilizing multiple variables
- work with real world datasets to answer and solve societal problems
- explore ethical issues related to data privacy, security and integrity

MAT 114
Intro to Data Science (3cr)
New

MAT 130
Probability and Statistics I (4cr)
Revised

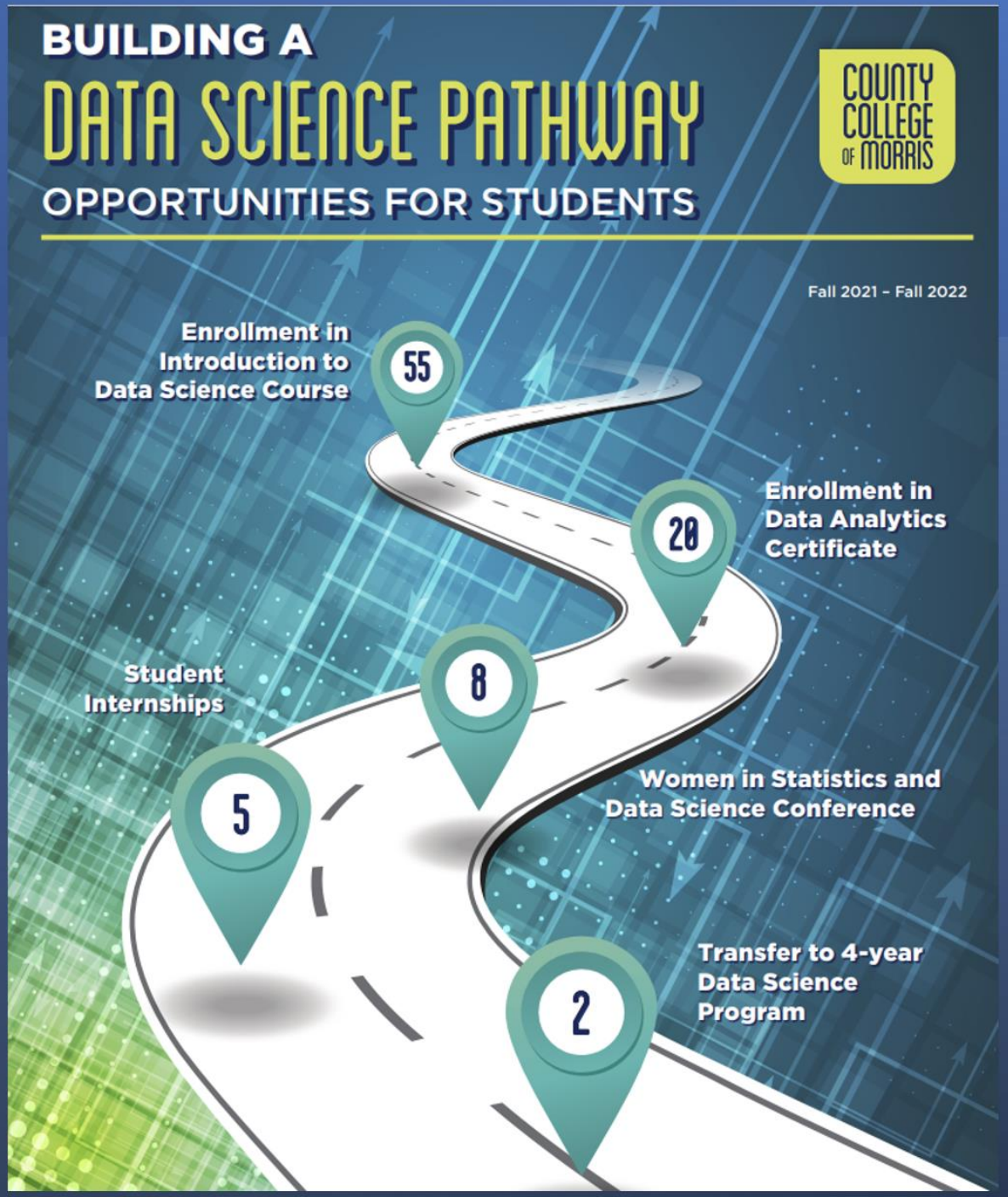
CMP 131
Fundamentals of Programming (3cr)
New

GOAL

To Support Establishment of a College Credit Certificate in Data Analytics

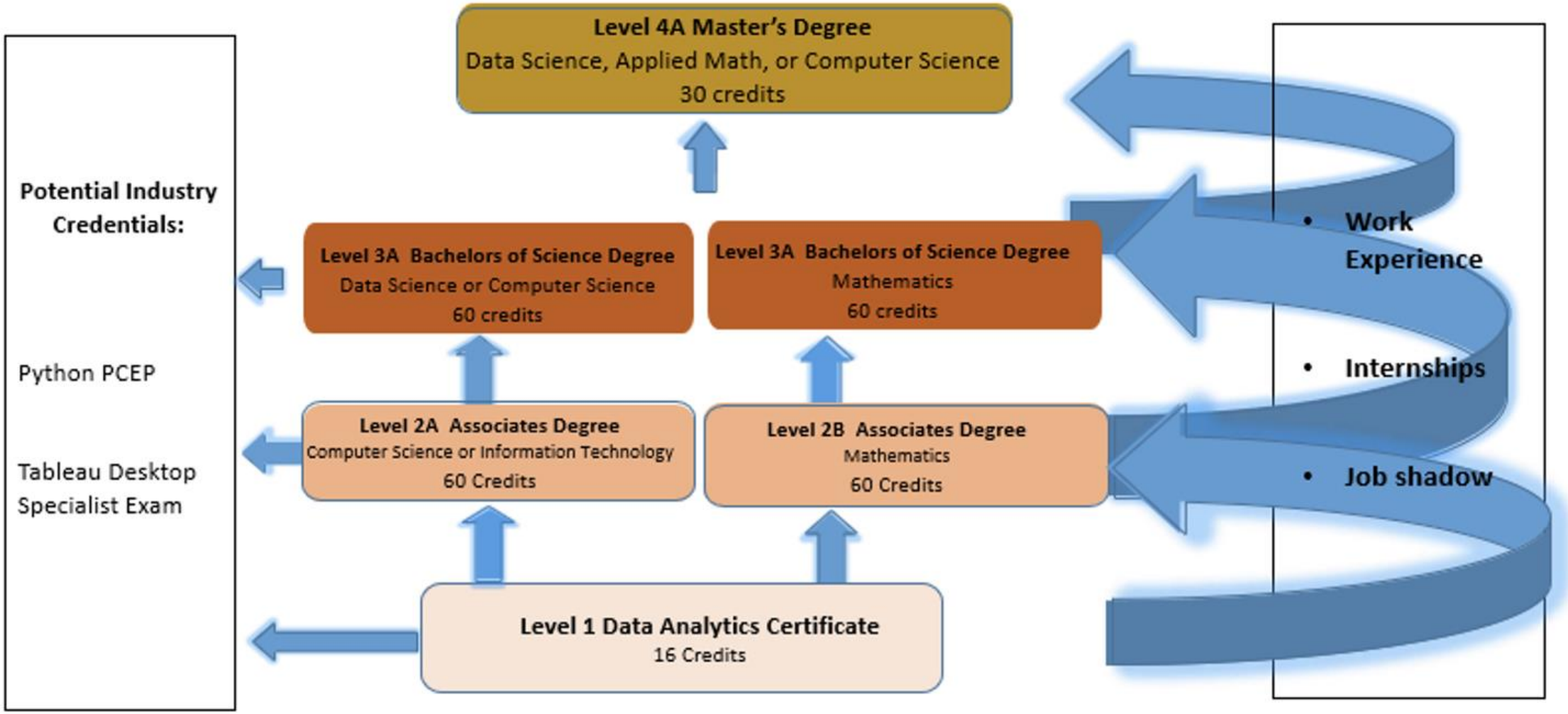
CMP 241
Database Programming (3cr)

CMP 262
Data Science Programming (3 cr) OR
ENR 264 Machine Learning
New


BUILDING A
DATA SCIENCE PATHWAY
OPPORTUNITIES FOR STUDENTS
COUNTY COLLEGE OF MORRIS
Fall 2021 - Fall 2022
Enrollment in Introduction to Data Science Course
55
Enrollment in Data Analytics Certificate
20
Student Internships
8
5
Women in Statistics and Data Science Conference
Transfer to 4-year Data Science Program
2

NJ Stackable Credentials Model for Data Science (Data Practitioner, EDC) 2+2+1

Reference: http://oceansofdata.org/our-work/big-data-stackable-credentials-report



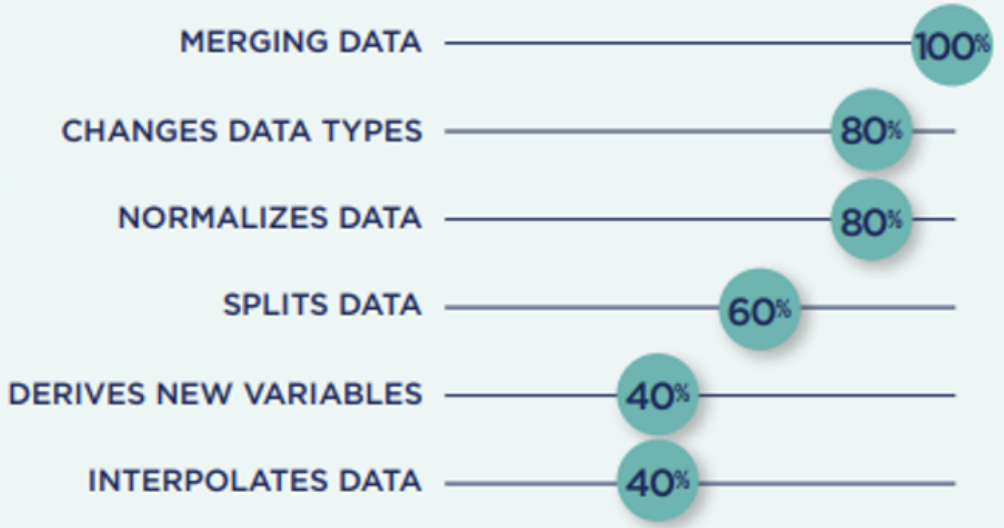
ADVISORY BOARD

The advisory board met in the Spring 2021 semester. The discussion focused on the top six skills students' need to learn relating to transforming the data.

Intel is the newest member to join our board.

Resource for Advisory Board Meetings:
Malyn-Smith, J., & Ippolito, J. (2018). Tools for building a big data career pathway (NSF-ATE DUE 1501927). Oceans of Data Institute, Education Development Center. Retrieved from http://oceansofdata.org/our-work/tools-building-big-data-career-path

TOP 6 SKILLS FOR TRANSFORMING DATA



Atlantic Health System

Wider Circle®

ADP®

Ramapo College of New Jersey

BAYER

The Data School

Data Analysis is for EVERYONE

Bringing everybody to the table

DIVERSITY

Increase underrepresented populations by using:

- real world examples
- collaboration
- group projects

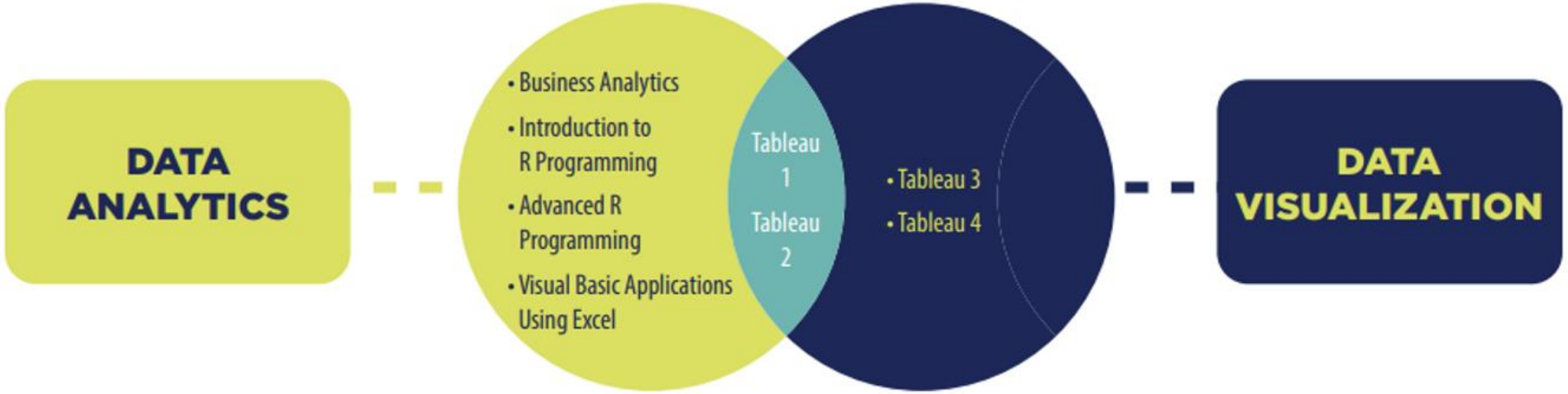
EQUITY

- **Meet students at their academic level**
- **Using OER /Free resources**

INCLUSION

- Low barriers to entry
- Low math prerequisites
- Using Point and Click software
- Computational Thinking

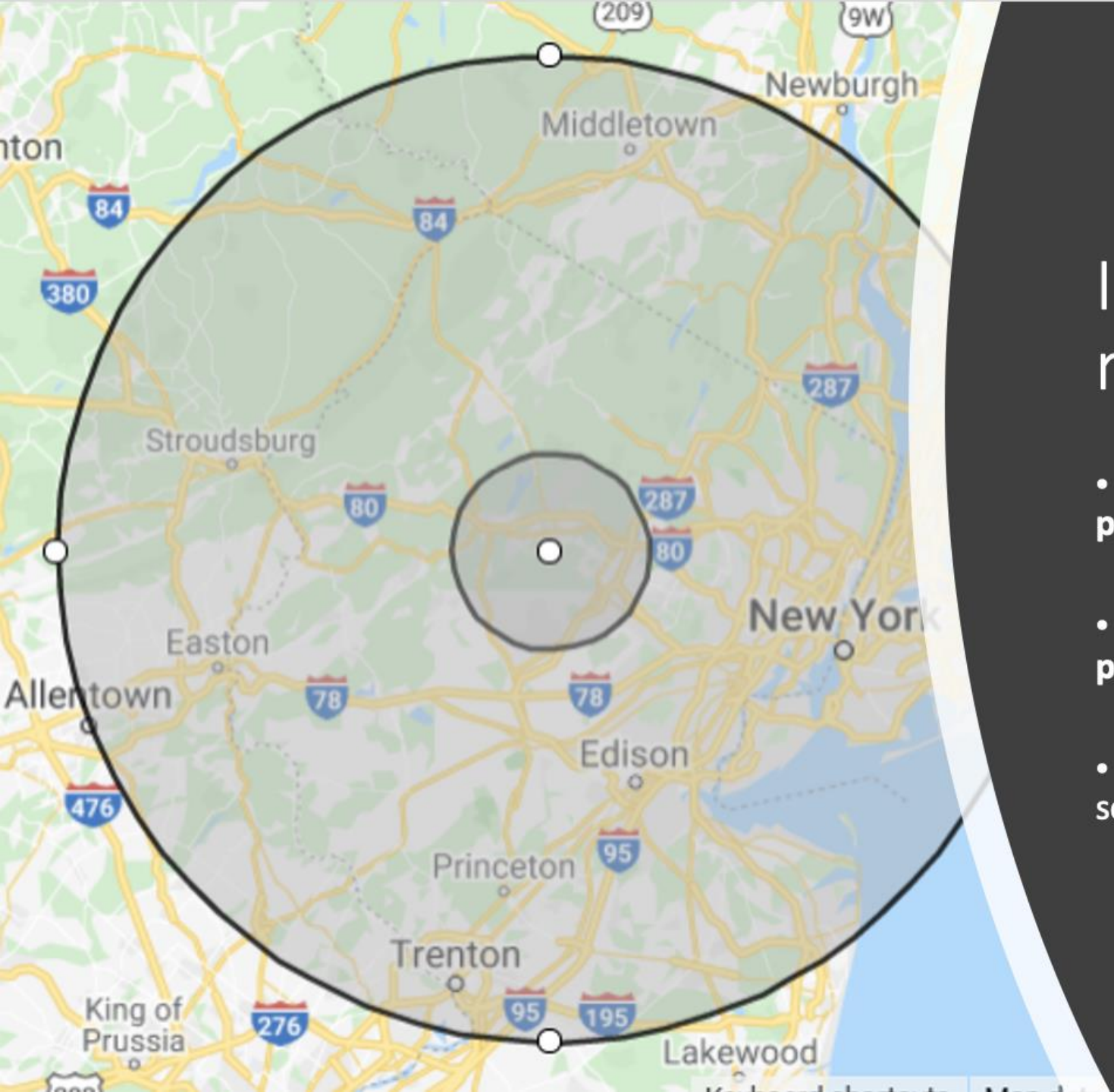
DIFFERENTIATE YOURSELF & GET RECOGNIZED



Take all 6 courses to receive a Data Analytics Certificate

Take all 4 courses to receive a Data Visualization Certificate and prepare yourself for the Tableau Specialist Desktop Exam

CENTER FOR WORKFORCE DEVELOPMENT



Indeed search for jobs requiring Tableau skills

- A 25-mile radius of the college, returns **421 postings**
- A 50-mile radius of the college, returns **4,172 postings**
- A 100- mile radius of the college, the same search returns **5,397**

https://tinyurl.com/CCMDataSciencePathways

Data Science Pathways by Kelly Fitzpatrick

COUNTY COLLEGE OF MORRIS

Choose a Pathway
- [x] (All)
- [x] Internships
- [x] Jobs
- [x] Transfer

Data Science Pathways

The County College of Morris has created several different pathways for our students.
Hover over an icon to select your **future**: internships, jobs and transfer opportunities.
Click an icon, and it will bring you to the webpage to learn more about this opportunity.
If you have questions please contact Professor Fitzpatrick at kfitzpatrick@ccm.edu.

BASF | Booz Allen (Remote) | Deloitte | Honeywell | National Security Agency (NSA) | Ramapo | San Jose State (Remote) | The Data School | White House

Thank you for spending the day at CCM.

COUNTY COLLEGE OF MORRIS

ALUMNI SPEAKER

Thomas Ortega

Co-Op, UPS TEC Analytics Team (UPS)

County College of Morris Alumni

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ALUMNI SPEAKER

Joseph Gatto

PhD Student, Machine Learning (Dartmouth)

County College of Morris Alumni

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DATA SCIENCE PATHWAY

Camden County College

Anita Wright

Asst. Professor of Computer Science

CAMDEN COUNTY COLLEGE

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Camden County College
Data Science (DSC.AAS)

Program Overview

- The Data Science AAS degree timeline
  - Received state approval 10/2020
  - Pilot classes were offered in 2021
  - CCC joined the NJ Pathways to Career Opportunities Center of Workforce Innovation for Data Science in 2022
  - Fall 2022 we have 5 matriculating majors with several other students sampling the gateway Ethics course

- The program prepares students for careers in Data Science or Data Analytics

- The AAS degree choice provided the opportunity to incorporate lab-based data science courses that focus on the practice of data science activities

Program Outcomes

- Exhibit **professionalism** and adopt ethical decision-making principles for the analysis, management and presentation of data with an understanding of one's responsibilities within a professional setting.

- Develop solid **analytical reasoning, critical thinking and technical skills** in order to extract, wrangle, analyze and present data for multiple disciplines to broad audiences that follow professional standards to enhance understanding and decision-making.

- Demonstrate the ability to **work independently and as a member of a team** with modern technology tools to accomplish data life cycle project goals and meet deadlines.

- **Communicate technical knowledge** effectively for a broad range of persons that include customers, managers, and peers.

Progression of Course Work

Year 1

First Semester

Ethical Use of Data
Intro and Overview of the Data Lifecyle, Data Formats, and Tools
Statistical Methods and Research Techniques
Mathematics Foundation
Written Communication

Second Semester

Data Preparation and Munging
Python Programming
Hypothesis Testing and Forecasting
Mathematics Foundation
Written Communication

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WE ARE WHAT'S NEXT

CAMDEN COUNTY COLLEGE

Progression of Course Work

Year 2

Third Semester

Data Analysis
Data Science Applications Programming (Python)
Mathematical Modeling
Macro Economics (Social Science)
Humanities Elective

Fourth Semester

Data Visualization and Presentation
R Statistical and Machine Learning
Probabilistic Modeling
Capstone Seminar

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WE ARE WHAT'S NEXT

CAMDEN COUNTY COLLEGE

CAMDEN COUNTY COLLEGE

Current NJ Pathways Initiatives

NJ PATHWAYS
TO CAREER OPPORTUNITIES
Aligning Education to Build an Innovative Workforce

- Certificate Program
- Advisory Board
- Professional development
- PLA/Industry Certifications
- Dual Credit
- Student Transfer Options

CAMDEN COUNTY COLLEGE

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Aligning Education to Build an Innovative Workforce

Thank you!

NJBDA & NJ PATHWAYS

New Jersey Big Data Alliance

George Avirappattu, Ph.D.

Associate Professor of Mathematics
(Kean University)

NJBigData Alliance

NJBDA and NJ Pathways

Dr. George Avirappattu
VP for Education and Training, NJBDA

Associate Professor of Mathematics, Kean University
gavirapp@kean.edu

NJ Big Data Alliance

New Jersey Big Data Alliance

The **New Jersey Big Data Alliance (NJBDA)** is a consortium of 18 New Jersey colleges and universities, along withindustry and government partners, with the goal to leverage New Jersey's academic expertise in Big Data analytics,cybersecurity, artificial intelligence, and advanced computing technologies to **promote data-driven economic development across the state.**

In 2014, the state enacted P.L. 2014, c.33 (N.J.S.A. 53:17C-3.4) that designated the NJBDA as New Jersey's "**Advanced Cyberinfrastructure Consortium**" along with a starter mission.

Currently, the NJBDA is an **all-volunteer organization** that focuses our efforts primarily on research, networking and workforce development activities. Accomplishments include:

- ✓ Secured a US Economic Development Authority grant - ***"Building the Capacity of New Jersey Businesses and Workers to Adjust to and Successfully Compete in the Digital Age"*** to provide education and trainingfor students and businesses to spur the adoption of data analytics to grow the state's data driven economy.
- ✓ Wrote report for the Governor's Task Force on the Future of Work: ***"New Jersey Big Data WorkforceRoadmap: An Examination of the Challenges and Opportunities for New Jersey's Workforce to Successfully Compete in the Data-Driven Economy".***
- ✓ Hosting an ***Annual "Big Data" Symposium*** every year since 2013. This event includes a student job fair, world-renowned keynote speakers, academic panels and industry workshops.
- ✓ Organized a ***Big Data Career Workforce Forum***, with New Jersey employers discussing hiring needs for advanced computing positions, resources to fill the talent pipeline, and connecting students to employers.

NJ Big Data Alliance

New Jersey Big Data Alliance

Future Projects

The NJBDA recently received state line-item funding to hire an executive director, who will be based at NJIT. With this staff support the NJBDA plan to expand into some additional areas. Potential projects include:

- Partner with the **NJ Pathways** initiative to improve connections for students and faculty in Data Science across all the 2 year and 4-year higher education institutions in New Jersey.
- Expand **industry partnerships and memberships of companies** to enable access to NJBDA expertise and opportunities for economic growth.
- **Provide an assessment the State's cyberinfrastructure** and the expertise necessary to operate it.
- **Identify strategies** to catalyze advanced cyberinfrastructure to drive economic development.
- Develop **"Big Data" curriculum materials** which can be offered at New Jersey colleges, universities, community colleges and even high school and middle schools as part of STEM educational initiatives.
- Become a **one-stop shop for the state's research and development community** to engage our leading-edge academic community in big data research and project support.

NJ Big Data Alliance

NJBDA Members & Partners – 18 University Members and growing

The proud member institutions of the New Jersey Big Data Alliance are…

Edge
Felician University
Kean
Monmouth University
Montclair State University
NJCU
NJIT New Jersey Institute of Technology
Princeton University
Ramapo College of New Jersey
Rider University
Rowan University
Rutgers The State University of New Jersey
Saint Peter's University
Seton Hall University
Stevens Institute of Technology
Stockton University
TCNJ The College of New Jersey
Thomas Edison State University
William Paterson University

The proud corporate members of the New Jersey Big Data Alliance are…

CGI
NEC NEC Laboratories America
pka tech IT solutions
RICOH imagine. change.

The proud partners of the New Jersey Big Data Alliance are…

choose: new jersey
Middlesex County, NJ
NJBAC New Jersey Business Action Center
New Jersey CSIT Commission on Science, Innovation and Technology
DOL
NJ EDA

NJ Big Data Alliance

Potential Avenues for NJBDA Engagement

- Organize a seminar(s) for all member institutions for NJ PATHWAYS
  - Introduce the NJ Pathways
  - Explore articulation agreements
- Arrange NJBDA visit to Pathways Centers
- Offer workshops for County College/High School faculty
- Help develop data science curriculum

NJBigData Alliance

Potential Avenues for NJBDA Engagement –
continued…

- Identify industry valued courses and programs across colleges
- Help create industry valued courses aligned with credentials
- Help attract industry partners with data science needs
- Help develop experiential learning and internship opportunities
- Get on new NJBDA director's agenda

NJBigData Alliance

NJBDA Executive Committee

- **President** - Matt Hale, Seton Hall
- **Secretary** - Chanelle Lester, TCNJ
- **Treasurer** - Candace Fleming, Montclair
- **VP Academic Membership** – Adam Scarzafava, EDGE
- **VP Affiliate Membership** – Rashmi Jain, Montclair
- **VP Education and Training** – George Avirappattu, Kean
- **VP Entrepreneurship** – Dave Belanger, Stevens
- **VP Research Collaboration** – Forough Ghahramani, EDGE
- **VP Advanced Technology** – Demetrios Roubos, Stockton
- **VP Government Relations** – Peggy Brennan-Tonetta, Rutgers
- **VP Marketing and Outreach** – Wright Seneres, Princeton

NJ Big Data Alliance

Q&A

CENTER OF WORKFORCE INNOVATION FOR

Data Science

Veda Shamsid-Deen, Esq.
Director, Director for Technology & Innovation Sectors Strategy and Workforce Partnerships (NJCCC)

NJ PATHWAYS
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PATHWAYS:

Data Science

PATHWAY:
Data Science

Connection to High School (Dual Enrollment)

Develop two Data Science programs for all High Schools.

NJ PATHWAYS
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PATHWAY:
Data Science

Prior Learning Assessment (Credit)

Evaluate non credit credentials (Python entry level and Python Programming courses) to embed in Data Science AS or AAS at Camden County College, Middlesex College, County College of Morris, and Brookdale Community College (under development).

PATHWAY:
Data Science

Connection to 4-Year University

Create model 2+2 articulation agreement with Ramapo University.

PATHWAY:
Data Science

Experiential Learning

Develop experiential learning program to be embedded into Data Science AS or AAS at Camden County College, Middlesex College, County College of Morris, and Brookdale Community College (under development).

PATHWAY:
Data Science

Adult Learners (Non Credit)

Develop non credit workforce program embedding industry credentials (Python Programming, R, and Tableau).

PATHWAY:
Data Science

Professional Development

Create train-the-trainer resources, share it widely with other education institutions statewide, and deliver professional development on the Data Science Pathway.

GIVE US YOUR FEEDBACK

DATA SCIENCE Industry Panel

Aaron Price

President & CEO
(TechUnited)

Margo Connors

Senior Program
Manager (Microsoft)

Gary Mann

CEO
(Jasfel Analytics)

THANK YOU

#NJPATHWAYS

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@NJ Community Colleges

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NJPathways.org

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