ANNE ARUNDEL COMMUNITY COLLEGE
101 College Parkway | Arnold, Maryland 21012-1895 | 410-777-AACC (2222) | www.aacc.edu

Dr. Dawn Lindsay
President
410-777-1177
Fax: 410-777-4222
dslindsay@aacc.edu

March 2, 2018

Dr. James D. Fielder Jr.
Secretary of Higher Education
Maryland Higher Education Commission
6 N. Liberty Street
Baltimore, MD 21201

Dear Dr. Fielder:

Anne Arundel Community College proposes a new program, the Data Literacy certificate (a lower division certificate). The Data Literacy program can be implemented with adequate equipment, facilities and library resources to meet the programs' needs. The proposed program allows for students to earn an academic certificate in data literacy while developing introductory skills in data analysis that can be applied to a wide range of career opportunities.

Data Literacy Certificate	$850.00
Total	$850.00

I look forward to your positive response. Should you have any questions, please contact Dr. Alycia Marshall, Associate Vice President for Learning & Academic Affairs at aamarshall@aacc.edu or (410) 777-2776.

Sincerely,

Dr. Dawn Lindsay
President

cc: Michael Gavin, Ph.D., Vice President for Learning
Alycia Marshall, Ph.D., Associate Vice President for Learning & Academic Affairs
Nanci Beier, M.A., Registrar
Karen Cook, J.D., Dean, School of Business & Law
Dr. Gretchen Mester, Chair, Economics

MARYLAND HIGHER EDUCATION COMMMISSION
ACADEMIC PROGRAM PROPOSAL

PROPOSAL FOR:

X NEW INSTRUCTIONAL PROGRAM

____ SUBSTANTIAL EXPANSION/MAJOR MODIFICATION

____ COOPERATIVE DEGREE PROGRAM

X WITHIN EXISTING RESOURCES or ____ REQUIRING NEW RESOURCES

(For each proposed program, attach a separate cover page. For example, two cover pages would accompany a proposal for a degree program and a certificate program.)

Anne Arundel Community College
Institution Submitting Proposal

Fall 2018
Projected Implementation Date

Certificate
Award to be Offered

Data Literacy
Title of Proposed Program

Suggested HEGIS Code

Suggested CIP Code

Economics
Department of Proposed Program

Dr. Gretchen Mester
Name of Department Head

Dr. Gretchen Mester
Contact Name

gmester@aacc.edu
Contact E-Mail Address

410-777-2326
Contact Phone Number

Signature and Date
President/Chief Executive Approval

February 15, 2018
Date
Date Endorsed/Approved by Governing Board

A. Centrality to institutional mission statement and planning priorities:

1. Provide a description of the program, including each area of concentration (if applicable), and how it relates to the institution's approved mission.

AACC's Mission Statement: "With learning as its central mission, Anne Arundel Community College responds to the needs of our diverse community by offering high quality, affordable, accessible, and innovative life-long learning opportunities."

The proposed certificate, "Data Literacy," provides functional skills and literacies in simple data analysis within a common statistical package. It introduces advanced techniques to analyze data and prepares students to read and interpret results using these techniques. There is a strong emphasis on the work before and after analysis, such as proposing questions, collecting data, interpreting results and applying findings to improve decision-making. Supervisory and managerial positions require knowledge of data collection and data reliability, and an ability to interpret and apply results to improve decision-making. This subset of decision science skills offers opportunities for new employment as well as powerful opportunities for advancement. For the purposes of this application, AACC defines those jobs as those that require analytic skills, but are not at the level of data scientists as 'analytic enabled jobs.' One intended audience for this certificate will be those individuals who have completed a bachelor's degree and are seeking to enhance and update their data literacy skills. These skills may be within their current job position or they may be able to seek other job opportunities.

Data literacy is defined as "the ability to understand and use data effectively to inform decisions.[1]" In the information age, data literacy is necessary to be effective in *any* position with decision making responsibilities. Statisticians and analysts provide the information, but it is the managers and supervisors who are tasked with applying results and seeing the big picture. There is a skills gap as a result of the changing industries where analysis and evaluation is the norm. Where general managerial jobs did not necessarily require these skills to be sharp and honed, now there is a lack of qualified incumbents and applicants who couple data literacy and soft skills related to data literacy training, such as quantitative problem solving and information synthesis.

This certificate program follows Anne Arundel Community College's mission to offer "high quality, affordable, accessible and innovative lifelong learning opportunities" by seeking to narrow or eradicate that skills gap for employers hiring in Anne Arundel County while providing a training mechanism for employers to promote from within after employees achieve the skills associated with the certificate. Learning outcomes and course options have been carefully chosen to assure value, and the options for course formats and credit for prior coursework offers the accessibility that the targeted students may require. This program also provides necessary data literacy skills for a variety of positions to support employment and advancement in our surrounding community.

Various sources of job market data list data literacy or data analysis skills as important for many professions. Few, though, describe exactly what is meant by "data analysis skills" in a way that can be translated into learning outcomes. One source describes the Data Science and Analysis

[1] "A Systematic View of Implementing Data Literacy in Educator Preparation." Ellen B. Mandinach and Edith S. Gummer, Sage Journals, January 1, 2013.

(DSA) skill levels need for "analytics-enabled jobs" and "data-driven decision makers" (as opposed to jobs as an analyst or data scientist).[2] This source was consulted to identify the learning outcomes for this program.

2. **Explain how the proposed program supports the institution's strategic goals and provide evidence that affirms it is an institutional priority.**

The college's strategic plan, Engagement Matters: Pathways to Completion, focuses on creating the ideal conditions to ensure that more students complete their educational goals and earn family sustaining wages. The college is pursuing this plan while adhering to the mission's central tenet of committing to academic excellence. That is the fundamental foundation upon which the work and continued reputation as a college of distinction is built.

The college's strategic plan is strongly rooted in national research and best practices and reflects the student's journey through the key milestones of engagement, entry, progress and completion. This guided pathways approach aims to provide better structure through intentional programming and interventions that will help all students through each milestone. The overriding purpose of Engagement Matters: Pathways to Completion is to "increase completion by transforming the culture of the institution to ensure equity and that the college remains student-ready and committed to academic excellence". The three Engagement Matters goals are:

- **Goal 1: Engagement & Entry** - Increase connection and enrollment of all students through a college-wide emphasis on equity, student success and academic excellence.
- **Goal 2: Progress** - Increase progress of all students through a college-wide emphasis on equity, student success and academic excellence.
- **Goal 3: Completion** - Increase completion of all students through a college-wide emphasis on equity, student success and academic excellence.

Enrollment is always a concern. Connecting and cooperating with the local business community supports enrollment efforts and supports our Strategic Plan's Goal 2 (Engagement & Entry). The college's economics department consistently engages with our surrounding business community to impact the future potential enrollment of the proposed program. This outreach and connection with the business community will support increased enrollment.

AACC's strategic plan integrates student success within the steps of programs with the objectives of Engagement & Entry, Progress, and Completion. This Data Literacy program will align with these objectives. Engagement & Entry is met through cooperation with employers that supports informed instructors who can advise students immediately. Online access supports working students and their job demands. Progress is monitored through ongoing assessments and immediate feedback to the student. Completion is supported through effective instructional strategies and real world applications.

B. Critical and compelling regional or Statewide need as identified in the State Plan:

[2] "Investing in America's Data Science and Analytics Talent: The Case for Action." Price Waterhouse Cooper, April 2017. Accessed Nov 29, 2017 at: https://www.pwc.com/us/dsa-skills.

1. **Demonstrate demand and need for the program in terms of meeting present and future needs of the region and the State in general based on one or more of the following:**
   - **The need for the advancement and evolution of knowledge;**
     There is a great need within our community for the advancement and evolution of knowledge. As identified by the state plan "The completion of workforce training programs, credentials, and certificates holds tremendous value for those who complete them." Individuals are working in an increasingly complex environment with ever changing technology. In order to keep up and remain competitive, they must continue to advance and evolve their knowledge. One way to do this is to add to their current skill set in order to adapt to the changing environment and changing demands. Students who earn this certificate will be able to add value to their company and their career with the additional skills of data literacy.

2. **Provide evidence that the perceived need is consistent with the Maryland State Plan for Postsecondary Education (pdf).**
   Quality and Effectiveness: Consistent with the Maryland State Plan, Anne Arundel Community College continues to offer quality programs that are instructed by top notch and innovative professors. Our instructors, courses, and programs are regularly assessed to ensure we are on the right track. Feedback from the assessments is used to improve program and course outcomes along with improved instruction. For example, the economics department is creating model courses for our two most highly enrolled courses to support and increase student success. These courses create a shell for all full-time and part-time instructors to use. Each model course houses a sample syllabus, sample assessments, chapter summaries and outlines, to further ensure that all instructors maintain quality and effectiveness of instruction and delivery of course content. The proposed Data Literacy program is considered to be of high quality and aligns with the Maryland State Plan's goal of Quality and Effectiveness. The development of two new required courses for the certificate program, "Data, Sampling, and Analytics" and "Data and Analytics Project Seminar," will support the quality and effectiveness of this certificate.

   Innovation: Currently, all classes at AACC require the use of Canvas, our Learning Management System, for every class to store grades and make resources more accessible to students. Many professors implement Canvas in more extensive ways to supplement their face-to-face courses. Also, we offer many of our courses online such as Business Statistics and Principles of Economics 1 and 2. Business Statistics is one of the required courses that is part of the proposed certificate. Research-based instructional strategies and assessments (formative and summative) are implemented in every course to support student success. For example, in the Business Statistics course, students work with data provided by local businesses via Service Learning. The students' responsibility is to work with the local business partner to determine relevant questions to be addressed. They then collect, analyze, interpret the data and draw conclusions. This supports the transfer of theory in the classroom to real-world applications in the work place.

   Affordability: Anne Arundel Community College remains an affordable option for students in the surrounding area. We offer courses at various times of the day, various locations, and various formats thus increasing the accessibility of our courses and programs. As we work towards the goals of our strategic plan, we are striving to increase engagement and entry while guiding students towards progress and completion. The proposed certificate is an affordable option for students, increases access to employable skills in data literacy, and is aligned with the Maryland State Plan's Goal 2 (Access, Affordability and Completion). Based on the "Job Postings

Analytics[3]" there are many positions that would benefit from the skills that will be provided within the program. For example, the position of manager in a variety of fields, such as restaurant or food industry, nursing, office, warehouse, and branches, would benefit from data literacy skills. The position of manager is listed as one of the top posted occupations in the Anne Arundel County area. Such a certificate would support the Maryland State's Plan Goal 5 (Economic Growth and Vitality).

C. Quantifiable & reliable evidence and documentation of market supply & demand in the region and State:

The intent of this certificate is to bridge the skills gap already noted and add valuable skills and knowledge for those in existing positions, such as management. However, the industries in which these skills are necessary are a cross-section of the current workforce. The skills added will enable the individual to perform some basic data science skills. As noted by the website Data Science Central, "employees and managers who have the skills to deal with data will be in a better position to help their company and move up."[4] In particular, this certificate enables individuals to learn to ask the right questions and have an understanding of basic mathematical reasoning and statistics.

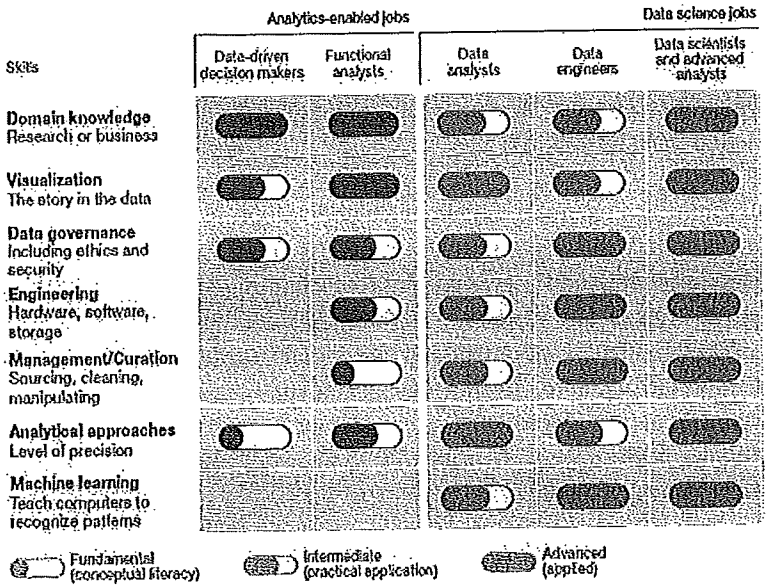
Many sources of job market data list data literacy or data analysis skills as important for a variety of professions. The following employment information was obtained from a source that describes the Data Science and Analysis (DSA) skill levels need for "analytics-enabled jobs" and "data-driven decision makers (as opposed to jobs as an analyst or data scientist).[5]

[3] "Job Posting Analytics." Emsi, 2017.3.

[4] "Why Every Manager Needs These Data Science Skills," Bernard Marr, Data Science Central: the online resource for big data practitioners, November 15, 2015.

[5] "Investing in America's Data Science and Analytics Talent: The Case for Action." Price Waterhouse Cooper, April 2017. Accessed Nov 29, 2017 at: https://www.pwc.com/us/dsa-skills.

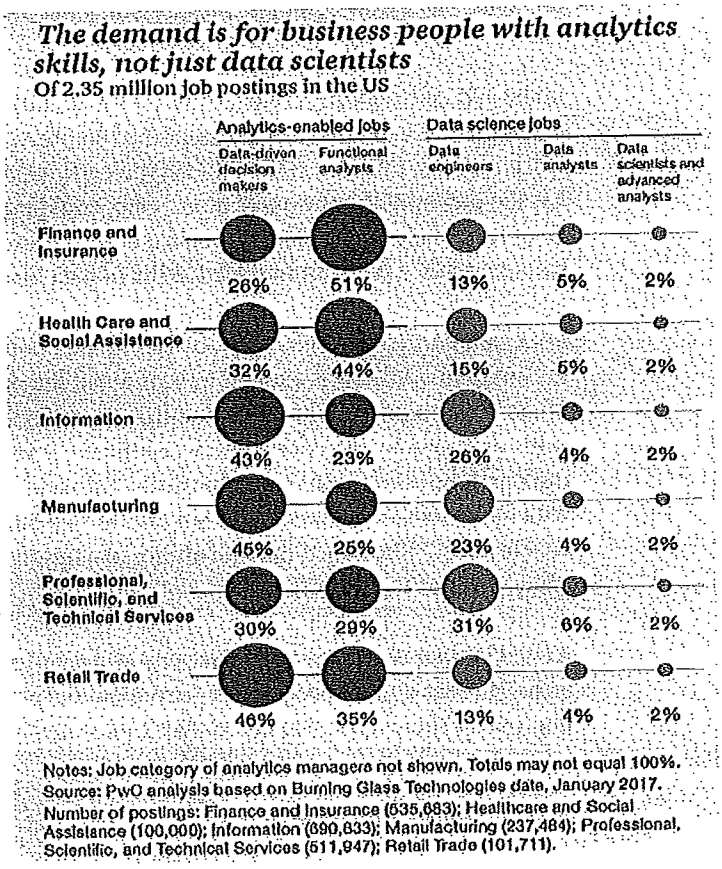
Figure 6: Layering DSA skills enables employers to better visualize roles
Use these skill groups as a guide to forming teams whose members collectively have a full skill set.



Source: PwC analysis based on Burning Glass Technologies data.

The table above, *Layering [Data Science and Analytics] Skills* presents skill sets and skill levels that produce strong employees or work teams in analytical roles. It shows that analytics-enabled jobs require very strong knowledge – the top of Bloom's taxonomy – of the operations of a business, the product, and clients. Intermediate-level abilities are necessary in explaining data and ethical data collection and privacy issues. Finally, data-driven decision makers need little or no exposure to database management, and only conceptual understanding of analytical techniques.

The same source describes both the low supply and high demand for data science and analytics skills. The graphic to the right, "The Demand is for... not just data scientists," shows that various industries, such as finance and insurance or health care have a demand for analytics-enabled jobs



that is considerably high. In all the industries indicated, the number of jobs for data-driven decision makers, which require the learning outcomes in this proposed program, are comparable to those for data scientists. In addition, in many industries, the number of analytics-enabled jobs exceeds those for data scientists. For example, within the high-paying finance and insurance industry, over 80% of the analysis-related job postings are for "analytics-enabled" positions rather than data scientists. Similarly, 26% more than the total of all data science jobs, require less than functional analysis skills.

Evidence from job postings and message boards suggests that individuals, who acquire skills in data and analysis thus possess some form of data literacy, add value to the current position and may set the individual up for promotion. For example, industry data indicate job postings for management occupations frequently list business development, customer relationship management, product development and management, sales management, forecasting, information systems, strategic planning, inventory management, business processes, and operations management as necessary hard skills. Among the most sought-after common skills are: management, operations, sales, problem solving, research, Microsoft Excel, decision-making, data analysis, and critical thinking. [6]

It is reasonable to predict that everyone in a management-type position will eventually be asked to prepare, analyze, or interpret data. Jeff Kauflin wrote an article for Forbes, "The Five Most In-Demand Skills for Data Analysis Jobs," that highlighted the need for these financial literacy skills. In particular, the most in demand skill is data analysis. "Trilogy defines it as the critical-thinking ability to interpret numbers. 'It's the ability to tell a story that gives insight into a problem,' says Dan Sommer, Trilogy's founder and CEO."[7]

In the area surrounding Anne Arundel Community College, there is an abundance of businesses that may find value in having a cohort of employees earn this certificate. From that perspective, when viewing this as a skills-added type certificate, the projected supply of prospective graduates has the potential to grow over time. One would expect that nearly every business, whether retail, hotel restaurant management, prisons, or government, has employees holding positions that would greatly benefit from added skills of data literacy.

For example, Amy Smith, CPA, of HeimLantz (a business accounting and consulting firm located in Annapolis, MD) was excited to hear about the possibility of a Data Literacy certificate. Most of the office managers hired at HeimLantz are bookkeepers. If they possessed the additional skills provided by the data literacy certificate, it would be possible to give them added responsibilities to assist on real projects. She said "it's not only important to have skills to deal with numbers at a detailed level but also to step back and look at the bigger picture...and draw conclusions." She added that the ability to analyze and interpret trends is critical to the success and growth of their business.

Keith Gardner served as an Operations Manager for Giant Food Corporation in the Jessup, MD area. He sees a great need for improvement/development of data literacy skills purely for improved efficiencies. He noted that if most managers had the skills and ability to draw

[6] "Job Posting Analytics." Emsi, 2017.3.
[7] "The Five Most In-Demand Skills for Data Analysis Jobs," by Jeff Kauflin, Forbes, July 20, 2017.

conclusions from data reports, then there is a possibility of significant cost savings. Mr. Gardner explained that reports on pay for overtime versus hiring a new associate were used to determine staffing needs. If others in similar positions possessed data literacy skills, they would be able to analyze the trends and potentially make cost savings decisions about staffing, scheduling, and production.

A contributor to Forbes wrote an article in 2014 entitled "Data Literacy – What It Is and Why None of Us Have It.[8]" The title directly describes a lack of qualified employees to handle big data. The author's suggested solution is for the advanced analysts to develop applets to present and summarize key information for others to interpret. With or without that solution, the article points to a shortage of workers who can ask questions to propose analyses and make sense of results or charts that analysts (or analysts' applets) provide.

D. Reasonableness of program duplication:

1. **Identify similar programs in the State and/or same geographical area. Discuss similarities and differences between the proposed program and others in the same degree to be awarded.**

Most certificate options in the surrounding area are offered through 4-year institutions, such as one offered through UMUC, "Foundations in Business Analytics Graduate Certificate." This program has a much deeper focus on big data, data science, managing databases, and programming. A certificate in data analysis at the community college is new and rather uncommon and would distinctly meet the needs of students interested in developing some knowledge of data literacy to supplement their current skills. Our proposed certificate in Data Literacy would support "Analytics-Enabled Jobs" (see above image from Burning Glass report).

Only two other community college programs exist in the surrounding area that would meet similar needs for students. The table below compares and contrasts each of these programs and our proposed program. Howard Community College has a noncredit certificate called Data Analysis. This program is described as a "three-part series" of 16 hours per part. The smaller time requirements – comparable to 3 or 4 credits – makes this program significantly different from our proposed one that includes 18 total credit hours.

Anne Arundel Community College	Proposed: • CTA 115 - Personal Computer Database Management Systems (4 credits) • ECO 232 – Business Statistics (3 credits) • ECO 233 – Data, Sampling and Analytics (3 credits) • ECO 270 – Data and Analysis Project Seminar (2 credits) • 6 cr electives (choose two of the courses listed below) BPA 126: Advertising & Sales Promotion (3 credits) BPA 127: eMarketing (3 credits) BPA 142: Principles of Management (3 credits) BPA 145: Leadership (3 credits)

[8] Maycotte, H.O. "Data Literacy – What It Is and Why None of Us Have It." Forbes Magazine, October 28, 2014. Accessed online Nov 30, 2017 from https://www.forbes.com/sites/homaycotte/2014/10/28/data-literacy-what-it-is-and-why-none-of-us-have-it/#32a67a0568bb.

	BPA 171: Principles of Supervision (3 credits) BPA 172: Human Resource Management (3 credits) BPA 231: Introductory Social Entrepreneurship & Nonprofit Management (3 credits) CJS 113: Penology (3 credits) CJS 135: Organized Crime (3 credits) COM 141: Group Communication and Leadership (3 credits) COM 230: Persuasive Message Strategies (3 credits) ECO 211: Principles of Economics I (3 credits) ECO 212: Principles of Economics II (3 credits) HLS 111: Intro to Homeland Security (3 credits) HLS 112: National Security Law (3 credits) HLS 113: Drugs, Addition, Corruption & Crime (3 credits) HLS 114: Maryland and Terrorism (3 credits)
Howard Community College	Data Analysis (noncredit, 4.8 CEUs) • Introduction to Data Analysis (1.6 CEUs) • Intermediate Data Analysis (1.6 CEUs) • Advanced Data Analysis (1.6 CEUs) Each is a one month course
Montgomery College	Data Science Certificate (16 credits total) • MATH 117 – Elements of Statistics (3 credits) • DATA 101 – Introduction to Data Science (3 credits) • DATA 110 – Writing and Communication in Data Science (3 credits) • DATA 201 – Statistical Methods in Data Science (3 credits) • DATA 205 – Capstone Experience in Data Science (4 credits)

There is also a new credit certificate at Montgomery College called Data Science. The coursework in that program includes report writing, analysis, and database administration. Due to the aforementioned concerns that a certificate in analysis or data science does not provide employment as a data scientist, our program provides a different, less advanced, more widely-applicable skill set that supports advancement in the workplace.

2. **Provide justification for the proposed program.**
Many online discussion boards used by recruiters and hiring managers, as well as the Bureau of Labor Statistics, provides descriptions of data analysis positions, indicates that data competencies are highly desirable, but also suggests that a certificate does not qualify a job seeker for employment as an analyst. We have, therefore, identified a niche skill set, represented in our program outcomes, that catapults workers with other training or experience toward promotion and other opportunities.

As previously mentioned, local businesses perceive there to be great value in their managers having improved data literacy skills to support their operations. Although other community colleges offer a similar program, they are not geographically close enough to meet the needs of the students AACC serves. Furthermore, as noted with the Job Analytics for Anne Arundel

County, there is a great need to enhance the data literacy skills of those in our community. This is further supported by comments shared earlier from Ms. Amy Smith at HeimLantz and Mr. Keith Gardner of Giant Food Corporation.

The pool of students we are targeting is very well served by what the program offers, and it is fully in the spirit of the mission of a community college, responding to the needs of our community. We are seeking to offer an affordable, flexible program that opens new opportunities to members of a diverse population. In addition, the skills gained through completion of the proposed certificate are largely transferrable across a wide range of occupations.

E. Relevance to high-demand programs at Historically Black Institutions (HBIs)

There is expected to be no negative potential impact on HBIs.

F. Relevance to the identity of Historically Black Institutions (HBIs)

There is expected to be no negative potential impact on HBIs.

G. Adequacy of curriculum design and delivery to related learning outcomes consistent with Regulation .10 of this chapter:

1. Provide a list of courses with title, semester credit hours and course descriptions, along with a description of program requirements.

	Certificate, Data and Analytics 18 Credits		
REQUIRED COURSES	**COURSE TITLE**	**CREDITS**	**PREREQUISITE**
CTA 115	Personal Computer Database Management Systems	4 Credits	
ECO 232	Business Statistics	3 Credits	Eligibility for gen ed math
ECO 233	Data, Sampling and Analytics	3 Credits	ECO 232
ECO 270	Data and Analysis Project Seminar	2 Credits	ECO 233 (pre- or co-req)
Completion of two courses from the following list. Substitutions allowed with permission of department chair of economics. Students are advised to choose based on their career goals.	(Elective)	6 Credits	(Possible math, English, or another course from this list)
LIST OF ELECTIVE COURSES: *BPA 126: Advertising & Sales Promotion (3 credits)* *BPA 127: eMarketing (3 credits)* *BPA 142: Principles of Management (3 credits)* *BPA 145: Leadership (3 credits)* *BPA 171: Principles of Supervision (3 credits)* *BPA 172: Human Resource Management (3 credits)* *BPA 231: Introductory Social Entrepreneurship & Nonprofit Management (3 credits)*			

CJS 113: Penology (3 credits)
CJS 135: Organized Crime (3 credits)
COM 141: Group Communication and Leadership (3 credits)
COM 230: Persuasive Message Strategies (3 credits)
ECO 211: Principles of Economics I (3 credits)
ECO 212: Principles of Economics II (3 credits)
HLS 111: Intro to Homeland Security (3 credits)
HLS 112: National Security Law (3 credits)
HLS 113: Drugs, Addition, Corruption & Crime (3 credits)
HLS 114: Maryland and Terrorism (3 credits)
HLS 211: Intelligence Analysis & Security Management (3 credits)
HLS 212: Weapons of Mass Destruction (3 credits)
HLS 260: Terrorism/Counterterrorism (3 credits)
HRM 250: Food, Beverage and Labor Cost Controls (3 credits)
HRM 251: Food and Beverage Operations Management (3 credits)
HRM 253: Catering Management (3 credits)
HRM 256: Hotel Property Management (3 credits)
HRM 260: Purchasing and Cost Controls (3 credits)
PBH 101: Introduction to Public Health (3 credits)
PBH 102: Introduction to Epidemiology (3 credits)
PBH 105: Essentials of Health Behavior (3 credits)
PBH 202: Emerging Public Health Issues (3 credits)

Course Descriptions

REQUIRED COURSES

CTA 115
Personal Com Database Management Systems **4 Credits**
Use Microsoft Access database management application software used on personal computers to study and manipulate data. Learn database design and implementation of object files such as file creation and setup, query processing, report generation and program creation. Use multiple files, indexing and database search, and record retrieval to solve practical problems through hands-on lab. This course prepares students to take the Microsoft Office Specialist (MOS) Access 2016 industry certification exam (extra fee). Lab fee $25. Note: Users with no prior software applications experience are encouraged to take one of the following before taking this course: CTA 100 or CTP 103.

ECO 232
Business Statistics **3 Credits**
Learn statistical analysis as an aid in business decision making through the use of descriptive statistics, probability, confidence intervals, hypothesis testing, chi square, analysis of variance, regression and correlation analysis. Lab fee $5. Prerequisite: Eligibility for any general education math course. Note: Also offered as ECO 232, credit will not be given for both BPA 232 and ECO 232.

ECO 233 *New Course*
Data, Sampling and Analytics **3 Credits**
Advances understanding of topics from ECO 232 with business and professional applications. Topics include sampling, biased sampling, sorting and cleaning data, performing some analyses, and interpreting results. Perform analysis and diagnostics for models with multiple explanatory variables, binary explanatory variables, and time variables. Interpret and apply results from these and additional models, including forecasting and binary dependent variables, to decision making. Prerequisite: ECO 232 and MAT 145 or higher math course.

ECO 270 *New Course*
Data and Analysis Project Seminar **2 Credits**
Practice developing data projects and interpreting reports. Extensive collaboration with peers working on instructor- and student-proposed projects. Determine data needs to answer questions about improving business and other activities; discuss data collection strategies, bias, and privacy concerns; and interpret results to improve decision making.

ELECTIVES: COURSE (APPLICABLE TRACKS)

BPA 126
Advertising & Sales Promotion **3 Credits**
Study promotional activities relating to industry, including the writing of advertising copy, layout and design of newspaper and print advertising, the production of radio and television commercials, media selection and the measurement of advertising effectiveness. Lab fee $10.

BPA 127
eMarketing **3 Credits**
Learn the core concepts of an eMarketing campaign. Explore email marketing, online advertising, social media, viral marketing, website copywriting and design, and other electronic tools used in supporting a

traditional marketing campaign. Note: Also offered as ESI 127; credit is not given for both BPA 127 and ESI 127.

BPA 142
Principles of Management **3 Credits**
Survey basic managerial functions with emphasis on planning, organizing, controlling and staffing activities as applied to general management.

BPA 145
Leadership **3 Credits**
Study leadership as a management style for effectively managing change. Includes an overview of supervision styles, creating a vision for leadership, developing effective leadership structures, analyzing factors influencing leadership and developing the manager's leadership goals.

BPA 171
Principles of Supervision **3 Credits**
Introduces the first level of management. Topics include short-range planning, training, motivation, evaluating workers, decision making, discipline, counseling problem employees and dealing with organized labor.

BPA 172
Human Resource Management **3 Credits**
Study a personnel manager's role regarding training and development, performance appraisal, labor relations and compensation. Includes laws affecting employee rights and management responsibility (ADA, civil rights, equal pay and sexual harassment).

BPA 231
Introductory Social Entrepreneurship & Nonprofit Management **3 Credits**
Provides an overview of how social entrepreneurs plan, organize, lead, manage, and market nonprofit or not-for-profit organizations. Students examine practical ways to define a community's needs in order to establish an organization's direction, work with a board of directors, and lead both volunteer and paid staff members. This course discusses how to use marketing and communications for developing and sustaining relationships with benefactors and beneficiaries. This course also provides discussion and practical application of other critical topics including strategic planning, operations management, human resource management, learning and knowledge management, legal requirements, public relations, political action, and financial management. Lab fee $10.

CJS 113
Penology **3 Credits**
Study the history and philosophy of corrections in federal, state and community systems along with probation, parole and other methods of rehabilitating offenders.

CJS 135
Organized Crime **3 Credits**
Provides a historical examination and analysis of organized crime worldwide. Explores the history of organized crime in the United States, the socioeconomic and political aspects of organized crime, and organized crime as a social subculture. Examines the legislative, judicial and law enforcement response to organized crime. Examines organized crime's role in unions and labor movements, organized crime and the media, organized crime commissions and organized crime internal and external policies. Note: Also offered as LGS 135; credit is not given for both CJS 135 and LGS 135.

COM 141
Group Communication and Leadership **3 Credits**
Learn principles and procedures for effective communication in small groups. Develop leadership skills for use in business, community, and other task-oriented work teams. Gain experience with various types of formal and informal group organization methods, member roles, and communication formats. Evaluate group processes and outcomes in interpersonal, peer and virtual groups and teams. Prerequisite: Eligibility for ENG 111 or ENG 115 or ENG 121 or permission of the department chair.

COM 230
Persuasive Message Strategies **3 Credits**
Learn cutting-edge persuasive communication strategies used in interpersonal communication, including the areas of advertising and political campaigns. Examine current research on persuasion and how the media frames issues. Gain the knowledge and skills to create and evaluate persuasive messages. Note: Eligibility for ENG 111 or ENG 115 or ENG 121 is strongly recommended.

ECO 211
Principles of Economics I **3 Credits**
Part of a two-term sequence focusing principally on macroeconomic theory and policy. Major topics include national income accounting (GDP); unemployment, inflation and business cycles; and fiscal and monetary policies. Recommend ECO 211 be taken prior to ECO 212. Prerequisite: Eligibility for MAT 137.

ECO 212
Principles of Economics II **3 Credits**
Part of a two-term sequence focusing on microeconomic theory and international economics. Topics include analysis of consumer behavior, economic behavior of the firm under varying conditions, resource allocation, comparative advantage and balance of payments. Recommend ECO 211 be taken prior to ECO 212. Prerequisite: Eligibility for MAT 137.

HLS 111
Intro to Homeland Security **3 Credits**
Introduces students to the vocabulary and important components of Homeland Security. Explores the state, national, and international laws impacting Homeland Security. Includes an examination of the most critical threats confronting Homeland Security.

HLS 112
National Security Law **3 credits**
Examines the revolutionary age in which we live and how national security law is changing and being redefined to address that revolution. No area within the law has been more significantly affected by the September 11th terrorist attack on the United States than the law related to national security. As successive administrations wrestle with defining "jurisdiction," national security law takes on an ever increasing importance in a world that is drawn even closer together through "globalization." This course will analyze the functioning of national security laws and their impact on society. It will also balance United States Constitutional principles against the need for security. Prerequisite: HLS 111 or permission of director.

HLS 113
Drugs, Addiction, Corruption & Crime **3 Credits**
Explore the major phases in the illegal drug trade, including the growing, processing, transporting, distributing, consuming and financing of the product. Study the efforts to combat the influence of illegal

drugs at each step in the process. Focus on the roles of the drug dealers, the government, the media, and society in general and the causes and consequences of illegal drugs. Prerequisite: HLS 111 or permission of director of homeland security institute.

HLS 114
Maryland and Terrorism **3 Credits**
Introduces students to the potential terrorist threats that can affect the typical citizen. Provides thoughtful suggestions as to how to enhance personal security. Examines the efforts of local, state and federal governments to combat terrorism. Also explores the impact terrorist threats have on local societies. Prerequisite: HLS 111 or permission of department chair.

HLS 211
Intelligence Analysis & Security Management **3 Credits**
Examines intelligence analysis and its indispensable relationship to the security management of terrorist attacks and other threats. Explores vulnerabilities of our national defense and private sectors, as well as the threats posed to these institutions by terrorists, man-made disasters, and natural disasters. Students will discuss substantive issues regarding intelligence support of Homeland Security measures implemented by the United States and explore how the intelligence community operates. Lab fee $20. Prerequisite: HLS 111 or permission of director.

HLS 212
Weapons of Mass Destruction **3 credits**
Surveys the primary instruments of destruction and death, known as weapons of mass destruction (WMD), used or sought to be used by terrorists. Addresses the definition, categories, characteristics, capabilities, deployment and impact of nuclear, biological, chemical, radiological, and conventional weapons of mass destruction. Focuses on the fundamentals of first responders and operational level responses to weapons of mass destruction disaster, including planning and training. Prerequisite: HLS 111 or permission of director.

HLS 260
Terrorism/Counterterrorism **3 Credits**
Provides a historical analysis of terrorism. Introduces the historical and contemporary issues relevant to domestic and international terrorism. Examines methods utilized by law enforcement and intelligence agencies in preventing and detecting terrorism. Also explores the process utilized for collecting and documenting evidence for the capture and effective prosecution of terrorists. Topics include the role of the media in covering, investigating and reporting terrorist events, and the constitutional and sociological dilemmas involved in investigating terrorist acts in democracies, such as the threats to privacy and individual rights. Note: Also offered as CJS 260, PSY 260 and SOC 260; credit is not given for HLS 260 and also CJS 260, PSY 260 and SOC 260.

HRM 250
Food, Beverage and Labor Cost Controls **3 Credits**
Study principles of food and beverage management as applied to foodservice operations. Emphasis is on systems of food and labor cost controls, budgets for food service operations and menu analysis, pricing and planning. Prerequisite(s): HRM 111 and eligibility for any general education mathematics course or permission of the Director of the HCAT Institute.

HRM 251
Food and Beverage Operations Management **3 Credits**
Explore techniques of proper service in hospitality establishments. Learn the organization of dining room

and table settings, with an introduction to textiles, glassware, flatware and china. Review the management and service of wine, beer and spirits. Train and test for national certification for the responsible service of alcoholic beverages and customer service. Lab fee $50. Note: Student must provide the required uniform.

HRM 253
Catering Management **3 Credits**
Designed to provide students with an overview of catering operations and management. Students prepare a business plan for a small private catering firm as well as review on premise catering, menu design and pricing, service standards and equipment purchases.

HRM 256
Hotel Property Management **3 Credits**
Examine property management concerns for hotels. Operational areas reviewed include housekeeping, security, risk management and maintenance. Special emphasis is given to feasibility studies, supply management and business forecasting. Course includes an introduction to labor relations, retention and departmental budgeting. Prerequisite: Eligibility for any general education mathematics or permission of the director of the HCAT Institute.

HRM 260
Purchasing and Cost Controls **3 Credits**
Learn principles of food and beverage purchasing and cost controls as applied to food-service operations. Study the procurement and control of food, beverage, equipment, small wares, furniture, fixtures, and textiles, as well as current systems of food and labor cost controls. Discuss budgets for food service operations, and menu analysis, pricing and planning. Prerequisite: HRM 111 and either 121 or 124 or permission of the Director of the HCAT Institute.

PBH 101
Introduction to Public Health **3 Credits**
Gain an overview of the principles of population health. Learn what determines disease and disability, how evidence is used to quantify the burden of disease, and how health professionals, the public health system and governmental structures contribute to the development of strategies for protecting health and reducing disease and disability. Prerequisites: Eligibility for ENG 111 or ENG 115 or ENG 121.

PBH 102
Introduction to Epidemiology **3 Credits**
Gain introductory background to the concepts that embody epidemiology and learn how health data is gathered, analyzed and applied to understanding health issues, and learn methods to measure outcomes. Apply basic skills in quantifying health variables and epidemiological applications. Prerequisite: MAT 135 and eligibility for ENG 111 or ENG 115 or ENG 121.

PBH 105
Essentials of Health Behavior **3 Credits**
Learn social and behavioral theories that guide understanding of health related behavior form the foundations of our health promotion and prevention efforts. Explore ways in which these theories and approaches are used in applied health promotion efforts. Prerequisite: Eligibility for ENG 111 or ENG 115 or ENG 121.

PBH 202
Emerging Public Health Issues **3 Credits**
Learn the historical context of the Healthy People initiatives and explore the data and process that was used to define the current objectives that will direct public health policy for the next decade.
Prerequisite(s): PBH 101.

PROGRAM DESCRIPTION: Provides functional skills and literacies in simple data analysis within a common statistical software package. Introduces advanced techniques such as binary variables and logistic regression and prepares students to read and interpret results using those techniques. Major emphasis is on the work before and after an analysis, such as proposing a question, collecting data, interpreting results, and applying findings to improved decision making.

2. **Describe the educational objectives and intended student learning outcomes.**
This program is intended for students already possessing an Associate's or Bachelor's degree who seek a career-boosting credential in the growing field of analytics. Data science training has grown and become very specific, so most certificates, including this one, introduce the field. They are unlikely to lead to a position with the title "data scientist" or "analyst." However, as data has become a more important piece of nearly all business decisions, the exposure to this element provides competencies and training that provide an edge over other job candidates, such as for acquiring or advancing in managerial positions.

PROGRAM OUTCOMES:

Successful completion of this program indicates a student is able to	*Course(s) in the program that develop and assess this outcome include*
Compose questions about an action or process that can be answered with the help of data and data analysis	(electives) ECO 232 ECO 233 ECO 270
Determine necessary characteristics of a data set and its variables to address a given question related to the chosen elective track.	ECO 232 ECO 233 ECO 270
Determine what questions related to the chosen elective track could be addressed with a given data set	ECO 232 ECO 233 ECO 270
Manage data sets as needed to calculate descriptive statistics, construct tables or graphs, and perform hypothesis tests.	CTA 115 ECO 232 ECO 233 ECO 270
Use statistical software to perform hypothesis tests and estimate simple linear regression models.	ECO 232 ECO 233

	ECO 270
Apply results of reports including hypothesis tests, linear regressions, and logistic regressions to situations related to the chosen elective track.	ECO 232 ECO 233 ECO 270

3. **Discuss how general education requirements will be met, if applicable.**
   N/A
4. **Identify any specialized accreditation or graduate certification requirements for this program and its students.**
   N/A
5. **If contracting with another institution or non-collegiate organization, provide a copy of the written contract.**
   N/A

H. Adequacy of articulation

N/A

I. Adequacy of faculty resources (as outlined in COMAR 13B.02.03.11). This certificate adds two new courses but utilizes other courses and faculty members already in place. The economics department at AACC currently employs 3 full-time faculty and 6 adjunct faculty. The majority of our course offerings are taught by full-time faculty. All full-time faculty members of economics hold doctorates in economics. Below please find a list of the full-time faculty teaching courses in the Data Literacy beyond the required:

Faculty	Degree	Academic Rank	Appointment	Courses
Gretchen Mester	PhD, Economics	Professor	Full-Time	ECO 232, 233, 270
Paul Larson	PhD, Economics	Assistant Professor	Full-Time	ECO 232, 233, 270
Uzma Qureshi	PhD, Economics	Associate Professor	Full-time	ECO 232, 233, 270

J. Adequacy of library resources (as outlined in COMAR 13B.02.03.12).

The Andrew G. Truxal Library currently holds resources successfully supporting the first two years of Data Literacy. Resources are constantly reviewed for current content and availability. Library staff were consulted during the program development phase and determined that no additional resources would be required to adequately support this program.

K. Adequacy of physical facilities, infrastructure and instructional equipment (as outlined in COMAR 13B.02.03.13)

The new courses will require use of existing computer labs. Those labs will need to be equipped with a statistical software package (STATA) with a multi-user license (see equipment and expenditures below). The current classroom spaces, equipment, and computer technologies are adequate to support this program.

L. **Adequacy of financial resources with documentation (as outlined in COMAR 13B.02.03.14)**

TABLE 1: RESOURCES:					
Resource Categories	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**
1. Reallocated Funds	$0	$0	$0	$0	$0
2. Tuition/Fee Revenue (c + g below)	$6,600	$6,600	$7,920	$9,900	$9,900
a. Number of F/T Students	0	0	0	0	0
b. Annual Tuition/Fee Rate	0	0	0	0	0
c. Total F/T Revenue (a x b)	0	0	0	0	0
d. Number of P/T Students	10	10	12	15	15
e. Credit Hour Rate	$110	$110	$110	$110	$110
f. Annual Credit Hour Rate	6	6	6	6	6
g. Total P/T Revenue (d x e x f)	$6,600	$6,600	$7,920	$9,900	$9,900
3. Grants, Contracts & Other External Sources	0	0	0	0	0
4. Other Sources	0	0	0	0	0
TOTAL (Add 1 – 4)	$6,600	$6,600	$7,920	$9,900	$9,900

Financial Data – Resources

1. **Reallocated Funds:**
   None

2. **Tuition and Fee Revenue:**
   We predict modest initial enrollment in the certificate program of approximately 10 students. More students are anticipated once the program is fully marketed. Most students will likely be part-time only students as the assumption is most will currently hold a full-time position working and will be taking one to two courses per semester. Tuition & Fees are estimated to increase by 2% each year.

3. **Grants and Contracts:**
   None

4. **Other Sources:**
   None

5. **Total Year**
   None

TABLE 2 - EXPENDITURES					
Expenditure Categories	Year 1	Year 2	Year 3	Year 4	Year 5
1. Faculty (b+c below)	$0	$0	$7,548.96	$7,699.94	$7,853.93
a. # FTE	$0	$0	0.25	0.25	0.25
b. Total Salary	$0	$0	$7,012.50	$7,152.75	$7,295.81
c. Total Benefits	$0	$0	$536.46	$547.19	$558.13
2. Admin. Staff (b + c below)	$0	$0	$0	$0	$0
a. # FTE	0	0	0	0	0
b. Total Salary	$0	$0	$0	$0	$0
c. Total Benefits	$0	$0	$0	$0	$0
3. Support Staff (b + c below)	$0	$0	$0	$0	$0
a. # FTE	0	0	0	0	0
b. Total Salary	$0	$0	$0	$0	$0
c. Total Benefits	$0	$0	$0	$0	$0
4. Equipment	$3,615	$0	$0	$0	$0
5. Library	$0	$0	$0	$0	$0
6. New or Renovated Space	$0	$0	$0	$0	$0
7. Other Expenses	$0	$0	$0	$0	$0
TOTAL (Add 1 – 7)	$3,615.00	$0.00	$7,548.96	$7,699.94	$7,853.94

Financial Data – Expenditures

1. **Faculty Funds:**
   We estimate that by the third year we will need a 0.25 adjunct faculty member as the program grows. Salaries are estimated to increase by 2% each year.
2. **Admin. Staff Funds:**
   None.
3. **Supportive Staff Funds:**
   None.
4. **Equipment:**
   This program requires the purchase of licenses for software for data analysis. A statistical software package such as STATA has an initial total cost of $3,615 (perpetual license) with maintenance only necessary for version upgrades. The total cost includes the student lab license is which is $2,190 for a 21-user STATA/IC 15 student Lab license and the faculty license which is $1,425 for 4 single-user STATA/IC 15 licenses or 4-user STATA/IC 15 network licenses.
5. **Library:**
   None.
6. **New or Renovated Spaces:**
   None.
7. **Other Expenses:**