



Cover Sheet for In-State Institutions

New Program or Substantial Modification to Existing Program

Institution Submitting Proposal	
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Each action below requires a separate proposal and cover sheet.

- | | |
|-----------------------------|---|
| New Academic Program | Substantial Change to a Degree Program |
| New Area of Concentration | Substantial Change to an Area of Concentration |
| New Degree Level Approval | Substantial Change to a Certificate Program |
| New Stand-Alone Certificate | Cooperative Degree Program |
| Off Campus Program | Offer Program at Regional Higher Education Center |

Payment Submitted:	Yes	Payment Type:	R*STARS # Check #	Payment Amount:	Date Submitted:
Department Proposing Program					
Degree Level and Degree Type					
Title of Proposed Program					
Total Number of Credits					
Suggested Codes			HEGIS:	CIP:	
Program Modality			On-campus	Distance Education (fully online)	Both
Program Resources			Using Existing Resources	Requiring New Resources	
Projected Implementation Date <small>(must be 60 days from proposal submission as per COMAR 13B.02.03.03)</small>			Fall	Spring	Summer Year:
Provide Link to Most Recent Academic Catalog			URL:		
Preferred Contact for this Proposal			Name:		
			Title:		
			Phone:		
			Email:		
President/Chief Executive			Type Name:		
			Signature:		Date:
			Date of Approval/Endorsement by Governing Board:		

Revised 1/2021

ANNE ARUNDEL COMMUNITY COLLEGE

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Dr. Dawn Lindsay

President

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September 1, 2023

Dr. Sanjay Rai
Acting Secretary of Higher Education
Maryland Higher Education Commission
6 N. Liberty Street
Baltimore, MD 21201

Dear Dr. Rai:

Anne Arundel Community College is requesting approval for a new Computer Science Transfer - Data Science, Associate of Science degree. Please see the attached proposal to support this request.

If you have any questions, please contact Dr. Tanya Millner, Provost/Vice President for Learning at tcmillner@aacc.edu or (410) 777-2332.

We appreciate the Maryland Higher Education Commission's consideration of this request.

Sincerely,

A handwritten signature in black ink, appearing to read "D. Lindsay", is written over a horizontal line.

Dr. Dawn Lindsay
President

cc: Tanya Millner, Ed.D., Provost/Vice President for Learning
Tina Smith, Ph.D., Associate Vice President for Learning
Lance Bowen, Ph.D., Dean, Science, Technology, and Education
Nanci Beier, M.A., Registrar
Tara Carew, M.B.A., M.Ed., Director, Financial Aid

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Computer Science Transfer – Data Science, Associate of Science

A. Centrality to Institutional Mission and Planning Priorities:

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

Consistent with the mission of Anne Arundel Community College (AACC) to respond to the needs of our diverse community by offering high quality, affordable, accessible, and innovative lifelong learning opportunities, this proposal demonstrates the need for the establishment of the Computer Science Transfer – Data Science, Associate of Science (A.S.) program.

The Data Science Degree program will focus on: acquiring data from different sources; data cleansing; data storage and querying; and data presentation. All data sets that are used in the program will be freely available to the students. Students will be allowed to choose data sets that are of interest to them. This degree program is designed for students preparing to transfer to a four-year institution to obtain a baccalaureate degree in Data Science. Students can move into specialized fields of big data, machine learning, artificial intelligence, or data analytics.

The world today contains more data than ever. Trends can be predicted by looking at data. Business and industry rely on data to make decisions about these trends. Marketing decisions can be made based on these trends. Business operations can be scaled based on these trends. Data science students learn to transform and interpret raw data into meaningful information.

The program will be overseen by the Department of Computer Science. Prospective students may be already employed in the industry (career switchers or builders) but may not have the respective formal training or are using older methodologies (databases), as well as for high school graduates (career starters).

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

AACC is committed to helping students achieve their educational goals, which is the theme of AACC's strategic plan. Every decision is grounded in how students can be helped to achieve academic excellence and remain engaged with their own goals. The college's strategic plan, Engagement Matters II: Excellence through Innovation, 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, which is the fundamental foundation upon which the work and continued reputation as a college of distinction is built. This new program strongly supports the college's strategic goals of progress and completion.

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- 3. Provide a brief narrative of how the proposed program will be adequately funded for at least the first five years of program implementation. (Additional related information is required in section L.)**

The funding required to support expenses for this program already exist in the college's operating budget and will continue to be adequately funded for the first five years of program implementation. No additional funding is required except for the cost associated with providing additional faculty coverage should enrollment grow.

- 4. Provide a description of the institution's a commitment to:**

- a) Ongoing administrative, financial, and technical support of the proposed program.**

Anne Arundel Community College is committed to the ongoing administrative, financial, and technical support for this program. This program will be implemented by AACC's Department of Computer Science. Existing resources within the department are adequate to support the data science program. Technical support will be provided by the onsite technical call center through AACC's Information and Instructional Technology (IIT) division. The college's IDEA Lab will provide support and maintenance of the college's learning management system (LMS).

This academic proposal is proceeding with the full support of the department chair, assistant dean, dean and provost/vice president under which the program was developed. The program also has the full support of the offices of the president and Board of Trustees.

- b) Continuation of the program for a period of time sufficient to allow enrolled students to complete the program.**

Anne Arundel Community College is committed to providing all students an opportunity to complete their program of study. Students may elect to graduate from a program by meeting the curriculum requirements as outlined in the catalog in effect during their initial enrollment. The academic department will provide all students affected by such decisions with assistance in choosing appropriate courses and programs for completion.

B. Critical and Compelling Regional or Statewide Need as Identified in the State Plan:

The field of data science continues to have a demonstrated need for high-skilled workers. With the approval of this program, AACC (as an open access institution) will be particularly well-positioned to offer a program that seamlessly transfers into a bachelor's degree program.

The Career One Stop (sponsored by the U.S. Department of Labor) reports that the demand for data scientists will remain high, experiencing a 31% increase from 2020-2030, with an average salary currently at about \$100,000. Searches on websites such as Indeed.com, which includes

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jobs from the private and public sectors, consistently demonstrate numerous job postings within the region. This program will provide quality data science professionals that help business and industry address shortages in the workforce.

a) Societal needs, including expanding educational opportunities and choices for minority and educationally disadvantaged students at institutions of higher education:

This program greatly expands the educational opportunities and choices for minority and educationally disadvantaged students in the county and beyond. As an open access institution, approval of this proposal will position AACC to draw on the county's increasingly diverse populations to recruit students with an aptitude to develop the requisite skills and cultural competencies for functioning effectively and appropriately in their field of choice. As of fall 2022, over 43% of credit students at the college identified as racial/ethnic minorities. While many in the county prosper, there is also an increasing income gap among residents, with 6.2% living below the poverty level (U.S. Census, Quick Facts Anne Arundel County, July 2022). The percentage of overall students receiving Pell grants in fall 2022 was 21.8%.

b) Provide evidence that the perceived need is consistent with the *Maryland State Plan for Postsecondary Education*.

The 2022 Maryland State Plan for Higher Education outlines three primary goals for the higher education community in Maryland. One of the goals is to ensure equitable access to affordable and high-quality postsecondary education for all Maryland residents.

In addition, another goal is promoting and implementing practices and policies that will ensure student success. According to the Maryland Education Code Ann. § (10-204) public institutions of higher education are required to teach and train students for careers and provide public services for citizens of the State. This program will meet an existing need for highly skilled employees in data science.

C. Quantifiable and Reliable Evidence and Documentation of Market Supply and Demand in the Region and State:

1. Describe potential industry or industries, employment opportunities, and expected level of entry (ex: mid-level management) for graduates of the proposed program.

The proposed degree is under the Department of Computer Science and was developed for individuals that intend to specialize in analyzing and manipulating data. Prospective students may be already employed in the industry (career switchers or builders) but may not have the respective formal training or are using older methodologies, as well as for high school graduates (career starters).

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This degree provides a clear pathway for students looking to enter the growing fields of data analytics, data science and data engineering. It also allows incumbent workers to add data science skills to their current portfolio to further enhance their job prospects.

2. Present data and analysis projecting market demand and the availability of openings in a job market to be served by the new program.

Searches on websites such as Indeed.com, which includes jobs from the private and public sectors, consistently demonstrate thousands of job postings in the data science field within the region. This program will provide quality professionals that help business and industry address shortages in the workforce.

3. Discuss and provide evidence of market surveys that clearly provide quantifiable and reliable data on the educational and training needs and the anticipated number of vacancies expected over the next 5 years.

A recent search on www.onetonline.net found that in the State of Maryland, there were 33,000 employees in the data science field. The data science profession has a faster than average job outlook when compared to other occupations. Currently, there are multiple job postings within a fifteen-mile radius of Arnold, MD based on the job search engine Indeed.com, which includes jobs from the private and public sector. This program will not only help provide quality professionals to the community, but it will also help to alleviate a shortage in the workforce.

4. Provide data showing the current and projected supply of prospective graduates.

Currently, the need for data scientists is large and expected to grow even higher over the next decade. Several community colleges in Maryland offer a similar degree program in data science: Frederick Community College; Harford Community College; Howard Community College; and Montgomery College. While the anticipated need for employees in the state is in the thousands, these programs provide hundreds of graduates each year.

The number of graduates in this degree program is projected to be five by year two, with the expectation of 25 by year five.

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.

While the anticipated need for employees in Maryland is in the thousands, the associate degree programs in the table below provide hundreds of graduates each year. Given the high demand for skilled workers in this industry, there is not a concern about program duplication.

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College	Degree	Degree name
Montgomery College	Certificate	Data Science (leading to the General Studies Associate of Arts Degree)
Harford Community College	Associate	Data Science (AS)
Frederick Community College	Associate	Data Science Area of Concentration within the A.A.S. in STEM Technology
Howard Community College	Certificate	Data Analysis
Howard Community College	Certificate	Data Business Analytics

2. Provide justification for the proposed program.

Development of the Data Science degree program was recommended as the result of both the internal department's academic program review process and by the college's industry advisory board. This degree will provide a clear pathway for students to directly enter the field of data science or transfer to a four-year degree in a wide range of majors.

E. Relevance to High-demand Programs at Historically Black Institutions (HBIs)

At this time, this program is not currently expected to impact Maryland's HBIs.

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

This program does not impact Maryland's HBIs.

G. Adequacy of Curriculum Design, Program Modality, and Related Learning Outcomes (as outlined in COMAR 13B.02.03.10):

1. Describe how the proposed program was established, and also describe the faculty who will oversee the program.

The proposed program grew out of the guidelines and directions of the industry advisory board, as well as the recent program review. Professor Krysten Hall is a full-time Professor and director of the Computer Science program. She holds a Master of Science in Instructional Systems Development and joined the AACC faculty in 1999.

2. Describe educational objectives and learning outcomes appropriate to the rigor, breadth, and (modality) of the program.

Anne Arundel Community College provides programs that meet the ever-changing information technology needs of business and industry and qualify graduates to obtain employment

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opportunities that provide family-sustaining wages and contribute to quality of life. Learning outcomes for this degree program include:

- Design, correctly implement and document solutions to computational problems.
- Analyze a problem and identify and define the computing requirements appropriate to its solution.
- Use current techniques, skills, and tools necessary for computing practice.
- Apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of software.
- Demonstrate an understanding of the complete System Development Lifecycle from planning and problem analysis through implementation and documentation.
- Design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs.

3. Explain how the institution will:

a) Provide for assessment of student achievement of learning outcomes in the program

Anne Arundel Community College is committed to ensuring that its students and graduates are among the best-prepared citizens and workers of the world by offering high quality, affordable, and accessible learning opportunities while also continuing the institution's excellence, accountability, and continuous learning. To this end, practices and procedures are established to ensure faculty, staff, and administrators systematically assess student learning outcomes at the course, program, and institution levels. All academic departments maintain assessment plans for their programs and courses that outline learning outcomes, curriculum mapping, assessments, and data collection cycles.

Assessments to measure student learning take many forms including exams, research papers and other written assignments, class discussions, performances, and lab exercises. These assessment items are mapped to course-level and program-level learning outcomes. Measures of student learning are aggregated to the appropriate level (course, program, institution) to provide the basis for faculty discussions on curriculum, pedagogy, and assessment. In addition to periodic program-level learning outcomes assessment, all credit degree and certificate programs are reviewed on a 4-year cycle for evidence of: program retention and completion, success in program foundational courses, enrollment, value-added, and assessment practices. Program review also includes a review of program outcomes.

b) Document student achievement of learning outcomes in the program

Program learning outcomes will be assessed through final projects and exams in the program's required courses. The department documents evidence of student achievement of learning outcomes on a cyclical basis in the college's assessment management system. Documentation

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includes learning outcomes, curriculum maps, assessment plans, findings (data and analysis), and action plans.

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

General Education Requirements (32-33 credits):

ENG 101 Academic Writing and Research 1: (3 credit hours)

Learn critical writing, reading, and thinking strategies. Write multiple essays, culminating in an instructor-guided research paper. Analyze a variety of texts and identify their cultural, historical, and social contexts. Develop foundational information literacy, academic research, and documentation skills. Prerequisite: Appropriate placement into ENG 101. Note: A grade of C or better is required to satisfy the general education requirement.

ENG 102 Academic Writing and Research 2: (3 credit hours)

Develop advanced critical writing, reading, and thinking skills. Compose analytical and argumentative essays, culminating in the production of an independent, extensive, multiple-source, fully documented research paper. Analyze a variety of texts through close reading and explore their cultural, historical, and social contexts. Learn advanced research techniques, including formulation of research questions, identification of multiple audiences, analysis of rhetorical situations, and ethical research tactics. Prerequisite: Successful completion of ENG 101/ENG 101A or ENG 101H with a grade of C or better. Note: A grade of C or better is required to satisfy the general education requirement.

Arts and Humanities: (6 credit hours)

Select from approved General Education courses in the college catalog.

Biological and Physical Sciences (8 credit hours)

Two lab sciences required. See [General Education Biological and Physical Sciences Requirements](#) for a list of approved courses. Students should check with their transfer institutions for specific course requirements.

Mathematics (3-4 credit hours)

For Computer Science Transfer MAT 191

For Data Science Transfer MAT 135

MAT 135 Statistics: (3 credit hours)

Use meaningful data to explore concepts in probability and statistics including measures of central tendency and dispersion. Develop statistical literacy by studying graphical representations of data, discrete and continuous probability distributions, and sampling techniques and theory. Construct and interpret confidence intervals, find lines of best-fit, and

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perform hypothesis tests for means, proportions, and independence. Technology use is required throughout the course for statistical analyses.

MAT 191: Calculus and Analytic Geometry 1: (4 credit hours)

Find limits, derivatives, and integrals of functions. Apply these concepts to explicit, implicit, algebraic, trigonometric, and transcendental functions, using derivatives to analyze graphs and to model real situations.

Social and Behavioral Sciences & Diversity: (6 credit hours)

Two different disciplines required. See General Education Social and Behavioral Sciences Requirements for a list of approved courses. Students should check their transfer institutions for specific course requirements.

Wellness General Education Requirements: (3 credits)

See General Education Wellness Requirement for list of approved courses.

Program Requirements: (12 credits)

CTP - 115 - Introductory Object-Oriented Program Analysis and Design (4 credit hours)

Learn analysis and design problem-solving techniques to prepare for programming in any language. Learn about object-oriented design, development, and related security techniques. Analyze specifications, use design tools such as pseudocode and Unified Modeling language (UML) diagrams to develop classes and objects, consider examples of common program designs, and implement object-oriented designs in a high-level language.

CTP - 150 - Computer Science 1 (4 credit hours)

Use fundamental design principles and problem-solving techniques introduced in CTP 115 to develop computer algorithms. Implement algorithms as programs coded in Java, an object-oriented programming language. Learn the data types, control structures, classes, arrays, and I/O in the Java programming language. Learn recursion, inheritance, polymorphism, and exceptions. Emphasize style, documentation, solution robustness, and conformance with specifications throughout course work.

CTP - 250 - Computer Science 2 (4 credit hours)

Learn advanced algorithms and programming concepts, and the role of abstract data types in software development, including stacks, queues, linked lists, recursion, trees and file manipulation. Discuss and implement secure programming concepts and skills throughout the course.

Data Science Transfer Area of Concentration Requirements (16 Credits):

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CTP - 140 – Database Foundations, SQL/NoSQL (3 credit hours)

Learn database fundamentals while working with both relational (SQL) and non-relational (NoSQL) architectures. Learn to create, update, delete, and retrieve data from a traditional relational database using SQL as well as non-relational databases using NoSQL.

CTP - 160 – Python (3 credit hours)

Develop computer programs in the Python programming language using fundamental design principles and problem-solving techniques. Learn data types, control structures, classes, multithreading, client/server programming, data structures to organize and manipulate data, and I/O in the Python programming language. Learn to apply Python to computer security topics. Emphasize style, documentation, solution robustness, and conformance with specifications throughout course work.

CTP - 214 - Data Visualization and Data Wrangling (3 credit hours)

Explore data wrangling from widely used data formats and sources (like web pages, tweets, PDF files) and shape it to enable data-driven decisions. Learn to assess the quality of data and explore best practices for data cleaning.

CTP - 260 - Python for Data Science (3 credit hours)

Learn scientific computing and data analysis techniques to analyze and visualize data using Python libraries. Apply common descriptive statistics including finding the mean, median, mode and standard deviation to data sets. Plot and graph data sets using Python libraries. Emphasize style, documentation, solution robustness, and conformance with specifications throughout coursework.

And

CTP - 210 - Statistical Programming in R (4 credit hours)

Install and configure the statistical programming environment. Read data into R, access R packages, write and use R functions, and organize and comment R code. Apply statistical computing in the R programming language.

Or

MAT - 235 - Introduction to Data Science (4 credit hours)

Apply standards and practices for collecting, organizing, managing, and exploring data, combining principles and skills from statistics and computer programming with a goal of using these tools to provide information to decision makers. Topics include causality, single and multivariable data manipulation, data visualization and generation, statistical inference, statistical modeling, and machine learning.

5. Discuss how general education requirements will be met, if applicable.

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Please see question 4 above.

- 6. Identify any specialized accreditation or graduate certification requirements for this program and its students.**

Not applicable.

- 7. If contracting with another institution or non-collegiate organization, provide a copy of the written contract.**

Not Applicable.

- 8. Provide assurance and any appropriate evidence that the proposed program will provide students with clear, complete, and timely information on the curriculum, course and degree requirements, nature of faculty/student interaction, assumptions about technology competence and skills, technical equipment requirements, learning management system, availability of academic support services and financial aid resources, and costs and payment policies.**

AACC provides all students with clear, complete, and timely information on the curriculum, course, and degree requirements, nature of faculty/student interactions, assumptions about technology competence and skills, technical equipment requirements, learning management system, availability of academic support services, and financial aid resources, and costs and payment policies.

Anne Arundel Community College ensures accuracy of program presentation in advertising, recruiting and admissions materials by using procedural processes through a connected curriculum/catalog software system where content managers and the college catalog editor review and update in a collegial partnership with our Strategic Communications (Marketing) department. If this program is approved, the catalog will present clear and accurate curricular information to include course and degree requirements, available course formats and information about technology assumptions about competency, equipment requirements, and the learning management system.

Each student also receives a course syllabus from their instructor that outlines the course content to be covered and the nature of faculty/student interactions as appropriate for that course and course format. For online courses or courses with an online component, students are made aware about assumptions of technology competence and skills, technical equipment requirements, and the College is learning management system (Canvas). This information for each course may be provided via the course syllabus or directly by the instructor during the first few class sessions.

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In addition, each new student is encouraged to attend an orientation session, either online or in person. Orientation offers an introduction to all the various aspects of academic and campus life at AACC. Students learn tips for academic success, hear a variety of AACC student success stories, learn more about MyAACC, the student portal, meet faculty members, join a student organization, meet fellow students, and take a campus tour.

Students have access to the complete range of services available at AACC in support of achieving their educational goals. The college website, catalog, and a myriad of other materials outline the comprehensive services available to students: Academic Services, Student Records, Campus Amenities, Careers & Employment, Disability Support Services, Health & Personal Counseling Services, Student Achievement & Success, and Technology.

The majority of AACC credit students receive some form of financial aid, scholarships, or financial support. AACC's Financial Aid & Veterans Benefits office provides financial assistance to students and families, allowing them to participate fully in the total educational experience. More information on how to apply for scholarships and grants is found on the college website, as is information on tuition, fees, and methods of payment.

All admissions and outreach materials are the same for all students, and accurately represent programs and services available. Notice of nondiscrimination and information on Title IX, ADA, and Title 504 contacts are provided.

9. Provide assurance and any appropriate evidence that advertising, recruiting, and admissions materials will clearly and accurately represent the proposed program and the services available.

Anne Arundel Community College ensures accuracy of program presentation in advertising, recruiting, and admissions materials by using procedural processes through a connected curriculum/catalog software system where content managers and the college catalog editor review and update in a collegial partnership with Strategic Communications. Anne Arundel Community College's homepage has links to six major headings, two of which directly apply to college majors and credit courses (earn a degree, certificate, or college credits, and earn college credits while in high school). The main page for each heading has relevant advertising, recruiting and admissions information. In addition, across the top of every page are direct links to Programs & Courses, Apply & Register, Costs & Paying for College, and Resources for Students, Campus Life & Activities, and About Us.

H. Adequacy of Articulation

If applicable, discuss how the program supports articulation with programs at partner institutions. Provide all relevant articulation agreements.

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Anne Arundel Community College coursework transfers to Maryland public institutions based on the rules outlined in the Code of Maryland Regulations (COMAR 13B.06 General Education and Transfer). This program will establish a clear transfer pathway for students. The department will engage and partner with four-year public and private Maryland institutions to discuss Memoranda of Understanding to ensure seamless transfer. Courses in this program have outcomes that align with similar courses at other Maryland institutions.

I. Adequacy of Faculty Resources (as outlined in COMAR 13B.02.03.11).

1. Provide a brief narrative demonstrating the quality of program faculty.

The Department of Computer Science currently employs six full-time faculty. The table below provides more information on departmental faculty.

Name	Terminal Degree, Title and Field	Academic Title	Status	Courses
Wendy Chasser	MS, Computer Science	Associate Professor	FT	CTP 115, CTP 150, CTP 160
Krysten Hall	MA, Instructional Systems	Associate Professor	FT	CTP 115, CTP 150, CTP 214, CTP 250, CTP 260
Cheryl Heemstra	M.B.A.	Professor	FT	CTP 103
Ruimin Hu	D.Sc., Computer Science	Professor	FT	CTP 115, CTP 150, CTP 140, CTP 210, CTP 250
Xi Kramer	MS, Computer Science	Instructor	FT	CTP 115, CTP 150, CTP 160
Sangeeta Maheswari	MS, Computer Science	Associate Professor	FT	CTP 115

2. Demonstrate how the institution will provide ongoing pedagogy training for faculty in evidenced-based best practices, including training in:

a) Pedagogy that meets the needs of the students

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Anne Arundel Community College provides professional development for faculty in pedagogy that includes student-centered, content focused, evidenced-based effective teaching practices that improve student learning. Competency-based faculty professional development learning opportunities occur in a variety of formats including face-to-face workshops, online and hybrid courses, focused signature series programs, and department specific mini workshops. These opportunities are facilitated by internal teaching faculty and expert consultants. A menu of focused faculty development programs aligned to the priorities for the Division of Learning to include a focus on teaching effectiveness and pedagogy is provided yearly. Faculty may select from these signature programs for their required professional development plans.

Anne Arundel Community College faculty development is designed to deepen the faculty member's understanding of concepts, skills, and teaching strategies that lead to substantial learning experiences for students. Faculty content experts engage in professional development opportunities focused on understanding and applying a learner-centered approach to college teaching linking theory to practice. Structures and strategies necessary for student learning of challenging content, critical thinking, and collaboration are taught to faculty utilizing adult learning theory and incorporating active learning. Faculty are provided with formal and informal opportunities to collaborate with colleagues and learn in job-embedded contexts for discipline/course specific content instruction. Faculty are supported in expanding their instructional practices through these formal professional development opportunities and through colleague-to-colleague professional development including learning structures such as mentoring, coaching, teaching squares, book studies, and colleague to colleague observation and feedback. In addition, supervisors routinely provide opportunities for feedback and reflection.

b) The learning management system

All full and part-time faculty teaching online or hybrid courses must complete Focus on Facilitation, which provides online faculty an introduction to Canvas, an understanding of teaching online and best practices in course design, facilitation, and technology integration. Online Focus-Applied, which is currently integrated into a stimulus fund project called Resiliency Awards, provides online faculty an opportunity to build or substantially improve an online or hybrid course utilizing best practices in course design and quality standards. Separate training is also available for faculty only using the learning management system for teaching in a face-to-face mode. In all of these trainings, instruction regarding online pedagogy is both provided and modeled. An emphasis is placed on strategies that facilitate communication, develop higher order thinking and problem-solving skills, and engage learners in the online environment. Clear navigation, explicit instructions, accessibility, and format of appropriate assessments are presented and discussed. Lectures for all didactic courses are placed online through the Canvas system.

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c) Evidenced-based best practices for distance education, if distance education is offered.

Faculty content developers will work in collaboration with instructional designers to develop online courses that adhere to institutional course design best practices as informed by the essential standards for course design. Additionally, trainings, presentations, demonstrations, and model courses are available to faculty regarding evidenced-based best practices for distance education. In addition, all faculty members, both full and part-time, who will be teaching hybrid or online sections, enroll in and must pass Focus on Facilitation. Online Focus is a semester-length online course building process emphasizing educational practices and best practices in course design offered by the college's IDEA Lab.

J. Adequacy of Library Resources (as outlined in COMAR 13B.02.03.12).

- 1. Describe the library resources available and/or the measures to be taken to ensure resources are adequate to support the proposed program. If the program is to be implemented within existing institutional resources, include a supportive statement by the President for library resources to meet the program's needs.**

The college's Andrew G. Truxal Library has a collection of over 148,000 books, 150 print periodicals, 560 CDs, 2,650 DVDs and 65 online databases offering access to more than 15,000 electronic journals and magazines, 35,000 electronic books, hundreds of thousands of digital images and hours of streaming video and audio. The library provides access to the Internet for educational research purposes. All textbooks used in the proposed curriculum are available in the library for students to use. The textbooks will be available both to be checked out and in the reference section. Resources are periodically reviewed for current content and availability. Library staff were consulted during the program development phase and determined that adequate resources are available for the students in the proposed program.

K. Adequacy of Physical Facilities, Infrastructure and Instructional Equipment (as outlined in COMAR 13B.02.03.13)

- 1. Provide an assurance that physical facilities, infrastructure and instruction equipment are adequate to initiate the program, particularly as related to spaces for classrooms, staff and faculty offices, and laboratories for studies in the technologies and sciences. If the program is to be implemented within existing institutional resources, include a supportive statement by the President for adequate equipment and facilities to meet the program's needs.**

The proposed degree program will be implemented using existing institutional resources which are adequate to meet the program's needs. The program has the full support of the president and Board of Trustees. No new facilities or resources will be required.

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2. **Provide assurance and any appropriate evidence that the institution will ensure students enrolled in and faculty teaching in distance education will have adequate access to:**

- a) **An institutional electronic mailing system,**

AACC provides all students with a student college email address. In addition, there is an electronic mailing system within the Canvas learning management system. Canvas is a robust and comprehensive learning management system that features tools for group discussions as well as private email communication with the instructor and among students. Additionally, they may use any of the other Canvas features such as posting announcements and discussion boards.

- b) **A learning management system that provides the necessary technological support for distance education**

AACC has an easy-to-use learning management system, Canvas, which students can either learn on their own, virtually attend Canvas online training, or receive help from the helpdesk or instructors. The helpdesk (410-777-HELP) is available during the week and on weekends. There are also computers in the Truxal Library for student use. Canvas provides the necessary technological support that this certificate needs. All courses have a Canvas course shell in which faculty are required to post their syllabus and to use the Canvas gradebook. Additionally, they may use any of the other Canvas features such as posting announcements and discussion boards. It also features an accessible online gradebook that all instructors are required to use and update regularly. Assignments can be assessed directly in Canvas using easily accessible tools for providing and viewing instructor feedback.

L. Adequacy of Financial Resources with Documentation (as outlined in COMAR 13B.02.03.14)

1. **Complete Table 1: Resources and Narrative Rationale. Provide finance data for the first five years of program implementation. Enter figures into each cell and provide a total for each year. Also, provide a narrative rationale for each resource category. If resources have been or will be reallocated to support the proposed program, briefly discuss the sources of those funds.**

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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)	\$42,600	\$77,418	\$113,612	\$151,222	\$190,292
a. Number of F/T Students	5	10	15	20	25
b. Annual Tuition/Fee Rate	\$4,800	\$4,896	\$4,994	\$5,094	\$5,196
c. Total F/T Revenue (a x b)	\$24,000	\$48,960	\$74,909	\$101,876	\$129,892
d. Number of P/T Students	10	15	20	25	30
e. Credit Hour Rate	\$124	\$126	\$129	\$132	\$134
f. Annual Credit Hour Rate	15	15	15	15	15
g. Total P/T Revenue (d x e x f)	\$18,600	\$28,458	\$38,703	\$49,346	\$60,400
3. Grants, Contracts & Other External Sources	\$0	\$0	\$0	\$0	\$0
4. Other Sources	\$0	\$0	\$0	\$0	\$0
TOTAL (Add 1 – 4)	\$42,600	\$77,418	\$113,612	\$151,222	\$190,292

Financial Data – Resources

Reallocated Funds: None

Tuition and Fee Revenue: Tuition & Fees are estimated to increase by 2% each year.

Grants and Contracts: None

Other Sources: None

Total Year: None

2. Complete Table 2: Program Expenditures and Narrative Rationale.

TABLE 2 - EXPENDITURES					
Expenditure Categories	Year 1	Year 2	Year 3	Year 4	Year 5
1. Faculty (b+c below)	\$36,655	\$37,754	\$38,887	\$40,054	\$41,255
a. # FTE	1.00	1.00	1.00	1.00	1.00
b. Total Salary	\$34,050	\$35,072	\$36,124	\$37,207	\$38,324
c. Total Benefits	\$2,605	\$2,683	\$2,763	\$2,846	\$2,932
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	\$0	\$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)	\$36,655	\$37,754	\$38,887	\$40,054	\$41,255

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Financial Data – Expenditures

Faculty Funds: This program consists of coursework that has faculty and other instructional resources in place. As a result, there are no additional resources required to offer this program, except for the cost associated with providing additional faculty coverage in support of enrollment growth. Increased enrollment would potentially require new adjunct contracts at the current cost of \$1,135 per faculty load hour as needed. Salaries are estimated to increase by 3% each year.

Administrative Staff Funds: None

Supportive Staff Funds: None

Equipment: None

Library: None

New or Renovated Spaces: None

Other Expenses: None

M. Adequacy of Provisions for Evaluation of Program (as outlined in COMAR 13B.02.03.15).

1. Discuss procedures for evaluating courses, faculty, and student learning outcomes.

All courses and faculty at AACC are evaluated by students using the online Student Opinion Forms (SOFs) at the conclusion of each semester. These forms have standard Likert questions with opportunities for anecdotal feedback. Students are also given the opportunity to leave comments in some of the criteria and to render a summary judgment of the course and teaching faculty. All faculty are evaluated each academic year based on the college's evaluation form which includes a review of student opinion form data. Student opinion form data is also reviewed and evaluated during the faculty promotion and tenure processes. In addition to soliciting student input for faculty and course evaluation, faculty colleagues conduct classroom visitations and peer evaluations in the second and fifth year of employment and at any time of consideration for promotion or tenure for full-time faculty. Adjunct faculty are evaluated by a peer or supervisor in the first year of employment and every three years thereafter and/or at the time of consideration of promotion.

Student learning outcomes will be assessed by evaluating data collected via the Canvas Learning Platform data collection tool. Data will be collected from a number of assessment sources, including essays, exams, and quizzes. Faculty will compare global achievement levels with the current set of student learning outcomes to determine the utility and effectiveness of the learning outcomes. This procedure leaves open the possibility of future adjustment to ensure that these outcomes drive optimal classroom instruction and yield useful data.

2. Explain how the institution will evaluate the proposed program's educational effectiveness, including assessments of student learning outcomes, student retention, student and faculty satisfaction, and cost-effectiveness.

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The College has an established Office of Assessment and Instructional Innovation. The Director of Assessment and Instructional Innovation meets regularly with a faculty-run subcommittee on Learning Outcomes Assessment, a sub-committee of the Teaching and Learning Committee. The mission of the subcommittee on Learning Outcomes Assessment is to guide and oversee program-level outcomes assessment throughout the college. The Office of Assessment and Instructional Innovation provides tools to the college's various programs to assist in regular program assessment, including an Annual Program/Department Assessment Report and a Curriculum Mapping Template to ensure alignment of course objectives and outcomes with department and/or program outcomes as well as college-level core competencies.

Anne Arundel Community College's Educational Policies Committee (EPC) is designed to evaluate the addition or modification of new programs, and deletion of existing programs. EPC makes recommendations to the Academic Forum/Council of the college since it is charged with evaluating existing and proposed curricula and courses so that they support educational objectives and policies and comply with established requirements from accrediting and other approving agencies. The proposed program was reviewed and approved by EPC, the Academic Forum/Council, as well as the College's Board of Trustees.

The college conducts regular evaluations of degree programs with respect to enrollment, retention, curriculum relevancy, and outcomes assessment. All programs undergo a comprehensive review on a staggered four-year cycle, using a Comprehensive Program Review

Template that contains program data scored on a rubric. The template includes metrics in the areas of program continuation and completion, course success, headcount and program outcomes assessment. Also required is completion of a Program Review Narrative, which includes action items. The entire package is then reviewed in meetings that include the program chair/director, Assistant Dean, Director of Assessment and Instructional Innovation, Dean, Associate Vice President for Learning & Academic Affairs (AVPL), and the Provost/Vice President for Learning. The purpose of the program review meeting is to share program successes and address program needs. To ensure progress is being made on action items, the Office of the AVPL requires the Deans to complete two-year interim reports. Program review meetings and discussions also include consideration of programs costs and return on investment to address cost effectiveness and the impact on student and community needs. Each year, the program progress is evaluated in the Assessment of Outcomes and Educational Effectiveness Plan. In addition, National exam pass rates are also evaluated during this process.

Student satisfaction with courses and instruction is assessed for each course and instructor each semester through the collection of feedback through student opinion forms. Through student opinion forms, students can assess and comment on the course content, delivery, and instruction. This information is used for faculty evaluation and considerations for promotion and tenure.

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N. Consistency with the State's Minority Student Achievement Goals (as outlined in COMAR 13B.02.03.05).

- 1. Discuss how the proposed program addresses minority student access & success, and the institution's cultural diversity goals and initiatives.**

A key feature of AACC's mission and strategic planning involves respecting, valuing and achieving diversity. AACC's Diversity Statement asserts that AACC is committed to supporting and sustaining a diverse and inclusive educational environment. Diversity is not merely a goal, but a value that is embedded throughout the institution in multiple areas including, but not limited to, learning, teaching, student development, institutional functioning, and engagement in partnerships with the local and global community. In addition, the elements of the proposed program strongly align with the college's strategic plan in support of academic excellence in using "... high-quality educational practices and learning to eradicate systemic inequalities."

O. Relationship to Low Productivity Programs Identified by the Commission:

- 1. If the proposed program is directly related to an identified low productivity program, discuss how the fiscal resources (including faculty, administration, library resources and general operating expenses) may be redistributed to this program.**

Not applicable.

P. Adequacy of Distance Education Programs (as outlined in COMAR 13B.02.03.22)

- 1. Provide affirmation and any appropriate evidence that the institution is eligible to provide Distance Education.**

Anne Arundel Community College has been approved to offer one or more degree or certificate/diploma programs for which students could meet 50% or more of their requirements by taking distance education courses by Middle States Commission on Higher Education. AACC utilizes the Canvas platform to provide online lectures to students. In addition, the college has distance education classrooms equipped with cameras and audio to share lectures with students in offsite facilities.

- 2. Provide assurance and any appropriate evidence that the institution complies with the C-RAC guidelines, particularly as it relates to the proposed program.**

The Middle States Commission on Higher Education is the accrediting body for AACC. The College follows the appropriate guidelines and adheres to the national standards and integrity for its distance education programs.