



2901 Liberty Heights Ave.  
Baltimore, Maryland 21215-7893

www.bccc.edu

410-462-8300  
MD Toll-Free: 1-888-203-1261  
TTY: 1-800-735-2258

December 12, 2017

Secretary James D. Fielder, Jr.  
Maryland Higher Education Commission  
6 North Liberty Street  
Baltimore, Maryland 21201

Dear Secretary Fielder:

It is the responsibility of Baltimore Community College (BCCC) and the administration to ensure that current and prospective students are offered programs that will challenge their academic abilities to obtain gainful employment.

Please find attached Baltimore City Community College (BCCC) proposal request for approval to transition former Options to Areas of Concentration (AOC).

1. Arts and Sciences Transfer-Pure and Applied Mathematics
2. Arts and Sciences Transfer-Science
3. Business Management
4. Business Marketing
5. Fashion Retailing

Also, attached is the proposal for a new Arts and Sciences Transfer-Actuary Associate of Science degree program.

We thank you in advance for receiving our written requests. Should you require additional information please feel free to contact Dr. Daphne Snowden, Dean of Academic Operations and Service at [dsn Snowden@bccc.edu](mailto:dsn Snowden@bccc.edu) or (410) 462-7697.

Sincerely,

Tonja L. Ringgold, EdD  
Vice President for Academic Affairs/ Accreditation Liaison Officer (ALO)



## Cover Sheet for In-State Institutions

### New Program or Substantial Modification to Existing Program

|                                 |                                  |
|---------------------------------|----------------------------------|
| Institution Submitting Proposal | Baltimore City Community College |
|---------------------------------|----------------------------------|

*Each action below requires a separate proposal and cover sheet.*

- |   |   |
|---|---|
| <input checked="" type="radio"/> New Academic Program | <input type="radio"/> Substantial Change to a Degree Program            |
| <input type="radio"/> New Area of Concentration       | <input type="radio"/> Substantial Change to an Area of Concentration    |
| <input type="radio"/> New Degree Level Approval       | <input type="radio"/> Substantial Change to a Certificate Program       |
| <input type="radio"/> New Stand-Alone Certificate     | <input type="radio"/> Cooperative Degree Program                        |
| <input type="radio"/> Off Campus Program              | <input type="radio"/> Offer Program at Regional Higher Education Center |

|   |  |                 |
|---|--|-----------------|
| Payment Submitted: <input checked="" type="radio"/> Yes<br><input type="radio"/> No | Payment Type: <input type="radio"/> R*STARS<br><input type="radio"/> Check | Date Submitted: |
|---|--|-----------------|

|  |  |  |                                    |
|--|--|--|------------------------------------|
| Department Proposing Program                 | Mathematics and Engineering  |  |                                    |
| Degree Level and Degree Type                 | Associate of Science   |  |                                    |
| Title of Proposed Program                    | Arts and Science- AOC Actuarial Science  |  |                                    |
| Total Number of Credits                      | 60   |  |                                    |
| Suggested Codes                              | HEGIS: 491001  | CIP: 240101  |                                    |
| Program Modality                             | <input checked="" type="radio"/> On-campus   | <input type="radio"/> Distance Education ( <i>fully online</i> ) | <input type="radio"/> Both         |
| Program Resources                            | <input checked="" type="radio"/> Using Existing Resources                          | <input type="radio"/> Requiring New Resources                    |                                    |
| Projected Implementation Date                | <input type="radio"/> Fall   | <input checked="" type="radio"/> Spring                          | <input type="radio"/> Summer Year: |
| Provide Link to Most Recent Academic Catalog | URL: <a href="http://bccc.catalog.acalog.com/">http://bccc.catalog.acalog.com/</a> |  |                                    |

|                                     |   |  |  |
|-------------------------------------|---|--|--|
| Preferred Contact for this Proposal | Name: Dr. Daphne Snowden                        |  |  |
|                                     | Title: Dean of Academic Operations and Services |  |  |
|                                     | Phone: (410) 462-7697                           |  |  |
|                                     | Email: dsnowden@bccc.edu                        |  |  |

|                           |  |                |  |
|---------------------------|--|----------------|--|
| President/Chief Executive | Type Name: Dr. James Johnson                     |                |  |
|                           | Signature:                                       | Date: 11/29/18 |  |
|                           | Date of Approval/Endorsement by Governing Board: |                |  |

Revised 6/13/18

## **Arts and Sciences Transfer – Mathematics (Area of Concentration: Actuarial Science)**

### **A. Centrality to Institutional Mission and Planning Priorities:**

Baltimore City Community College's (BCCC) Mathematics program is an Arts and Sciences Transfer program. The proposed area of concentration, Actuarial Science, is an option in the Mathematics program designed for students desiring to transfer to a four-year college or university to earn a bachelor's degree in Actuarial Science.

This program supports BCCC's mission to provide quality, affordable, and accessible education for a diverse population. Additionally, this program will prepare students to obtain careers in bookkeeping, auditing, or accounting for professional educators and researchers, which supports the College's mission to meet the professional and personal goals of students.

Baltimore City Community College's strategic plan includes the goal of aligning, supporting and delivering courses, programs, and services to ensure progression, transferability, and employability (Goal 1.1). The curriculum for the Mathematics program includes courses that transfer to four-year universities and colleges.

The operational budget for all mathematics courses and activities are embedded within the budget for the Mathematics and Engineering department at the College. Ongoing administrative, financial, and technical support of the proposed area of concentration will also be supported by the Mathematics and Engineering department. The College administrators are committed to continue the program for a period of time sufficient to allow enrolled students to complete the program.

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

Increasing the number of Science, Technology, Engineering, and Mathematics (STEM) degrees awarded to students is a national goal as well as one of the key goals for Maryland postsecondary education. The AS in Mathematics is a STEM degree that will address this goal.

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

Actuaries analyze the financial costs of risk and uncertainty. They use mathematics, statistics, and financial theory to assess the risk of potential events, and they help businesses and clients develop policies that minimize the cost of that risk. Actuaries' work is essential to the insurance industry. Most actuaries work for insurance companies. Although most work full time in an office setting, some actuaries who work as consultants may travel to meet with clients. Actuaries need a bachelor's degree and must pass a series of exams to become certified professionals. They must have a strong background in mathematics, statistics, and business.

According to the Bureau of Labor Statistics, employment of actuaries is projected to grow 22 percent from 2016 to 2026; the growth will result in about 5,300 new jobs over the 10-year period.

Actuaries need a bachelor's degree, typically in mathematics, actuarial science, statistics, or some other analytical field. Students must complete coursework in economics, applied statistics, and corporate finance, and must pass a series of exams to become certified professionals. (See Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook*, Actuaries, at <https://www.bls.gov/ooh/math/actuaries.htm>).

In fall 2016, the BCCC Office of Institutional Research reported 80% for retention or graduation for the Arts and Sciences – Mathematics program. The percentage of graduated or retained students is highest among all transfer programs at the College.

**D. Reasonableness of Program Duplication:**

Currently, Howard Community College is the only community college with a similar degree. Howard Community College offers an Actuarial Science – A.A. Transfer Degree. Howard Community College is 16 miles from Baltimore City.

Students with some postsecondary education can have a career in bookkeeping, accounting, or auditing. An associate's degree in Actuarial Science will give students the foundation needed to pursue a career in one of these fields.

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

This program will not impact the implementation or maintenance of high-demand programs at HBI's.

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

This program will not impact the uniqueness and institutional identity and mission of HBIs.

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

Faculty develop assessment protocol to assess student learning outcomes for all courses in the program based upon a five-year matrix plan. Student learning outcome data is then analyzed and detailed learning improvement plans are created for courses that do not meet the benchmark criteria. The student learning outcomes for this program are listed below.

| Student Learning Outcomes  |  |
|--|--|
| Program Goal:  | Measurable Learning Outcomes   |
| 1. Provide students with a strong foundation in Mathematics.   | A. Students will be able to find the derivative of a function.   |
|  | B. Students will be able to evaluate definite and indefinite integrals.  |
|  | C. Students will be able to differentiate and integrate multi-variate functions.   |
|  | Students will be able to solve first- and second-order differential equations.   |
| 2. Provide students with a strong foundation in Logic.   | A. Students will be able to solve combinatorial problems by using the concepts of mathematics logic.   |
|  | B. Students will be able to construct algorithms by using the concepts of mathematical logic.  |
|  | C. Students will be able to make decisions using critical thinking, logic, and problem-solving skills.   |
| 3. Provide students with a strong foundation in Physics.   | A. Students will be able to use Newton's Laws to analyze an object being acted upon by a system of forces.   |
|  | B. Students will be able to solve electricity and magnetism problems.  |
| 4. Provide students with a strong foundation in analytic and computer-based problem-solving skills.                              | A. Students will be able to design and code a computer program in C and C++ languages.   |
|  | B. Students will be able to write C and C++ programs that involve looping.   |
|  | C. Students will be able to describe the characteristics of object-oriented design.  |
| 5. Provide students with a rigorous introduction to abstract mathematics.  | A. Students will be able to find the matrix representation of basic transformations of functions such as reflections and rotations.                |
|  | B. Students will be able to find orthonormal bases of vector spaces using the Gram-Schmidt process.  |
|  | C. Students will be able to find the matrix representation of a linear transformation of one vector space into another, and vice-versa.            |
| 6. Provide students with a strong foundation in quantitative reasoning and real world applications of these reasoning processes. | A. Students will be able to analyze and evaluate information from a mathematical perspective to develop reasoned solutions to real world problems. |
|  | B. Gain competence in mathematical literacy and reasoning along with critical thinking skills necessary for making informed judgments.             |

The Actuary concentration has the following requirements (total of 60 credits):

- Program Courses (25 credits)
- General Education Courses (32 credits)
- College Electives (3 credits)

| Course ID | Program Course (25 credits)           | Credits |
|-----------|---------------------------------------|---------|
| MAT 141   | Calculus II                           | 4       |
| ACCT 221  | Principles of Financial Accounting I  | 3       |
| ACCT 222  | Principles of Financial Accounting II | 3       |
| MAT 210   | Advanced Calculus                     | 4       |
| MAT 211   | Differential Equations                | 4       |
| MAT 212   | Linear Algebra                        | 4       |
| CSC 108   | Programming in C                      | 3       |

| Course ID      | General Education Course (32 credits)                 | Credits |
|----------------|---|---------|
| ENG 101        | English Writing                                       | 3       |
| MAT 140        | Calculus I  | 4       |
| PHI 104        | Logic and Critical Thinking                           | 3       |
| SP 101         | Fundamentals of Speech Communication                  | 3       |
| ECO 201        | The American Economy: Macroeconomic Theory            | 3       |
| ENG 200        | Introduction to Literature                            | 3       |
| H 101 or H 151 | History of American Civilization I or World History I | 3       |
| PHY 203        | General Physics I                                     | 5       |
| PHY 204        | General Physics II                                    | 5       |

| Course ID | College Requirement (3 credits)      | Credits |
|-----------|--------------------------------------|---------|
| PRE 100   | Preparation for Academic Achievement | 1       |
| HLF       | Health & Life Fitness Elective       | 2       |

### Course Descriptions:

#### **PRE 100: Preparation for Academic Achievement**

All new, degree- or certificate-seeking students and students entering with fewer than 15 credits are required to complete the College's Orientation course. The purpose of this course is to provide information necessary for academic success in college and to give students knowledge of what to expect in their classes. Students learn strategies that empower them to achieve success.

#### **ENG 101: English Writing**

This course offers classroom instruction and practice in the skills necessary to write effective informative and persuasive essays, to understand the primary principles of scholarly inquiry and research, and to use the conventions of documentation. Students learn to use the conventions of standard written American English to establish a clear purpose in their writing, to develop their purpose with adequate and pertinent evidence, and to adapt their presentations to a range of audiences. The preparation of regularly scheduled essays is required, as is revision and editing of instructor-evaluated work.

#### **MAT 140: Calculus I**

Differential calculus is covered with an introduction to antidifferentiation and the definite integral. Topics include limits, continuity, the derivative, implicit differentiation, differentials, curve sketching, inverse functions, logarithmic and exponential functions, and laws of growth and decay. Prerequisite: MAT 129 or appropriate ACCUPLACER score

#### **MAT 141: Calculus II**

This course focuses on integral calculus. Topics include applications of the definite integral (volumes, work, length of arc, centroids), techniques of integration, inverse trigonometric functions and hyperbolic functions, mean value theorem of integration, improper integrals, and infinite series. Prerequisite: MAT 140 or appropriate ACCUPLACER score

#### **MAT 210: Advanced Calculus**

This course focuses on advanced concepts in calculus. Topics include vectors in three dimensions, partial differentiation, unconstrained and constrained optimization, multiple integration, and vector field theory. MAT 211: Differential Equations (4 credits) 60 lecture hours Prerequisite: MAT 141 Differential equations are introduced. Topics include first order

differential equations, linear differential equations, applications of linear differential equations, the Laplace Transform, and systems of differential equations. Prerequisite: MAT 141

**MAT 211: Differential Equations**

Differential equations are introduced. Topics include first order differential equations, linear differential equations, applications of linear differential equations, the Laplace Transform, and systems of differential equations. MAT 212: Linear Algebra (4 credits) 60 lecture hours  
Prerequisite: MAT 141 The theory and applications of linear algebra are introduced. Topics include linear systems, matrices, determinants, vector spaces, orthogonality, eigenvalues and eigenvectors, and linear transformations. Prerequisite: MAT 141

**MAT 212: Linear Algebra**

The theory and applications of linear algebra are introduced. Topics include linear systems, matrices, determinants, vector spaces, orthogonality, eigenvalues and eigenvectors, and linear transformations. Prerequisite: MAT 141

**PHI 104: Logic and Critical Thinking**

Students are introduced to the principles of reasoning and reflective thinking. Argumentation, analysis, inductive and deductive reasoning, fallacies, and logical techniques are explored. The course also examines classical reasoning as well as how critical reasoning may be applied to gender, race, ethnicity, and class. Prerequisites: ENG 82 or RENG 92 or appropriate course waivers or ACCUPLACER scores

**SP 101: Fundamentals of Speech Communication**

Human communication in both a theoretical and an experiential framework is investigated. Areas of study include communication theory, interviewing, and informative and persuasive speaking. Students prepare and present informative and persuasive speeches based on classic models. Theory, preparation, appropriate form, and delivery are studied and evaluated. Each student is responsible for at least one formal interview and three speeches. Several impromptu speeches may be included. Prerequisites: ENG 82 or RENG 92 or appropriate course waivers or ACCUPLACER scores

**CSC 108: Programming in C**

This course is a dual offering with CISS 108. Step-by-step explanations of how to write, compile, and execute C programs and how to write applications on the computer are provided. Emphasis is on the portability of the language and systematic development of programs. Prerequisites: ENG 82 (for ESL: ELI 82W) or RENG 92; MAT 125 or MAT 128; CISS 116; CSC 105 Lab fee Passing this course with a “C” or better fulfills the College’s Computer Literacy Requirement.

**ECO 201: The American Economy I: Macroeconomic Theory**

Students are helped to understand the overall functioning of the American economy through an examination of unemployment, inflation, recession, GNP, and the interaction of businesses, households, and government. Prerequisites: ENG 82 or RENG 92 or appropriate course waivers or ACCUPLACER scores



**ENG 200: Introduction to Literature**

The four literary forms—poetry, drama, the short story, and the novel—are studied. Major emphasis is on teaching students to read critically and to write critical essays based on the analysis of various literary works. Prerequisite: ENG 101

**ACCT 221: Principles of Financial Accounting I**

Accounting is the language of business. Financial Accounting Principles and concepts define methodologies for accurately recording business transactions and presenting them in financial statements that explain the economic conditions of a business as a basis of decision making by both external stakeholders, including owners and creditors, and by managers within the organization. Prerequisite: MAT 81 or MAT 91 or satisfactory ACCUPLACER score

**ACCT 222: Principles of Financial Accounting II**

Managerial Accounting is the analytical use of Financial Accounting Information. Covered in Principles of Accounting I, to make decisions to maximize the short and long term profitability and stability of an organization. This course provides comprehensive coverage of tools for making management decisions and the organizational structures that support them. Prerequisite: ACCT 221 (formerly ACCT 201 and ACCT 211)

**H 101: History of American Civilization I**

The settlement of America and its people, from the Age of Exploration, to the conclusion of the Civil War, is surveyed. Major political, economic, and social trends are included in the survey. Prerequisites: ENG 82 or RENG 92 or appropriate course waivers or ACCUPLACER scores

**OR****H 151: World History I**

World culture from prehistoric times, through the Renaissance, is surveyed. Prerequisites: ENG 82 or RENG 92 or appropriate course waivers or ACCUPLACER scores

**PHY 203: General Physics I**

This calculus-based physics course is intended for students majoring in mathematics, the natural sciences, computer science, or engineering. While the course doesn't assume any prior knowledge of physics, knowledge of calculus is essential. PHY 203 is the first course in a two-semester general physics sequence and covers mechanics, fluid mechanics, waves, and sound. Prerequisite: MAT 140 Corequisite: MAT 141 Lab fee

**PHY 204: General Physics II**

The course is intended for students majoring in the natural sciences, mathematics, and engineering and computer science. PHY 204 covers heat, thermodynamics, electricity, magnetism, and optics. Prerequisites: MAT 141; PHY 203 Lab fee PHY 204 continues PHY 203.

**HEALTH AND LIFE FITNESS:** 2 course electives

There are no specialized accreditation or graduate certification requirements for this program and its students.

There is no contract with another institution or non-collegiate organization.

### H. Adequacy of Articulation

Baltimore City Community College and Morgan State University have agreed to offer an articulated program leading to the award of a Bachelor of Science in Actuarial Science. The articulation agreement is attached to this document.

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

| Faculty Member   | Credentials  | Status        | Courses Taught  |
|--|--|---------------|---|
| Jeffrey Grell,<br>Assistant Professor of<br>Mathematics                                | M.S.E. Johns Hopkins<br>University,<br>Science Engineering                     | Full-<br>time | MAT 141 Calculus II<br>MAT 210 Advanced<br>Calculus<br>MAT 211 Differential<br>Equations<br>MAT 212 Linear<br>Algebra |
| Michael Kaye,<br>Associate Professor of<br>Mathematics and<br>Engineering              | M.S., Carnegie Mellon<br>University,<br>Electrical and Computer<br>Engineering | Full-<br>time | MAT 141 Calculus II<br>MAT 211 Differential<br>Equations<br>MAT 211 Differential<br>Equations                         |
| Sofya Kerzhner,<br>Assistant Professor of<br>Mathematics                               | M.S., Ural State University,<br>Mechanics                                      | Full-<br>time | MAT 141 Calculus II   |
| Nataliya Reznichenko,<br>Associate Professor of<br>Mathematics                         | Ed.D. Morgan State<br>University,<br>Mathematics Education                     | Full-<br>time | MAT 141 Calculus II<br>MAT 210 Advanced<br>Calculus<br>MAT 211 Differential<br>Equations                              |
| Brian Lazurus,<br>Associate Professor of<br>Accounting                                 | M.B.A., University of<br>Baltimore.<br>International Business                  | Full-<br>time | ACCT 221 Principles<br>of Financial<br>Accounting I<br>ACCT 222 Principles<br>of Financial<br>Accounting II           |
| Dariush Kochesfahani,<br>Associate Professor of<br>Mathematics and Computer<br>Science | M.S., University of<br>Baltimore, Management<br>Information Systems            | Full-<br>time | CSC 108 Programming<br>in C   |

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

The BCCC Library is the center for information resources at the College. Assisted by a dedicated staff, students may explore resources in diverse formats, including books, print and electronic periodicals, reference tools, and indexes. Audiovisual materials such as videotapes, CDs and DVDs are also available. Current holdings include 75,000 volumes with 150 periodical titles in print format. However, most magazines, journals, and newspapers are available in digital form, known as e-journals. Students have access to a catalog of print materials as well as digital access to 25 databases containing articles from 12,500 e-journals.

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

The mathematics department is housed in the Life Sciences Building. The building has classrooms, twelve scientific laboratories, five computer laboratories, two lecture halls and three conference rooms. The building contains sixty-five offices, with fifty-one of these dedicated to full- and part-time faculty.

The building is wired for telecommunications capabilities, and there are 293 network connections. There are two tiered distance learning lecture halls, one of which is fully equipped with video cameras, projectors, screens, and desktop microphones. The building also has six "smart" classrooms and a centralized, state-of-the-art video distribution system.

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

The finance data for the first five years of program implementation is shown below in Table 1.

| <b>TABLE 1: RESOURCES</b>               |               |               |               |               |               |
|---|---------------|---------------|---------------|---------------|---------------|
| <b>Resource Categories</b>              | <b>Year 1</b> | <b>Year 2</b> | <b>Year 3</b> | <b>Year 4</b> | <b>Year 5</b> |
| 1. Reallocated Funds                    | \$0           | \$0           | \$0           | \$0           | \$0           |
| 2. Tuition/Fee Revenue<br>(c + g below) | \$9,060       | \$14,888      | \$23,948      | \$35,604      | \$51,128      |
| a. Number of F/T Students               | 3             | 5             | 8             | 12            | 17            |
| b. Annual Tuition/Fee Rate              | \$2,596       | \$2,596       | \$2,596       | \$2,596       | \$2,596       |
| c. Total F/T Revenue (a x b)            | \$7,788       | \$12,980      | \$20,768      | \$31,152      | \$44,132      |
| d. Number of P/T Students               | 2             | 3             | 5             | 7             | 11            |
| e. Credit Hour Rate                     | \$106         | \$106         | \$106         | \$106         | \$106         |

|   |         |          |         |         |         |
|---|---------|----------|---------|---------|---------|
| f. Annual Credit Hour                         | 6       | 6        | 6       | 6       | 6       |
| g. Total P/T Revenue<br>(d x e x f)           | \$1,272 | \$1,908  | \$3,180 | \$4,452 | \$6,996 |
| 3. Grants, Contracts & Other External Sources | \$0     | \$0      | \$0     | \$0     | \$0     |
| 4. Other Sources                              | \$0     | \$0      | \$0     | \$0     | \$0     |
| TOTAL (Add 1 – 4)                             | \$9,060 | \$14,888 | 23,948  | 35,604  | 51,128  |

This program will be implemented with existing faculty resources and administrative staff, so there are no new expenditures for this program.

### Maryland Higher Education Commission

Please do not leave any cells blank. Place a “O” in the cell if no data is applicable for the Specific expenditure category.

| <b>TABLE 2: PROGRAM EXPENDITURES:</b> |               |               |               |               |               |
|---------------------------------------|---------------|---------------|---------------|---------------|---------------|
| <b>Expenditure Categories</b>         | <b>Year 1</b> | <b>Year 2</b> | <b>Year 3</b> | <b>Year 4</b> | <b>Year 5</b> |
| 1. Faculty (b + c below)              | \$0.00        | \$0.00        | \$0.00        | \$0.00        | \$0.00        |
| a. Number of FTE                      | \$0.00        | \$0.00        | \$0.00        | \$0.00        | \$0.00        |
| b. Total Salary                       | \$0.00        | \$0.00        | \$0.00        | \$0.00        | \$0.00        |
| c. Total Benefits                     | \$0.00        | \$0.00        | \$0.00        | \$0.00        | \$0.00        |
| 2. Admin Staff (b + c) below)         | \$0.00        | \$0.00        | \$0.00        | \$0.00        | \$0.00        |
| a. Number of FTE                      | \$0.00        | \$0.00        | \$0.00        | \$0.00        | \$0.00        |
| b. Total Salary                       | \$0.00        | \$0.00        | \$0.00        | \$0.00        | \$0.00        |
| c. Total Benefits                     | \$0.00        | \$0.00        | \$0.00        | \$0.00        | \$0.00        |
| 3. Support Staff (b +c below)         | \$0.00        | \$0.00        | \$0.00        | \$0.00        | \$0.00        |
| d. Number of FTE                      | \$0.00        | \$0.00        | \$0.00        | \$0.00        | \$0.00        |
| e. Total Salary                       | \$0.00        | \$0.00        | \$0.00        | \$0.00        | \$0.00        |
| f. Total Benefits                     | \$0.00        | \$0.00        | \$0.00        | \$0.00        | \$0.00        |

|                                    |        |        |        |        |        |
|------------------------------------|--------|--------|--------|--------|--------|
| 4. Technical Support and Equipment | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.00 |
| 5. Library                         | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.00 |
| 6. New or Renovated Space          | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.00 |
| 7. Other Expenses                  | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.00 |
| TOTAL (Add 1 – 7)                  | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.00 |

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

Faculty are evaluated by students in their courses each semester. The course evaluation surveys are administered by Evaluation KIT, an online course evaluation and survey system. Evaluation KIT is integrated in Canvas, which is the learning management system used at Baltimore City Community College.

The Faculty Senate of BCCC have delegated the Program Review and Evaluate Committee to perform an internal review of all programs at the college. The Program Review Procedure are used to identify steps necessary to ensure programs meet standards for relevance, viability, cost effectiveness, and adherence to Code of Maryland (COMAR) and Middle States Commission on Higher Education (MSCHE) requirements and support College and program goals (retention, graduation, student learning outcomes, etc.).

Course assessment is the basis of program assessment and is completed on a five-year rotation as scheduled and planned on a five-year schedule. Each semester faculty implement course assessments and submit results data to the program coordinator. The program coordinator will then work with faculty members to develop an action plan for course outcomes that were not met.

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

One of the core values of Baltimore City Community College is diversity. The College recognizes, accepts, appreciates, and supports individual differences and lifestyles.

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

The proposed program is not directly related to an identified low productivity program.

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

The proposed program is not a distance education program. However, Baltimore City Community College offers several degrees and certificates that can be completed online or in a combination of traditional and online courses.

# ARTICULATION AGREEMENT


**Baltimore City Community College**  
Associate and Sciences Transfer  
Mathematics (Area of Concentration)  
and  
**Morgan State University**  
Bachelor of Science Degree  
Actuarial Science


Entered into this 30<sup>th</sup> day of May 2017


Approved by:

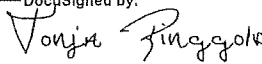
## Morgan State University

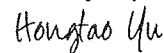
## Baltimore City Community College

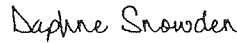
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Dr. David Wilson  
President

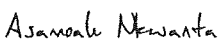
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Dr. Gordon F. May  
President/CEO

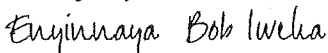
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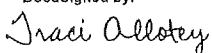
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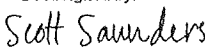
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Dr. Hongtao Yu  
Dean, School of Computer, Mathematical and  
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Dr. Asamoah Nkwanta  
Chair, Mathematics

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Dr. Enyinnaya Iweha  
Dean, Science

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Dr. Traci Allotey  
Director, Actuarial Science

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Prof. Scott Saunders  
Associate Dean, Mathematics

This agreement is effective with new Morgan admits beginning in the fall 2017

This agreement will remain in effect until fall 2019

## ARTICULATION AGREEMENT

Baltimore City Community College, an agency of the state of Maryland (hereafter referred to as BCCC), and Morgan State University (hereafter referred to as MSU), a public state university in Baltimore, Maryland, agree to offer an articulated program leading to the award of a Bachelor of Science in Actuarial Science.

### PURPOSE OF AGREEMENT

This agreement is entered into in the interests of our students. The general purpose of this agreement is to make clear the terms of this articulation agreement. This agreement will allow for the efficient transfer of students between campuses, including transfer credit, admissions and financial aid/scholarship. It will provide opportunities for students beyond the classroom, serving as a basis for student involvement and faculty interaction. It will set expectations for administrators, faculty, and staff at both institutions, and foster a working relationship between the parties. Finally, it will encourage students to continue their education for their personal and professional development.

### ADMINISTRATIVE PRINCIPLES

**The following general principles guide the operation of this Agreement:**

1. The program is designed for graduates/transfers of the Arts and Sciences Transfer Mathematics (Area of Concentration). A maximum of seventy (70) credit hours from BCCC or another community college will be allowed towards fulfillment of the minimum one hundred and twenty (120) credits required for baccalaureate completion.
2. In accordance with Code of Maryland Regulations, all courses meeting general education requirements at BCCC will transfer to MSU as general education. Other general education requirements will be met by using required or elective courses at MSU as noted in this agreement.
3. The maximum number of credits that will be accepted by MSU toward degree requirements from non-direct classroom instruction (including CLEP, AP, International Baccalaureate, and other select nationally-recognized standardized examination scores, and other four-year institutions) is ninety (90) credits. If the course is evaluated by BCCC and applied to the Associate of Applied Science transfer degree, the student must submit the score report to be evaluated by MSU and credit will be applied as determined by an MSU evaluation. It is possible that not all transferable credit accepted by MSU will be applicable to the degree.
4. Courses completed at another community college or four-year institution will count toward the total credits transferred into MSU. Official transcripts from all previously attended institutions will also be required.



5. Once the Arts and Sciences Transfer Mathematics (Area of Concentration) degree is completed and the student has been admitted to MSU, the student will be instructed to contact the appointed academic advisor before registering for classes.
6. While BCCC and MSU do not presently have a dual admissions program, should one be agreed to, this agreement will not preclude students from participation and students may apply for and receive the benefits of dual-admission.
7. Students may complete the MSU curriculum part-time or full-time, online or face-to-face, or in any combination thereof.
8. This articulation agreement becomes effective on the date set forth on the first page of this document. This agreement will be reviewed and re-signed every two (2) years.
9. BCCC will provide potential student directory information, as defined in the Family Education Rights and Privacy Act (FERPA), to MSU for matters of recruitment, marketing and data management. Educational records maintained by each institution are subject to FERPA and the regulations promulgated under it.
10. BCCC will permit MSU to conduct on-campus information sessions at locations and on dates that are mutually agreeable.
11. BCCC and MSU agree to monitor the performance of this agreement and to revise it as necessary.
12. The agreement may be terminated by either party after adequate written notice, defined as one calendar year, at which time appropriate measures will be put into place regarding the continued transfer of students.
13. The office of record for program articulation agreements at Morgan State University is the Transfer Center. The office of record at Baltimore City Community College is the Office of Academic Operations and Services.

**For students following this agreement, the requirements listed below apply:**

1. Students must maintain a 2.0 cumulative grade point average in order to transfer to MSU. Should students choose to transfer prior to completion of the associate's degree, they will be responsible for meeting MSU eligibility requirements.
2. Morgan State University does not guarantee the transferability of courses taken outside the guidelines within this articulated agreement.
3. In order to be eligible for admission, students must comply with all MSU admissions requirements, including posted deadlines and submission of appropriate documentation.
4. Should this articulation agreement concern a program with additional admissions requirements or prerequisite coursework, students must have met all standards prior to enrollment at MSU.
5. Students shall apply for admission to Morgan State University, indicating Actuarial Science as the intended major. Applications for admission can be obtained by contacting: the Office of Admission and Recruitment at (443) 885-3000 or [http://www.morgan.edu/Admissions/Undergraduate\\_Admissions/Transfer\\_Applicants.html](http://www.morgan.edu/Admissions/Undergraduate_Admissions/Transfer_Applicants.html). All required application materials must be supplied by the deadline.
6. Students will automatically be nominated for scholarships for which they are eligible. \*For priority scholarship consideration, students must complete their admission application by November 15<sup>th</sup> for fall admission.
7. Students shall contact the Transfer Coordinator for their major for an advisement appointment once they have been admitted to MSU. The required credit hours must be successfully completed before Morgan State University can grant the degree. Each student's last thirty (30) credit hours must be completed at MSU.
8. Students completing an Arts and Sciences Transfer degree and applying to Morgan State University for the Actuarial Science will be considered for the Transfer Incentive Program (TIP). [http://www.morgan.edu/admissions/undergraduate\\_admissions/how\\_to\\_apply/transfer\\_applicants/transfer\\_incentive\\_program.html](http://www.morgan.edu/admissions/undergraduate_admissions/how_to_apply/transfer_applicants/transfer_incentive_program.html)

## APPENDICES

As part of this agreement, the following have been included:

1. Course-by-course articulations, including satisfaction of general education requirements at both Baltimore City Community College and Morgan State University.
2. Upper division requirements to be completed at Morgan State University.
3. An academic advising sheet showing requirements for completion of the degree at BCCC.

These appendices may be changed, by mutual agreement, after adequate notice, defined as one calendar year, without the procedural process review or revision of the entire articulation agreement.

## APPENDIX I-A: COURSE ARTICULATIONS

**Baltimore City Community College**  
**Arts and Sciences Transfer Degree**  
**Area of Concentration (Mathematics)**  
**and**  
**Morgan State University**  
**Bachelor of Science Degree**  
**Actuarial Science**

**Course by Course Equivalency**  
**(MSU Catalog 2016-2018 - BCCC Catalog 2016-2017)**

The following pages indicate the course-to-course equivalency, including General Education, as agreed within the articulation agreements.

| BCCC Course  | Credits   | MSU Equivalent            | BCCC Notes | MSU Notes                         |
|--|-----------|---------------------------|------------|-----------------------------------|
| PRE 100  | 1         | Elective                  |            |                                   |
| ENG 101  | 3         | ENGL 101                  |            | Satisfies EC category             |
| HLF Elective   | 1         | PHEC XXX                  |            | Must be physical activity         |
| MAT 140  | 4         | MATH 241                  |            |                                   |
| PHI 104  | 3         | PHIL 109 (CT)             |            | Satisfies CT Category             |
| SP 101   | 3         | SPCH 101(AH)              |            | Satisfies AH Category             |
| CSC 108  | 3         | INSS 141 (IM)             |            | Satisfies IM Category             |
| ECO 201  | 3         | ECON 211 (SB)             |            | Satisfies SB category             |
| ENG 200  | 3         | Elective (AH)             |            | Satisfies AH Category             |
| MAT 141  | 4         | MATH 242                  |            |                                   |
| MAT 107  | 3         | MATH 205                  |            |                                   |
| MAT 219  | 3         | Elective                  |            |                                   |
| H 101 or H 151   | 3         | HIST 105 or HIST 101 (SB) |            | Satisfies SB Category             |
| MAT 210  | 4         | MATH 243                  |            |                                   |
| PHY 203  | 5         | PHYS 205 (BP)             |            |                                   |
| HLF Elective   | 1         | Free Elective             |            |                                   |
| MAT 211  | 4         | MATH 340                  |            |                                   |
| MAT 212  | 4         | MATH 312                  |            |                                   |
| *PHY 204   | 5         | PHYS 206 (BP)             |            | Satisfies BP Category<br>BIOL 101 |
| <b>Total</b>   | <b>60</b> |                           |            |                                   |
| *Courses that are defined as general education by one institution shall transfer as general education even if the receiving institution does not have that specific course or has not designated that course as general education (MHEC Student Transfer Policy) |           |                           |            |                                   |

## APPENDIX II-A: UPPER DIVISION REQUIREMENTS

### Morgan State University

(Catalog 2016-2018)

#### Actuarial Science

All transfer students will be required to take a minimum of 30 credits of upper division coursework at MSU. A minimum total of 120 credits are required for the degree. Completion of the Actuarial Science degree program at MSU requires students to successfully complete the following course work:

| Actuarial Science & General Education Requirements   |                                    |              |                         |
|--|------------------------------------|--------------|-------------------------|
| Course Number  | Course Title                       | Credit Hours | Explanation             |
| <b>First Semester Course Recommendations</b>   |                                    |              |                         |
| ASCS 130   | Intro to Actuarial Science         | 3            |                         |
| *ACSC 305  | ACSC Prof Dev Adv I                | 0            |                         |
| ENGL 102   | Freshman Composition II (EC)       | 3            | Gen Ed Requirement (EC) |
| ACCT 201   | Principles of Accounting           | 3            |                         |
| MATH 431   | Math Theory of Stats I             | 3            |                         |
| MATH 331   | Applied Probability and Statistics | 3            |                         |
| ECON 212   | Principles of Economics II         | 3            |                         |
| <b>Total Credits</b>   |                                    | 18           |                         |
| <b>Second Semester Recommendations:</b>  |                                    |              |                         |
| ACCT 202   | Principles of Accounting II        | 3            |                         |
| MATH 337   | Non Para Stat Methods I            | 3            |                         |
| ACSC 346   | Financial Mathematics              | 4            |                         |
| FIN 343  | Managerial Finance                 | 3            |                         |
| *ACSC 306  | ACSC Prof Dev Adv II               | 0            |                         |
| MATH 432   | Math Theory of Stats II            | 3            |                         |
| <b>Total Credits</b>   |                                    | 16           |                         |
| <b>Third Semester Recommendations:</b>   |                                    |              |                         |
| MATH 333   | App Reg & Time Analysis            | 3            |                         |
| ACSC 405   | ACSC Prof Dev Senior I             | 1            |                         |
| HIST 350 (CT)  | Intro to African Diaspora          | 3            | Gen Ed Requirement (CT) |
| BUAD 361   | Fund of Risk Management            | 3            |                         |
| ^XXX   | Complementary Studies              | 3            | BUAD 202                |
| MATH 363   | ACT & Stochastic Model I           | 3            |                         |
| XXX HH   | Health and Healthful Living        | 3            | Gen Ed Requirement (HH) |
| <b>Total Credits</b>   |                                    | 19+          |                         |
| <b>Fourth Semester Recommendations:</b>  |                                    |              |                         |
| ^XXX   | Complementary Studies              | 3            | BUAD 381                |
| MATH 433   | Prob Solving Tech & Apps           | 2            |                         |
| BUAD 362   | Life & Health Insurance            | 3            |                         |
| FIN 344  | Security Analysis                  | 3            |                         |
| MATH 450/490   | Senior Sem/ ACSC Research          | 3            |                         |
| MATH 364   | ACT & Stochastics Model II         | 3            |                         |
| ACSC 406   | ACSC Prof Dev Senior II            | 1            |                         |
| <b>Total Credits</b>   |                                    | 18           |                         |
| <p>All students, including transfer students, are required to pass all Proficiency and Senior Level Comprehensive Departmental Examinations to be eligible for graduation.</p> <p>^To satisfy the Complementary Studies for the Actuarial Science Degree, it is strongly recommended that students complete BUAD 202 Business Leadership Seminar and BUAD 381 Legal and Ethical Business</p> <p>*ACSC 305 and ACSC 306 are pass / fail courses for the Actuarial Science Program. All student must register and earn a grade of "P" in these course to earn the degree in this program. Transfer students must enroll in the Actuarial Science Professional Development course that is commensurate with their academic classification, as pertains to the Actuarial Science curriculum, at the time of transfer into the program. Students are strongly encouraged to meet with their Actuarial Science Academic Advisor to determine the appropriate course level.</p> <p>+Third Semester Recommendations: The regular class load limit for students in good standing is 18 credits except for students majoring in Engineering where the regular class load limit is 19 credits. Authorization for loads in excess of 18 credits must be secured from the Dean of the school or college in which a student is enrolled. The class load limit for students on probation is 13 credits. Students requesting to carry excess credits must secure a "Request for Excess Credit" form from the office of their respective dean and submit it to the Office of Records and Registration during the registration period.</p> |                                    |              |                         |
| <b>Total credits to be taken at MSU</b>  |                                    | 71           | (131 total credits)     |

**APPENDIX III-A: ACADEMIC ADVISING SHEET**  
**Baltimore City Community College**  
**(Catalog Year 2016-2017)**

Thank you for your interest in the articulated academic plan for the School of Computer, Mathematical and Natural Science. Successful completion of this program will ensure a smooth transition to Morgan State University's Bachelors of Science degree in Actuarial Science.

| <b>Courses to take at Baltimore City Community College:</b> |   |               |                  |                       |                       |
|---|---|---------------|------------------|-----------------------|-----------------------|
| <b>Course</b>   | <b>Course Title</b>                                   | <b>Credit</b> | <b>Completed</b> | <b>Grade Received</b> | <b>Grade Required</b> |
| PRE 100   | Preparation for Academic Achievement                  | 1             |                  |                       | D or better           |
| ENG 101   | English Writing                                       | 3             |                  |                       | C or better           |
| HLF Elective  | Health and Life Fitness                               | 1             |                  |                       | D or better           |
| MAT 140   | Calculus  | 4             |                  |                       | C or better           |
| PHI 104   | Logic and Critical Thinking                           | 3             |                  |                       | D or better           |
| SP 101  | Fundamentals of Speech Communication                  | 3             |                  |                       | C or better           |
| CSC 108   | Programming in C                                      | 3             |                  |                       | C or better           |
| ECO 201   | The American Economy I                                | 3             |                  |                       | C or better           |
| ENG 200   | Introduction to Literature                            | 3             |                  |                       | D or better           |
| MAT 141   | Calculus II   | 4             |                  |                       | C or better           |
| MAT 219   | Discrete Mathematics                                  | 3             |                  |                       | C or better           |
| H 101 or H 151  | History of American Civilization I or World History I | 3             |                  |                       | D or better           |
| MAT 210   | Advanced Calculus                                     | 4             |                  |                       | C or better           |
| PHY 203   | General Physics I                                     | 5             |                  |                       | C or better           |
| HLF Elective  | Health and Life Fitness                               | 1             |                  |                       | D or better           |
| MAT 211   | Differential Equations                                | 4             |                  |                       | C or better           |
| MAT 212   | Linear Algebra  | 4             |                  |                       | C or better           |
| PHY 204   | General Physics II                                    | 5             |                  |                       | C or better           |
| <b>Total</b>  |   | <b>60</b>     |                  |                       |                       |

**Application Deadlines:**

Fall Semester: November 15<sup>th</sup> priority  
 Spring Semester: January 10<sup>th</sup>

**Application fee:**  
 \$35 Fee

**To be admitted you will need to have the following credits and grade point average (GPA) requirements:**

- 0-11 credits, a 2.0 GPA and meet high school requirements
- 12-23 credits, a 2.0 GPA and meet SAT requirements
- 24 or more credits, a 2.0 GPA

**For more information:**

Contact Office of Admission and Recruitment at 443-885-300 or visit online at <http://www.morgan.edu>.