UNIVERSITY SYSTEM
of **MARYLAND**

**Board of Regents
Committee on Education Policy and Student Life**

**Friday, March 5, 2021
9:30 a.m.**

**Zoom Details to be Provided to Committee
Public Listen-Only Access: 1-443-353-0686; Conference ID: 495 047 344**

<u>Public Session Agenda</u>

<u>Action Items</u>

1. Academic Program Actions ~ New Academic Program Proposals
   a. University of Maryland, Baltimore: MS in Diversity, Equity and Inclusion Leadership
   b. University of Maryland, College Park: Master of Extension Education Program
   c. University of Maryland Global Campus: BS in Cloud Computing Systems
   d. University of Maryland Global Campus: BS in Data Science

<u>Information Items</u>

2. Post-Approval Academic Program Review Reports and Forthcoming Reviews
3. New Programs 5-Year Enrollment Reviews, Fall 2016 – Fall 2020
4. William E. Kirwan Center for Academic Innovation Update
5. P-20 Update

<u>Action Item</u>

6. Adjourn

UNIVERSITY SYSTEM
of **MARYLAND**

BOARD OF REGENTS
SUMMARY OF ITEM FOR ACTION,
INFORMATION, OR DISCUSSION

TOPIC: University of Maryland, Baltimore:
Master of Science in Diversity, Equity and Inclusion Leadership Program

COMMITTEE: Education Policy and Student Life

DATE OF COMMITTEE MEETING: Friday, March 5, 2021

SUMMARY: The University of Maryland, Baltimore Graduate School is proposing to offer a Master of Science in Diversity, Equity and Inclusion Leadership (MS-DEIL). The program will be an extension of the School's existing Post-Baccalaureate Certificate in Intercultural Leadership. The MS-DEIL will consist of 11 courses with a total of 31 credits. The instruction will primarily occur online, including both synchronous and asynchronous learning, and will include a required in-person component. The in-person requirement is currently designed as two consecutive days of face-to-face lectures, trainings, discussions, and presentations at UMB's campus in Baltimore, MD. Upon successful completion of the program, students will be prepared to serve in leadership roles across disciplines that marshal agency, organizational, and/or institutional efforts to create and maintain environments that go further than supporting the needs of individuals of diverse identities, but center belongingness and the critical examination of policies and practices that disproportionately impact individuals and groups based on their group membership.

ALTERNATIVE(S): The Regents may not approve the program or may request further information.

FISCAL IMPACT: No additional funds are required. The programs can be supported by the projected tuition and fees revenue.

CHANCELLOR'S RECOMMENDATION: That the Education Policy and Student Life Committee recommend that the Board of Regents approve the proposal from the University of Maryland, Baltimore to offer the Master of Science in Diversity, Equity and Inclusion Leadership Program.

COMMITTEE RECOMMENDATION:	DATE: March 5, 2021
BOARD ACTION:	DATE:
SUBMITTED BY: Joann A. Boughman	301-445-1992 jboughman@usmd.edu

DR. ROGER J. WARD, JD, MSL, MPA
Interim Provost and Executive Vice President

Academic Affairs/Graduate School
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Baltimore, MD 21201
410 706 2477
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February 1, 2021

Jay A. Perman, MD
Chancellor
University System of Maryland
3300 Metzerott Road
Adelphi, MD 20783

Dear Chancellor Perman:

The University of Maryland Graduate School is seeking authorization to offer a Master of Science in Diversity, Equity and Inclusion Leadership program. This 31-credit, online program, an extension of the School's existing Post-Baccalaureate Certificate in Intercultural Leadership, will be integrated within the proposed Master's degree program.

Thank you for your time and consideration of the Graduate School's request. Please contact me if you need additional information.

Regards,

Dr. Roger J. Ward, JD, MSL, MPA
Interim Provost and Executive Vice President
Dean, Graduate School

UNIVERSITY SYSTEM OF MARYLAND INSTITUTION PROPOSAL FOR

X   New Instructional Program

_____   Substantial Expansion/Major Modification

_____   Cooperative Degree Program

_____   Within Existing Resources, or

X   Requiring New Resources

University of Maryland, Baltimore
Institution Submitting Proposal

Master of Science in Diversity, Equity and Inclusion Leadership
Title of Proposed Program

Master of Science (M.S.)	**Fall 2022**
Award to be Offered	Projected Implementation Date
220100	**302301 1**
Proposed HEGIS Code	Proposed CIP Code

University of Maryland Graduate School	**Dr. Flavius Lilly** **Vice Dean**
Department in which program will be located	Department Contact

410-706-7767	**flilly@umaryland.edu**
Contact Phone Number	Contact E-Mail Address

Signature

February 1, 2021

Dr. Roger J. Ward, JD, MSL, MPA   Date
Interim Provost and Executive Vice President
Dean, Graduate School

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A PROPOSAL FOR A NEW ACADEMIC PROGRAM at THE UNIVERSITY OF MARYLAND, BALTIMORE FOR A MASTER OF SCIENCE IN DIVERSITY, EQUITY, AND INCLUSION LEADERSHIP

TABLE OF CONTENTS

A. Centrality to Institutional Mission and Planning Priorities

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

   The Master of Science in Diversity, Equity and Inclusion Leadership (MS-DEIL) supports the University of Maryland, Baltimore's mission: "To improve the human condition and serve the public good of Maryland and society-at-large through education, research, clinical care, and service" by providing learners with the tools necessary to serve in leadership roles that marshal agency, organizational, and/or institutional efforts to create and maintain environments that go further than supporting the needs of individuals of diverse identities, but center belongingness and the critical examination of policies and practices that disproportionately impact individuals and groups based on their group membership. Diversity, equity, and inclusion practitioners are vital in supporting organizations as they work to optimize and/or re-imagine organizational culture to meet diversity, equity, and inclusion goals. It is through this work that the MS-DEIL seeks to equip learners to improve the human condition and support UMB's vision to "be a beacon to the world as an environment for learning and discovery that is rich in diversity and inclusion."

   The MS-DEIL will consist of 11 courses with a total of 31 credits. The instruction will primarily occur online and will include both synchronous and asynchronous learning. While asynchronous activities will concentrate on lectures, readings, discussions, and critical reflection, etc., the synchronous activities will consist of real-time discussions, small group work, role-playing exercises, and mock facilitation essential to building the capacity to serve as a diversity, equity, and inclusive practitioner. The one-credit Intercultural Impact Institute is currently designed as a two-day in-person institute consisting of face-to-face lectures, trainings, discussions, and presentations at UMB's campus in Baltimore, MD.

   Students will examine critical theories and frameworks that will guide their practice and practical application. The MS-DEIL will explore race, ethnicity, gender, and culture in the U.S. context, leadership, executive writing, statistics and evaluation, evidence-based practices, and the role of laws and policies. Intercultural and inclusive learning competencies will be addressed as a thread through the curriculum. The MS-DEIL builds from the success of the PBC in Intercultural Leadership which launched in fall of 2018. With this in mind, the Intercultural Leadership PBC will be integrated into the MS-DEIL. Upon completion of the MS-DEIL, students will also receive the Intercultural Leadership PBC credential.

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

   The proposed degree supports UMB's strategic goals through the fulfillment of the following strategic themes:

   - **Student Success** challenges academic units to "design contemporary teaching and learning environments that are accessible and affordable to prepare students to be exemplary professionals and leaders in society" (University of Maryland, Baltimore, n.d.). The degree is

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designed for completion by aspiring and current diversity, equity, and inclusion practitioners in roughly 2.5 years, and its online format increases its accessibility to both traditional and post-traditional students. The university has recognized the vital role the Graduate School plays in creating accessible education for individuals already engaged in their professions.

- **Inclusive Excellence** encourages the campus to "foster an environment that recognizes and values each member of the UMB community, enabling members to function at their highest potential to achieve their personal and professional goals" (University of Maryland, Baltimore, n.d.). This degree provides aspiring and current practitioners with the skills needed to lead and assess institutional efforts of diversity, equity, and inclusion.

- **Efficiency, Effectiveness, and Assessment** aims to incentivize efficiency, effectiveness, and evaluation to make more responsible and impactful use of UMB's resources. This program will utilize existing offerings in the Graduate School and leverage the expertise of existing faculty members to meet several of the required and elective courses.

Last, the MS in Diversity, Equity and Inclusion Leadership directly aligns with UMB's commitment to anti-racism and the existing statement of cultural competency that professes that "the University will develop policies and engage in education, scholarship, and service delivery that promote and support cultural knowledge, skills, and attitudes. Together as a university community we commit to self-assessing and strengthening our own cultural competence by creating a climate that celebrates diversity and inclusion" (University of Maryland, Baltimore,
n.d.).

Provide a brief narrative of how the proposed program will be adequately funded for at least the first five years of program implementation.

The proposed program is well-resourced; there is already existing faculty and coursework to support 6 of the 11 proposed courses in the MS-DEIL. Due to shared coursework with the existing Intercultural Leadership PBC and the MS/PhD in HPE, the UMB Graduate School has the capacity to offer the proposed degree program through a combination of existing resources and new funding to support the program into the foreseeable future.

Provide a description of the institution's commitment to ongoing administrative, financial, and technical support of the proposed program and continuation of the program for a period sufficient to allow enrolled students to complete the program.

The UMB Graduate School has an ongoing commitment to sustaining new degree programs it has developed. The Graduate School has committed significant resources in the realm of administrative support including a senior associate dean, assistant dean, and program director who will provide leadership for the quality and sustainability of the MS-DEIL. Additionally, the Graduate School plans sufficiently to ensure the financial viability of all new degree programs including the provision of faculty instruction and advisement at a level to ensure a high touch learning experience for students. The Graduate School has also invested in technical assistance through our centralized Center for Information Technology Services and the Faculty Center for Teaching and Learning, which both assist our faculty and students in their success as teachers and learners, respectively. If for some unforeseeable reason the

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Graduate School discontinues the MS-DEIL, then we are committed to a teach-out plan for all enrolled students, so they may complete the program and earn their degree.

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

Alignment with the Maryland State Plan

There is a critical and compelling regional and statewide need for training that directly contributes to academic preparation of aspiring and current practitioners who will work to create and uphold diverse, inclusive, equitable, and affirming work and educational environments. The Maryland State Plan for Postsecondary Education outlines several goals for institutions of higher education. The MS-DEIL addresses the following areas:

Goal 1: Success: This program is designed to prepare aspiring and current practitioners to practitioners with the skills needed to lead and assess institutional efforts of diversity, equity, and inclusion.

Goal 2: Access, Affordability, and Completion: The MS-DEIL is an online degree designed to be completed within two-and-a-half years. This design and academic commitment will encourage program completion resulting in academically prepared diversity, equity, and inclusion practitioners. The degree will appeal to current students, graduates, and faculty of UMB academic programs, as well as current practitioners working in related fields and aspiring practitioners.

Goal 3: Innovation: At the time that this proposal is being authored, only two master's programs were identified nationally that focus on preparing aspiring and current practitioners for careers in leading institutional/organizational diversity, equity, and inclusion efforts. This program will serve as the first of its kind in the State of Maryland and will contribute to the limited national academic programs for educating and training diversity, equity, and inclusion aspiring and current practitioners for the transformational leadership roles that they will undertake upon completion of this program.

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

In response to growing internal demands from their employees and external pressure from the public, companies are increasingly committing themselves to diversity and inclusion (DEI) initiatives by hiring DEI professionals. A study from Glassdoor Economic Research (Zhao, 2019) found that between 2018 to 2019, DEI job postings on Glassdoor jumped 30% in the United States to a total of 810 open positions. This job growth continued in 2020 until the economic impact of COVID-19 resulted in a 60% decline of DEI-related job openings between the months of March and June. The murder of George Floyd sparked passionate calls for racial justice across the country. Many companies responded to these calls by hiring DEI professionals, resulting in a 55% rebound in job openings. Most of these new DEI-related openings are for senior-level positions, such as Director for Diversity and Inclusion and Chief Diversity Officer, which demonstrates employer's commitment to elevating DEI efforts to senior leadership and their interest in hiring experienced professionals to lead and manage DEI

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efforts. Comparing data from CNBC Make It, Linked In, and Glassdoor, the salary for a Diversity and Inclusion Manager can range from $88,400 to $97,300, while the salary for a Chief Diversity Officer can reach into the six figures, with an average of $126,000.

In terms of geographical concentration of DEI job growth, the Glassdoor study (2019) found that Washington, D.C. had the largest number of diversity and inclusion job openings in the country, later followed by the city of Baltimore, which was placed tenth on its list. The most openings for DEI-related roles were in the public services sector and at large companies with 1,000 or more employees. 25% of DEI-related openings were in education while 8% were in healthcare and hospitals and 6% in the government. As companies create more DEI-related positions, job seekers have also been expressing more interest in DEI roles. The number of searches for diversity and inclusion jobs increased by 35% between 2018 and 2019.

Diversity and inclusion positions exceed overall recovery during aftermath of George Floyd's death

Job openings on Glassdoor, indexed to 100 on March 2

Total openings   Human resources   Diversity and inclusion

Source: Glassdoor   THE WASHINGTON POST
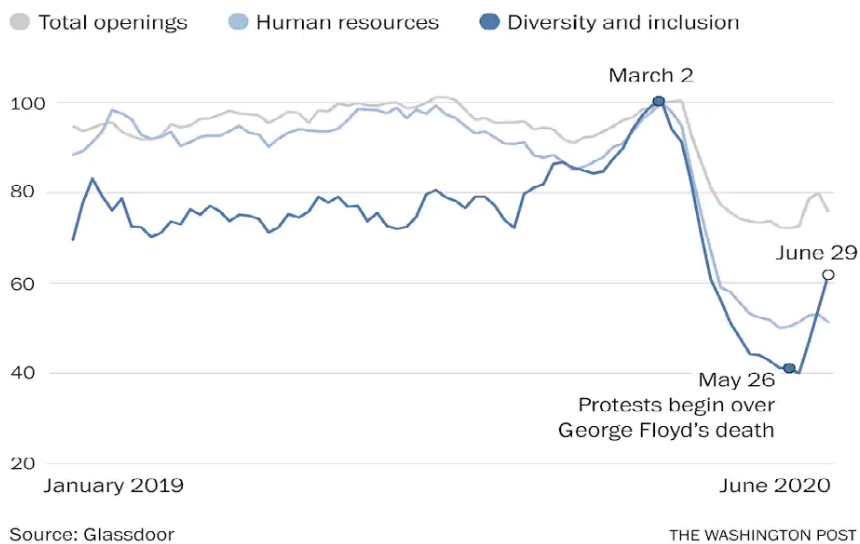
The Master of Science in Diversity, Equity and Inclusion Leadership will educate current and aspiring DEI leaders at public, private, and government institutions. The curriculum is designed to meet the needs of individuals with backgrounds in healthcare, science, social work, law, community engagement, education, and public safety. With this in mind, the faculty identified to teach in this program hold degrees in various fields and occupy diversity, equity, and inclusion roles in higher education, K-12 education, public safety, and health care. The academic program will target both in-state and out-of-state adult learners from a variety of academic disciplines to support an interdisciplinary approach for all enrolled learners. Additionally, students will select an area of focus for their capstone experience to further align the academic program with their unique career goals. The careful selection of a capstone project will aid in preparing students to hold and excel in diversity, equity, and inclusion roles in their respective fields.

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Table 1 Job Vacancies by Level

Experience Level	Vacancies
Entry Level	4,219
Mid-Level	5,697
Executive Level	2,435
Unspecified	2,309
Total	14,660

D. Reasonableness of Program Duplication

Master's Degrees in DEIL Offered in the Region

There are no current master's programs in the region that prepare aspiring and current practitioners to engage in Diversity, Equity and Inclusion Leadership positions. A total of five diversity and inclusion master's programs were identified nationally. Tufts University, University of Kansas, Rowan University, Widener University, and University of Dubuque offer master's programs focused on educating organizational leaders in diversity, equity, and inclusion. Additionally, both Tufts University and Rowan University offer similar programs at the graduate certificate level. Similarly, Northwestern University, Boston College, University of Kentucky, and Minnesota State University – Mankato offer graduate certificates. University of Nevada, Las Vegas and University of Michigan offer a related graduate certificate to students enrolled in their graduate programs only. Last, there are several universities across the nation, such as University of Utah, University of South Carolina, and Georgetown University, that offer executive certificates (not graduate certificates) focused on various aspects of diversity in leadership.

The proposed MS-DEIL in the only program in the State of Maryland that prepares students to lead institutional diversity, equity, and inclusion efforts. A total of 92 leadership- or equity-focused programs were identified through the MHEC academic program inventory searchable website. Of these programs, three are tangentially related to the proposed MS-DEIL program. The Culturally Responsive Teacher Leadership Master of Education at Bowie State University; Equity and Excellence in Education PBC at McDaniel College; the Master of Arts in Leadership in Teaching: Culturally Proficient Leadership at Notre Dame of Maryland University all equip K-12 teachers and/or administrators to utilize intercultural competence in addressing civic, social, environmental and economic issues within education. Additionally, the PBC at McDaniel College is also advertised for educators interested in K-12 diversity, equity, and inclusion leadership roles. McDaniel College's PBC directly addresses inequities in educational access, curriculum, and pedagogy and positions graduates to "examine the foundations of becoming a culturally

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responsive social justice educator and gain skills needed to be change agents in public schools that are working to create more equitable learning environments for students of diverse backgrounds" (McDaniel College, n.d.). Unlike the aforementioned academic programs designed specifically for K-12 educators, the MS-DEIL is specifically being created to equip current and aspiring diversity, equity, and inclusion practitioners for the transformational leadership roles that they will undertake in organizations across disciplines.

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

The proposed MS-DEIL does not have relevance to the uniqueness and/or institutional identities and missions of HBIs. Currently, there are no academic programs offered through Bowie State University, Coppin State University, Morgan State University, and the University of Maryland Eastern Shore that resemble the proposed MS-DEIL. While Bowie does offer a Culturally Responsive Teacher Leadership Master of Education, it is not geared toward the same student population. Based on the current offerings of the Maryland HBIs, we do not expect any impact on the implementation or maintenance of high-demand programs at HBIs.

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

HBIs do have a unique history and identity of educating Black/African American students. HBIs are dedicated to educating graduates who can interact with other racial and ethnic groups upon graduation. Predominately White institutions also must educate students to interact with diverse individuals upon graduation. With this in mind, we do not believe that offering this program impacts the mission and identity of HBIs.

G. Adequacy of Curriculum Design, Program Modality, and Related Learning Outcomes

1. **Describe how the proposed program was established, and also describe the faculty who will oversee the program.**
   The MS-DEIL was proposed by the UMB faculty and approved by the faculty shared-governance body, the Graduate Council, in recognition of the compelling need for academically trained diversity, equity, and inclusion practitioners to respond to the increase in DEI positions nationally. The program will be supervised by Courtney J. Jones Carney, MBA, Executive Director of the Intercultural Leadership & Engagement Center in the UMB Division of Student Affairs and Program Director and faculty in the Intercultural Leadership PBC offered through the Graduate School. Additionally, this program will include both existing and newly created courses, thus utilizing the expertise of existing and newly hired faculty. The MS-DEIL will adopt UMB's Graduate School academic, administrative, and financial structure recently added for the growing number of online degree and certificate programs.

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

By the completion of the proposed MS-DEIL and consistent with the adapted National Association for Diversity Officers in Higher Education (NADOHE) standards of practice, students will be able to:

1. Conceptualize the diversity mission of an organization through a broad and inclusive definition of diversity;
2. Articulate in verbal and written form, the importance of equity, inclusion, and diversity;
3. Understand the contexts, cultures, and politics within organizations that impact the implementation and management of effective diversity change efforts;
4. Articulate in verbal and written form, the range of evidence for the benefits that through diversity, inclusion, and equity;
5. Develop innovative ways to utilize professional development efforts to advance the diversity mission of organizations;
6. Develop innovative ways to utilize organizational programming that enhances the diversity mission of organizations;
7. Demonstrate procedural knowledge for responding to bias incidents when they occur;
8. Identify how various forms of organizational data can be used to benchmark and promote accountability for the diversity mission of organizations;
9. Apply climate research in the development and advancement of a positive and inclusive climate for diversity;
10. Analyze current and historical knowledge related to issues of nondiscrimination, access, and equity; and;
11. Demonstrate awareness and understanding of the various laws, regulations, and policies related to equity and diversity.

UMB is committed to providing the best teaching and learning possible and excellence in all of its courses. Every effort is made to ensure that coherence, cohesiveness, and academic rigor between programs offered in traditional instructional formats and those offered online are equivalent. Courses are designed to result in learning outcomes appropriate to the rigor and breadth of the course and all courses assess student achievement of defined learning outcomes through regular and formal assessment planning.

The learning outcomes for each course are the foundation of the course; the learning activities, assessments, and content of the course are in alignment with the outcomes and provide a clear pathway for mastery of the outcomes.

3. Explain how the institution will provide for assessment of student achievement of learning outcomes in the program and document student achievement of learning outcomes in the program.

Faculty will assess student achievement and mastery of learning outcomes in their courses using a variety of assessments including meaningful and substantive contributions to online course discussions, satisfactory completion of assignments and reflections, scores on quizzes and examinations, scores on team collaboration, scores on written essays and term papers,

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and evaluation of research and capstone project contribution to the field of Diversity, Equity, and Inclusion.

Students will also evaluate courses and faculty through a standard evaluation of every course. Formal assessment planning is already in place throughout UMB Schools including the Graduate School. Our approach includes ensuring that student learning is in alignment with course learning outcomes, alignment of mission at institutional and program levels, alignment of mission with learning outcomes, then program outcomes with curriculum, flowing down to course outcomes and assignments. Assessment activities emphasize analysis of results and feedback loops for continuous improvement. Additional evaluation includes tracking of student retention, grade distributions, and cost-effectiveness, and regular academic program reviews consider these factors.

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

   Students must complete 31 credits which includes the Intercultural Leadership PBC. The goal of this 13-credit, four course PBC is to help students build upon their existing competencies by exploring attitudes and perceptions of self and others and applying this knowledge to practical situations. Completion of this program will increase understanding of intercultural competence and supply the necessary tools to engage in the practical application of strategies to positively influence the climate for diversity, equity, and inclusion within organizations and agencies.

   Once success is experienced in the MS-DEIL and as the Graduate School continues to grow its PBCs, the Intercultural Leadership PBC may be proposed as a concentration instead of part of the core requirements. This would allow for greater program customizations to meet the unique interests of students.

   The MS-DEIL utilizes some courses currently offered in the Graduate School. These courses are marked with an asterisk.

Course Title (credits)	Current GS Course	New Course
HPE 615: Introduction to Statistics (3 credits)*	X	
MLL 625: Intercultural and Cross-Cultural Communication (3 credits)*	X	
Historical Exploration of Culture in the U.S. (3 credits)*	X	
Historical Exploration of Race in the U.S. (3 credits)*	X	
Practical Application of Intercultural Leadership (3 credits)*	X	
INCL 643: Intercultural Impact Institute (1 credit)*	X	
DEIL 710: Employment Discrimination Law & Policy Framework (3 credits)		X
DEIL 720: Critical Appraisal of Diversity, Equity, and Inclusion Literature (3 credits)		X
DEIL 740: Strategic Executive Writing (3 credits)		X
DEIL 790: DEI Evidence-Based Leadership Toolkit (3 credits)		X

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DEIL 798: Capstone for Diversity, Equity and Inclusion Leadership (3 credits)		X

- **HPE 615: Introduction to Statistics** (3 credits)*
  This course will present basic statistical concepts and the use of advanced statistical analyses including an in-depth exposure to multiple regression and its assumptions, logistic regression, factor analysis, discriminant function analysis and time series analysis. The course will emphasize the use of these methods and the interpretation of results using social sciences applications.

- **MLL 625: Intercultural and Cross-Cultural Communication** (3 credits)*
  The purpose of this course is to study communication within the context of the cultural setting. The three main goals are: to provide students with materials, both cognitive and experiential, with which they can develop an awareness of their own cultural identity; to increase their knowledge of the special communication problems to be expected in a cross-cultural situation; and to offer students the opportunity to apply new insights to cross-cultural encounters.

- **INCL 632: Historical Exploration of Race in the U.S.** (3 credits)*
  Historical Exploration of Race in the U.S. aims to critically introduce the multiple histories and experiences of racial and ethnic groups that have been exposed to on-going marginalization in the United States of America. Through the assigned readings and exercises, students will explore the histories and formative experiences of various racial and ethnic groups in the context of the U.S. Additionally, special attention will be paid to how racial and ethnic groups have been formed; who gets to decide group membership; and how conceptions of racial and ethnic group identity have shifted over time. Through a series of modules designed to increase understanding of historically marginalized racial and ethnic groups, this course will encourage students to explore identity formation as it relates to race, ethnicity, citizenship, community building, immigration, and migration in U.S. historical and contemporary times.

- **Historical Exploration of Culture in the U.S.** (3 credits)*
  Historical Exploration of Culture in the U.S. aims to critically introduce the multiple histories and experiences of cultural groups that have been exposed to on-going marginalization in the United States of America. Building on the foundations of the previous two classes and through the assigned readings and exercises, students will explore the histories and formative experiences of cultural groups in the context of the U.S. Special attention will be paid to the impact of social movements, advocacy, and allyship, while providing practical skills for self- care. Students will focus on applying terminology commonly associated with the study of intersectionality, culture, race, ethnicity, and identity; using the intersectionality theory of oppression to an impact analysis of historical events and policies in the U.S.; producing formal and informal written forms of advocacy; evaluating the impact of policies and historical events, identifying areas of inequity, opportunity, and reconciliation; comparing, contrasting, and applying various forms of allyship and self-care; analyzing the institutionalization of

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various forms of oppression; and compiling resources related to public policy and historical experiences related to culture and historically marginalized communities.

- **Practical Application of Intercultural Leadership** (3 credits)*
Practical Applications of Intercultural Leadership aims to provide opportunities to demonstrate leadership in diverse and inclusive workplaces. Through the assigned readings and activities, students will learn and practice applying concepts of intercultural development to various aspects of their personal and professional life. Through a series of modules, students will also gain tools to continue learning and developing their intercultural skills throughout their lifetime.

- **INCL 643: Intercultural Impact Institute** (1 credit)*
The Intercultural Leadership Institute is an opportunity for students to engage in face-to-face intercultural learning and develop a deeper understanding of the concepts and skills learned over the four online courses. The Intercultural Impact Institute will provide the reflection and intergroup dialogue that is integral to intercultural development. Students will focus on the examination of environmental factors and practices to determine how they produce inequities and promote success for one group identity compared to another/others; engage in intergroup dialogue around the topics of culture, race, ethnicity, and identity; apply concepts of intercultural communication to personal and professional scenarios; identify and apply acquired knowledge and skills of culture, race, ethnicity, identity and difference to professional practice; compile resources needed to engage in the process of life-long learning in intercultural competence; and present their culminating project - an organizational assessment of a professional organization.

- **DEIL 710: Employment Discrimination Law & Policy Framework** (3 credits)
This course examines basic terminology and concepts related to diversity, equity, and inclusion through the exploration of US laws such as Title VII of the Civil Rights Act of 1963, the Age Discrimination in Employment Act of 1967, the Americans with Disabilities Act of 1990, and similar laws and legal protections for certain classes of individuals. This course will help current and aspiring diversity, equity, and inclusion practitioners to establish a structured framework for systematic analysis of employee issues that may have legal implications.

- **DEIL 720: Critical Appraisal of Diversity, Equity, and Inclusion Literature** (3 credits) This course provides in-depth discussion and relevance of diversity, equity, and inclusion literature. An emphasis will be placed on critical analysis of research articles. Independent thought and critical thinking skills will be addressed. Assigned readings will offer students the opportunity to examine prevailing research in diversity, equity, and inclusion.

- **DEIL 740: Strategic Executive Writing** (3 credits)
Strategic Executive Writing is an advanced, interdisciplinary writing course for current

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and aspiring professionals. The course explicitly focuses on discourses, genres, and writing practices employed in diversity, equity, and inclusion (DEI) work within institutions and beyond. Instruction examines existing literature on DEI writing and unpacks strategies for identifying, acclimating to, and interrogating (with the possibility of resisting and transforming) these discourses and practices to prepare practitioners for engaging contemporary audiences and stakeholders in DEI topics and issues.

- **DEIL 790: DEI Evidence-Based Leadership Toolkit** (3 credits)
  This course will provide an overview of a collection of evidence-based resources, tools, and services that practitioners can apply to their Diversity, Equity and Inclusion Leadership.

- **DEIL 798: Capstone for Diversity, Equity and Inclusion Leadership** (3 credits)
  The capstone course is a method of summative evaluation in which students demonstrate integrated knowledge of diversity, equity, and inclusion by applying their learning from their academic career in a comprehensive manner.

Master's Program Standards

Students must meet all master's program requirements for satisfactory academic performance and progress as well as UMBGS requirements. Students are advised to be familiar with all handbooks, requirements, and standards of their master's program.

UMB will be responsible for the administrative needs of all students enrolled in the MS in Diversity, Equity and Inclusion Leadership in accordance with UMB policies and procedures: ensuring that all course offerings, are entered in the UMB student registration system; ensuring that all MS-DEIL course offerings appear correctly on student transcripts and student records; and ensuring payment of tuition at the applicable per-credit tuition rate. Accordingly, students enrolled in the MS-DEIL shall pay tuition and fees; receive grades and academic credit; and shall be subject to the rules, policies, practices, and regulations
(pertinent to students) of UMB when enrolled in any of UMB's courses. The appropriate faculty have been identified, and additional guest lectures will be identified at a later time.

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

   Not Applicable.

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

   There are no specialized accreditation or graduate certification requirements for the proposed MS-DEIL.

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

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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.**
   The Graduate School maintains up-to-date information of its degree programs on the program explorer web site (https://www.graduate.umaryland.edu/Program-Explorer/). The web site has information on the curriculum, course descriptions, degree requirements, and cost of education. The website has links to information about the learning management system, support services, and financial aid. We affirm that the same information will be available for prospective and existing students in the proposed MS-DEIL.

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.**
   The Graduate School at UMB affirms that all advertising, recruiting and admissions materials will accurately represent the MS-DEIL, as do all materials produced by UMB's Graduate School for programs it offers.

H.   **Adequacy of Articulation**
        Not applicable.

I.   **Adequacy of Faculty Resources**

1. **Provide a brief narrative demonstrating the quality of program faculty. Include a summary list of faculty with appointment type, <u>terminal degree title and field</u>, academic title/rank, status (full-time, part-time, adjunct) and the course(s) each faulty member will teach in the proposed program.**

   UMB is committed to providing the best teaching and learning possible and excellence in all of its courses. Every effort is made to ensure that coherence, cohesiveness, and academic rigor between programs offered in traditional instructional formats and those offered on-line are equivalent. Courses are designed to result in learning outcomes appropriate to the rigor and breadth of the course and all courses assess student achievement of defined learning outcomes through regular and formal assessment planning.

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The learning outcomes for each course are the foundation of the course; the learning activities, assessments and content of the course are in alignment with the outcomes and provide a clear pathway for mastery of the outcomes.

The following table summarizes information about the faculty who will be responsible for designing and instructing coursework. The MS-DEIL will primarily utilize faculty resources committed to teach and in the MS/PhD in Health Professions Education and the Intercultural Leadership PBC. Courses that are already offered in the Graduate School are marked with an asterisk. Additionally, four courses will be developed to complete the program curriculum.

Name	Terminal Degree and Discipline	Rank and FT/PT Status	Course
Shani Fleming	MSHS, MPH, PA-C	Assistant Professor, Full-time	INCL 640: Practical Application of Intercultural Leadership* INCL 643: Intercultural Impact Institute (co-taught)* DEIL 720: Critical Appraisal of Diversity, Equity, and Inclusion Literature
Irina Golubeva	PhD	Associate Professor (UMBC), Full-time	MLL 625: Intercultural and Cross-Cultural Communication* INCL 643: Intercultural Impact Institute (co-taught)*
Courtney J. Jones Carney	MBA	Program Director, Adjunct Professor, Part-time	INCL 632: Historical Exploration of Race in the U.S.* INCL 643: Intercultural Impact Institute (co-taught)* DEIL 798: Capstone for Diversity, Equity and Inclusion Leadership
Patricia Alvarez	PhD, MS	Adjunct Professor	DEIL 790: DEI Evidence-Based Leadership Toolkit
William Joyner	JD, MSW	Adjunct Professor	DEIL 710: Employment Discrimination Law & Policy Framework

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Hyun-Jin Jun	PhD, Social Work	Assistant Professor, Full-time	HPE 615: Introduction to Statistics*
Ebony Nicholson	MSW	Adjunct Professor, Part-time	INCL 633: Historical Exploration of Culture in the U.S.* INCL 643: Intercultural Impact Institute (co-taught)*
James Wright	MS	Associate Faculty, Part-time	DEIL 740: Strategic Executive Writing

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

UMB, through its Faculty Center for Teaching and Learning (FCTL), has a robust process for training faculty and ensuring effective instruction. Based on Quality Matters standards, at UMB we have developed a rubric that outlines best practices for distance education - this rubric helps faculty and instructional designers develop the courses, assess the readiness of the course and ensure that the online courses are instructionally and pedagogically sound. The best practices are grounded in research, a proven synthesis of strategies, activities, design techniques, and organizational items that have proven successful in higher education. The specific domains of this checklist are as follows:

- Course overview and introduction to the students
- Course organization and design
- Learning Objectives (competencies)
- Instructional Materials
- Learner Communication, Interaction and Collaboration
- Assessment and Evaluation (measurement)
- Course Technology
- Learner Support

The Learning Management Platform UMB utilizes and provides IT support for is the Blackboard Learning Management System for online course delivery. Within Blackboard, is the Collaborate conferencing software that we will use for our synchronous live activities, i.e., orientation, face-to-face class sessions, and recurring webinars. Additionally, the FCTL team has available to them the use of a video recorder to record lectures, webcams, and an interactive smart board. We will also use video and Camtasia software for screen lecture capture.

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J. Adequacy of Library Resources

The University of Maryland, Baltimore's Health Sciences and Humans Services Library (HS/HSL) collection contain more than 30,000 electronic journals, 162 current print journals, approximately 170,000 books, and 6,000 electronic books. Students can access the electronic resources offered on the library website by logging in with their University ID number. The library serves as the regional medical library for ten southeastern states as part of the National Library of Medicines National Network of Libraries of Medicine. In addition to the library services and collections, the building also houses computing services. Faculty librarians are dedicated to providing direct service to students. They use subject expertise to develop online resources and provide in-person consultations.

The HS/HSL is one of the largest health sciences libraries in the United States with a track-record of user-centered innovative services and programs. The library consists of 57 employees including 27 faculty librarians. The attractive and vibrant facility, which opened in 1998, serves as a hub for collaboration and learning with resources, programs, and tools that promote discovery, creativity, and innovation. With wireless connectivity throughout the building, the HS/HSL has 45 group study rooms, three computer classrooms, an Innovation Space which includes 3D printers; a presentation and practice studio, art gallery, and multiple technology-enhanced meeting spaces. Through the HS/HSL's website (www.hshsl.umaryland.edu,) the UMB community has access to a full range of resources and services.

The HS/HSL supports the University's students, faculty, and staff members in the schools of dentistry, law, medicine, nursing, pharmacy, and social work; the Graduate School; the University of Maryland Medical Center; and other affiliated institutions. Research Connection, the library's suite of research services, is available for all programs on campus and includes individual research consultations, a systematic review service, research impact assessment, reference assistance, and more. For over 30 years, the HS/HSL has provided liaison services, in which faculty librarians are assigned to work with specific user communities. Faculty librarians have many years of instructional experience in the classroom, in the community, and the online environment. In FY16, faculty librarians reached 4,131 faculty, staff and students through online and in-person instructional sessions offered through the curriculum and in library-sponsored workshops.

In FY16, the HS/HSL licensed 116 databases, 4,524 journals, 18,018 e-books, and maintained a print collection of 360,104 volumes. One hundred percent of the current journal subscriptions are available electronically. Through its interlibrary loan and document delivery service, library staff can acquire articles and other resources not available through the library's collections. These are secured through local, regional, and national networks including the University System of Maryland and Affiliated Institutions, the National Library of Medicine's DOCLINE service, and OCLC, among others.

The HS/HSL is also home to the National Network of Libraries of Medicine/Southeastern Atlantic Region (NNLM/SEA), whose mission is to advance the progress of medicine and improve the public health by providing all U.S. health professionals with equal access to biomedical information and improve the public's access to information to enable them to make informed decisions about their health. With only eight regions in the U.S. designated as regional medical libraries under contract to the National Library of Medicine at the National Institutes of Health, the Southeastern/Atlantic Region serves ten southeastern states, Puerto Rico, the U.S. Virgin

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Islands, and the District of Columbia. The HS/HSL has held this competitive and prestigious designation for over 30 years.

K. Adequacy of Physical Facilities, Infrastructure and Instructional Equipment

UMB's 71-acre research and technology complex encompasses 67 buildings in West Baltimore near the Inner Harbor. The faculty has offices provided within their respective departments, and the Graduate School has identified office space to house the program director and instructional technology personnel. UMB has adequate facilities, infrastructure, and equipment to support any distance learning needs of the MS-DEIL Program. Students will have full access to the computing facilities at UMB. Students will be provided with UMB e-mail and library accounts and will have complete journal searching ability via PubMed. UMB possesses computing facilities that include a networked computing environment for support of a broad range of information technology functions, including basic research, clinical research, patient information, and general office management.

L. Adequacy of Financial Resources with Documentation

No new general funds will be required for implementation of the proposed MS-DEIL. The degree will be coordinated and administered fully through the Graduate School including identifying a program director who is directly affiliated with the Graduate School. Tuition will be administered through the Graduate School, and student tuition payment is in addition to that required of any individual professional school at UMB. As shown in the Budget Table provided in Appendix B this program is expected to be self-supported.

M. Adequacy of Provisions for Evaluation of Program

Students will have the opportunity to evaluate courses and faculty through a standard evaluation of every course. Formal assessment planning is already in place throughout UMB Schools, including the Graduate School. Our approach includes ensuring that student learning is in alignment with course learning outcomes, alignment of mission at institutional and program levels, alignment of the mission with learning outcomes, then program outcomes with the curriculum, flowing down to course outcomes and the assignments. Assessment activities emphasize analysis of results and feedback loops for continuous improvement. The additional evaluation includes tracking of student retention, grade distributions, and cost-effectiveness, with regular academic program reviews considering these factors.

The program will participate in the Graduate School Program Review process detailed below:

The Council of Graduate Schools[1] notes that graduate program review has five general purposes: quality assurance, quality improvement, accountability, identification of strategies for improvement, and provide the institution with information for prioritization of resources. Reviews share specific key characteristics:

1. Program review is evaluative, not just descriptive. It requires academic judgments about the quality of the program and the adequacy of its resources. It goes beyond the assessment of

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[1]Assessment and Review of Graduate Programs: A policy Statement. 2005. Washington, DC: Council of Graduate Schools.

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minimum standards to subjective evaluations of quality by peers and recognized experts in the discipline or field.

2. Review of graduate programs is forward-looking; it is directed toward improvement of the program, not merely assessment of its current status. It makes specific recommendations for future changes, as part of the long-range plans of the institution, the department, and other coordinating units.

3. Programs being reviewed are scrutinized on the bases of academic strengths and weaknesses, not on their ability to produce funds for the institution or generate development for the state. Finances and organizational issues are relevant, but only as they affect the quality of the academic program.

4. Program review is an objective process. It asks graduate programs to engage in self-studies that assess, as objectively as possible, their programs. It brings in faculty from other institutions to review the self-studies and to make their evaluations.

5. Graduate program review is an independent process, distinct from any other review. Data collection and parts of the self-study may often serve some review purposes. However, to be effective, graduate program review must be a unique, identifiable process that stands on its own, draws its own set of conclusions, and directs its recommendations to the only individuals with the power to improve graduate programs: the faculty and administrators of the institution.

6. Program review results in action. Based on the reviewers' comments and recommendations, as well as the program faculty's response to the review report, the institution develops and agrees on a plan to implement the desired changes according to a specific timetable.

Incorporating these characteristics, successful graduate program review answers the following questions:

Is the program advancing the state of the discipline?
Is its teaching and training of students effective?
Does the program meet the institution's goals?
How do experts in the field assess it?

At UMB Graduate Program Review includes an internal self-study and an on-site review by an external site team.

N. Consistency with the State's Minority Student Achievement Goals

A key feature of UMB's mission and strategic planning involves respecting, valuing and achieving diversity. The Strategic Plan states: diversity represents a core value, which is defined as being "committed to a culture that is enriched by diversity, in the broadest sense, in its thoughts, actions, and leadership" (University of Maryland, Baltimore, n.d.). The State also has a goal of expanding educational opportunities for minority and educationally disadvantaged students.

The proposed MS-DEIL aims to address both UMB's and the State's cultural diversity goals. First, the delivery of the majority of the courses in the program through the use of distance learning technology will enhance student access, as it expands access and success for learners from diverse communities. Essentially, distance learning is quickly becoming the educational opportunity for students who may not or would not be able to participate in a traditional in-

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person college education. For rural and isolated communities, distance learning can be the vehicle that conquers geography and space between teachers and students. The emergence of so-called "virtual universities" has had more success in attracting diverse populations compared to traditional colleges. Ibarra (1999) asserts that historically underrepresented groups are highly attracted to internet-based degrees that embrace the core values of social change and community engagement.

The second manner in which the new MS-DEIL addresses diversity goals is that distance learning not only achieves "access," but can also help ensure "success," as the technology of distance learning meets the needs of various learners and allows for differentiated instruction. Essentially, with the proper use of its varied technology, distance learning can address the needs of all populations, creating an environment where students can thrive. In contrast with many universities that have a predominance of a particular and preferred learning environment grounded in outmoded ideas about one-size fits all educational pipelines, the varied types of interactions common in distance education embrace a shift from passive to active learning and from competition to collaboration. Furthermore, different learning styles and cultures can be accommodated more easily because useful collaborative learning values diversity (Palloff & Pratt, 2005).

Additionally, UMB realizes that it must not only embrace and celebrate diversity but also provide opportunities for students to develop into practitioner who marshal agency, organizational, and/or institutional efforts to create and maintain environments that go further than supporting the needs of individuals of diverse identities, but center the belongingness and the critical examination of policies and practices that disproportionately impact individuals and groups based on their group membership. The MS-DEIL uses an interdisciplinary approach to positively influence the climate for diversity, equity, and inclusion which includes consideration of external (i.e., governmental/political forces and sociohistorical forces) and internal (i.e., historical legacy of inclusion or exclusion, compositional diversity, psychological climate, behavioral dimension, organizational/structural diversity) factors deemed necessary to understand and shape campus environments (Hurtado, Milem, Clayton-Pedersen, & Allen, 1999; Milem, Chang, & Antonio, 2005).

O. Relationship to Low Productivity Programs Identified by the Commission

The proposed new MS-DEIL program is not directly related to an identified low productivity program identified by the Maryland Higher Education Commission.

P. Adequacy of Distance Education Programs

The Context of Online Education at UMB

As the State's public health, law, and human services university, the mission of UMB is to excel at professional and graduate education, research, patient care, and public service, and to educate leaders in health care delivery, biomedical science, global health, social work, and the law. Also, UMB emphasizes interdisciplinary education in an atmosphere that explicitly values civility, diversity, collaboration, and accountability. UMB expects to achieve its mission in educational excellence and to be competitive; the Graduate School has designed and offered

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online degree programs that respond to the following changes occurring in higher education (Picciano, Seaman, & Allen, 2010):

- Education Pipeline. The education pipeline is now seeing inputs at every level with a highly diverse prospective student pool. Prospective students are typically working adults who demand part-time and non-residential educational opportunities. Results of the educational experience are becoming ever more outcomes-based.
- Changing Demographics. Data indicate a shift from the traditional-aged student (i.e., 18-22-year old, full-time resident) to older students studying part-time.
- Technology Shift. Online delivery is far outpacing traditional forms of delivery. From 2002 to 2008, online enrollments grew at an annual compound rate of 19% vs. 1.5% for all of higher education. By the fall of 2008, 25% (4.6 million) of all students took at least one online course. There is a growing acceptance that online education is as good as or better than traditional face-to-face delivery models. It is estimated that online learning will grow by 31% from 2020 to 2025.
- The growth of Mobile Technologies. Mobile technologies and miniaturization are changing the computing environment and the educational delivery paradigm. Technologies like netbooks, e-Readers, iPhones, and iPads have the potential to revolutionize the delivery space and to provide anywhere, anytime learning.
- Web 2.0 Revolution. Other technologies that are already figuring widely into the future of education are part of the Web 2.0 revolution. The use of a variety of technologies is disaggregating the educational experience into 'the cloud.' Many of the technologies for the future, like blogs, wikis, podcasts, video, social networking, and social media, virtual worlds, mobile learning, and Personal Learning environments, will have profound effects on the future learning landscape.

Essentially, online education represents a strategy that can address the restrictions of college courses that are delivered onsite. Online learning seeks to expand knowledge beyond the walls of the campus and can reach millions of new learners who could never put their lives on hold to complete a certificate or degree mainly delivered or solely on a college campus. Online programs also can respond to individual student learning needs and styles in ways that cannot be duplicated in the face-to-face classroom. Significant determinants of successful online programs include 1) course design that incorporates best practices, 2) quality faculty who can engage students in the material, and 3) responsible academic oversight. All three of these determinants are present in this proposal.

Instructional Design Team

The following individuals from the Faculty Center of Teaching and Learning will direct the distance education strategy for the MS-DEIL program:

Christina Cestone, PhD | Executive Director, Faculty Center for Teaching and Learning
Dr. Cestone earned a Ph.D. in Educational Psychology from the University of Texas at Austin and a Master's degree in Human and Organizational Learning from The George Washington University. Dr. Cestone research includes faculty learning communities, instructional methods,

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motivation, and interprofessional education. Most recently, as Associate Dean of Assessment and Evaluation for Drexel University, College of Medicine, Dr. Cestone directed medical student assessment, and course and curriculum evaluation in an integrated medical curriculum for 1,100 medical students. Her interests are in program evaluation, and curriculum and instructional development involving active learning methods. She presents her work nationally and is active in the American Education Research Association (AERA) and the Professional and Organizational Development Network (POD), a national association of directors of Centers for Teaching and Learning.

Kevin Engler, MA | Instructional and Curriculum Designer
Mr. Engler holds a Masters of Arts degree in Instructional Design. Mr. Engler provides instructional design, audio-visual support, and faculty training in the use of instructional technologies. He is responsible for the overall pedagogy, planning and designing of course content and assessments for distance education courses in the program. Mr. Engler is knowledgeable in adult learning theory, distance education pedagogical techniques, course development planning and process management. Mr. Engler is trained and certified in the Quality Matters methodology and the ADDIE approach to course design. He has experience and background in writing instructional objectives that utilize Bloom's Taxonomy.

Erin Hagar, MA/MFA | Instructional and Curriculum Designer
Ms. Hagar taught Spanish at the college level and has worked in instructional and curriculum design for colleges and universities since 2000. She previously worked at Montgomery Community College and Johns Hopkins University, helping faculty incorporate new pedagogical practices and technologies into their face-to-face and online courses. Her areas of expertise include faculty development and training, online course design using the Quality Matters standards, and authentic activities and assessments. She is responsible for the overall pedagogy, planning and designing of course content and assessments for distance education courses in the program.

Sharon Gillooly | Senior Media Production Specialist
Ms. Gillooly leads media production for the AIDE team. Her main focus is to produce videos that support academic instruction. After a long career in documentary television, she completed a Master's Certificate in Online Instructional Development from Florida State University where her work focused on instructional design and emerging technologies. Ms. Gillooly is especially interested in the use of media to enhance learning.

Eric Belt, MS | Senior Academic Innovation Specialist
Mr. Belt holds a Master of Arts degree in distance education and e-Learning. He is an educational technology doctoral student at Boise State University pursuing research in communication, interaction, and engagement in online courses. He was previously the director of learning technology at the College of Southern Maryland and, formerly, the assistant director of e-Learning at Howard Community College. Mr. Belt has served as an instructional designer both virtually and on-campus for various community colleges across the United States. He has a passion for advancing the scholarship of teaching and learning through course design, instructional communication, and faculty professional development.

Becky Menendez, MA/MEd | Academic Innovation Specialist

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Ms. Menendez holds master's degrees in elementary education, teaching English as a Second Language, and educational technology. She has a deep understanding of educational practice and design in higher and postsecondary education, particularly with English language learners, and has supported online course design for the International Baccalaureate, the Community College of Baltimore County, and Penn State University. Ms. Menendez is a trained Quality Matters peer reviewer, providing feedback and guidance to institutions on improving the quality of their online courses.

Collectively, the FCTL team will provide the following services to ensure that best pedagogical practices are used to train and support the most of effective presentation of their course content.

- Guided tutorials on the online course development process, with open questions and answer session.
- Written instructions accompanied by training videos to guide faculty on how to use the learning management system.
- A manual for the faculty regarding principles of good practice and the pedagogy of distance education.
- Provide timely support to the faculty in the use of the technology and trouble shoot any problems that might arise during the course of instruction.
- Work with faculty to design and develop courses, monitor the delivery of the course, and assess and revise the course for future offerings.

Course development and curricular oversight will be accomplished in partnership with a program director, teaching faculty, and the instructional design team, who will ensure course materials follow best practices in online education and adult learning theory. Collectively, they will produce the following materials:

- Course-level outcomes and module level objectives
- Course storyboards that will serve as planning documents for new courses that outline objectives, discussion prompt and learning activities, and resources (e.g., articles, websites, online videos)
- Assignments and assessments that measure student performance and clear instructions for completing them
- Grading Rubrics
- Course syllabus

Supporting Students in Distance Education

All of the courses for the MS-DEIL will occur online utilizing distance learning technologies and will utilize both synchronous and asynchronous learning. We realize that the key to the success of the online courses is dependent on a) students knowing upfront the assumptions, requirements, and responsibilities of taking an online course, 2) the ability of students to have the background, knowledge, and technical skills to undertake an online program; and 3) their having access to academic and technical support services to support their online activities.

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Accordingly, we will provide the following services to support the students in accessing distance learning technology:

- Communicate to students the nature of online learning, including their requirements, roles and responsibilities, and access to support services. We have also prepared a short questionnaire for students that will help them decide whether online learning is right for them. All of our advertising, recruiting, and admissions materials shall clearly and accurately represent the program and the services available.
- Ensure that enrolled students shall have reasonable and adequate access to the range of student services to support their learning.
- Ensure that accepted students will have the background, knowledge, and technical skills needed to undertake the program.
- Make available the library's services to students so that they can have access to research databases, the online catalog of books and media, chat with or e-mail a Librarian, electronic interlibrary loan, and more.

Evaluation and Assessment of Online Courses

We will adhere to a quality improvement model for assuring the continuous quality of the online courses. The process will involve the following steps:

1. Assessment of course readiness as measured by our quality indicators of best practices (including assessment of faculty readiness)
2. Monitoring of course delivery as assessed by the instructional designers with the use of our "course evaluation' rubric."
3. Obtain feedback from the faculty and students and instructional designers.
4. Analysis of feedback as performed by the Distance Learning Committee.
5. Institute course revisions based on comments by the Distance Learning Committee.

Finally, to ensure the sustainability of the distance learning program, the Academic Affairs Office at UMB affirms the following:

- UMB Policies for faculty evaluation includes appropriate consideration of teaching and scholarly activities related to programs offered through distance learning.
- Commitment to ongoing support, both financial and technical, and to a continuation of the program for a period sufficient to enable students to complete a certificate.

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Appendix A. Sample Plan of Study for Students starting Fall 2022

Master of Science: Diversity, Equity and Inclusion Leadership Fall 2022 Start Year 1		
	Course	Credits
Fall A	MLL 625: Intercultural and Cross-Cultural Communication	3
Fall B	INCL 632: Historical Exploration of Race in the U.S.	3
Spring A	INCL 633: Historical Exploration of Culture in the U.S.	3
Spring B	INCL 640: Practical Application of Intercultural Leadership	3
Spring B	INCL 643: Intercultural Impact Institute	1
	Subtotal	13

Year 2		
	Course	Credits
Fall A	DEIL 710: Employment Discrimination Law & Policy Framework	3
Fall B	HPE 615: Introduction to Statistics	3
Spring A	DEIL 720: Critical Appraisal of DEI Literature	3
Spring B	DEIL 740: Strategic Executive Writing	3
	Subtotal	12

Year 3		
	Course	Credits
Fall A	DEIL 790: DEI Evidence-Based Leadership Toolkit	3
Fall B	DEIL 798: Capstone for Diversity, Equity and Inclusion Leadership	3
	Subtotal	6
	Total	31

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Appendix B. Sample Plan of Study for Students starting Spring 2023

	Master of Science: Diversity, Equity and Inclusion Leadership Spring 2023 Start Year 1	
	Course	Credits
Spring A	DEIL 720: Critical Appraisal of Diversity, Equity, and Inclusion Literature	3
Spring B	DEIL 740: Strategic Executive Writing	3
	Subtotal	6

	Year 2	
	Course	Credits
Fall A	MLL 625: Intercultural and Cross-Cultural Communication	3
Fall B	INCL 632: Historical Exploration of Race in the U.S.	3
Spring A	INCL 633: Historical Exploration of Culture in the U.S.	3
Spring B	INCL 640: Practical Application of Intercultural Leadership	3
Spring B	INCL 643: Intercultural Impact Institute	1
	Subtotal	13

	Year 3	
	Course	Credits
Fall A	DEIL 710: Employment Discrimination Law & Policy Framework	3
Fall B	HPE 615: Introduction to Statistics	3
Spring A	DEIL 790: Diversity, Equity, and Inclusion Evidence-Based Leadership Toolkit	3
Spring B	DEIL 798: Capstone for Diversity, Equity and Inclusion Leadership	3
	Subtotal	12
	Total	31

Appendix C: Budget

TABLE 2: PROGRAM EXPENDITURES:					
Expenditure Categories	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**
1. Faculty (b + c below)	$44,694	$97,613	$104,572	$96,614	$99,512
a. Number of FTE	0.425	0.913	1.025	0.875	0.875
b. Total Salary	$35,698	$77,966	$83,524	$77,168	$79,483
c. Total Benefits	$8,996	$19,647	$21,048	$19,446	$20,030
2. Admin. Staff (b + c below)	$16,680	$28,495	$24,325	$9,091	$9,363
a. Number of FTE	0.20	0.28	0.24	0.10	0.10
b. Total Salary	$12,000	$20,500	$17,500	$6,540	$6,736
c. Total Benefits	$4,680	$7,995	$6,825	$2,551	$2,627
3. Support Staff (b + c below)	$6,950	$7,159	$7,373	$7,594	$7,822
a. Number of FTE	0.10	0.10	0.10	0.10	0.10
b. Total Salary	$5,000	$5,150	$5,305	$5,464	$5,628
c. Total Benefits	$1,950	$2,009	$2,069	$2,131	$2,195
4. Technical Support and Equipment	$0	$0	$0	$3,000	$3,000
5. Library	$0	$0	$0	$5,000	$5,000
6. New or Renovated Space					
7. Other Expenses					
TOTAL (Add 1 – 7)	**$68,324**	**$133,267**	**$136,270**	**$121,299**	**$124,698**

TABLE 1: PROGRAM RESOURCES					
Resource Categories	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**
1. Reallocated Funds					
2. Tuition/Fee Revenue (c +g below)	**$0**	**$0**	**$0**	**$0**	**$0**
a. Number of F/T Students*					
b. Annual Tuition/Fee Rate					
c. Total F/T Revenue (a x b)					
d. Number of P/T Students	9	14	20	24	24
e. Credit Hour Rate	$750	$773	$796	$820	$844
f. Annual Credit Hour Rate	8	8	8	8	8
g. Total P/T Revenue (d x e x f)	**$54,000**	**$86,520**	**$127,308**	**$157,353**	**$162,073**
3. Grants, Contracts & Other External Sources	**$0**	**$0**	**$0**	**$0**	**$0**
4. Other Sources	**$14,324**	**$46,747**	**$8,962**	**$0**	**$0**
TOTAL (Add 1 – 4)	**$54,000**	**$86,520**	**$127,308**	**$157,353**	**$162,073**

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Appendix D: Graduate School Policies

Purpose: Satisfactory academic performance and progress within the University of Maryland Baltimore's master's degree (MS-DEIL) programs is a shared responsibility of the University of Maryland Baltimore Graduate School (UMBGS), the Masters Programs, and graduate students. This policy specifies the elements of satisfactory academic performance and progress for students in UMBGS MS-DEIL programs (University of Maryland Baltimore, n.d.).

UMBGS Standards

- After admission to a master's program, each student must continue a course of study and must register fall and spring semesters unless on an approved leave of Absence. Failure to comply with the requirement to register every semester will be taken as evidence that the student has terminated his or her program and admission status in the Graduate School.

- Students accepted provisionally will have provisional admission status removed only after all provisions have been satisfied and the student has fulfilled all other UMBGS and Masters Program requirements for non-provisional admission. This determination will be made by the Graduate Program Director and the UMBGS Academic Coordinator.

- Graduate students must maintain a minimum, cumulative grade point average (GPA) of 3.0 on a 4.0 scale.

- UMBGS does not impose a uniform protocol for preliminary, qualifying, or comprehensive examinations. Admission to candidacy occurs after fulfilling Masters Program requirements.

- Students must establish and maintain a professional relationship with a faculty research advisor. The advisor must hold Regular membership in the Graduate Faculty with the appropriate knowledge and expertise to serve as research advisor.

- Students must demonstrate the ability to conduct independent research by developing, presenting, and defending an original dissertation on a topic approved by the Masters Program. Evidence of completion of this requirement is a submission of the committee approved dissertation to the Graduate School.

- UMBGS requires that students take and pass a masters examination of the dissertation comprised of an open presentation and a formal examination. The formal examination can only be attempted twice. A failure on the second attempt means the MS-DEIL degree is forfeited.

- Students must be admitted to candidacy within five academic years of the first term of enrollment in the Masters Program and at least two full sequential semesters or sessions (spring, summer, or fall) before graduation. All degree requirements, including the final examination of the dissertation, must be completed within four years of admission to candidacy and no more than nine years after admission into the Masters Program.

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- Students are expected to meet the highest standards of academic integrity. Plagiarism, fabrication, falsification, cheating, and other acts of academic dishonesty, or abetting the academic dishonesty of another will result in sanctions and may lead to academic dismissal.

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UNIVERSITY SYSTEM
of MARYLAND

TOPIC: University of Maryland, College Park: Master of Extension Education Program

COMMITTEE: Education Policy and Student Life

DATE OF COMMITTEE MEETING: Friday, March 5, 2021

SUMMARY: The University of Maryland, College Park (UMD) proposes to establish a Master of Extension Education. The program builds on the tradition of extension programming offered to communities by land-grant institutions such as UMD, which offers extension programming in a variety of areas including agriculture, youth development through 4-H, food and nutrition, health and wellness, home gardening, the environment, personal finance, and other topics. Extension education encompasses the broad process of using non-formal education skills to detect societal challenges, examine solution options, and develop action plans with individuals and communities toward a goal for improved quality of life. The focus on intertwined academics, applied research, and engagement with diverse communities provides a multidimensional problem-solving and learning environment for students. This program will provide individuals with an academic credential for employment or advancement in university extension jobs. Graduates with extension education training will also be prepared for careers in secondary and post-secondary education, non-profit organizations, government, and leadership roles in the private sector.

The program requires 30 credits, including 12 credits of core courses that reflect the essential elements of knowledge and skill development for extension education, and 18 credits in a particular subject area that extension education serves, such as animal science, plant science, environmental science and technology, nutrition and food science, and landscape architecture.

ALTERNATIVE(S): The Regents may not approve the program or may request further information.

FISCAL IMPACT: No additional funds are required. The programs can be supported by the projected tuition and fees revenue.

CHANCELLOR'S RECOMMENDATION: That the Education Policy and Student Life Committee recommend that the Board of Regents approve the proposal from the University of Maryland, College Park to offer the Master of Extension Education Program.

COMMITTEE RECOMMENDATION:	DATE: March 5, 2021
BOARD ACTION:	DATE:
SUBMITTED BY: Joann A. Boughman 301-445-1992	jboughman@usmd.edu

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UNIVERSITY OF MARYLAND

OFFICE OF THE PRESIDENT

Main Administration Building
College Park, Maryland 20742
301.405.5803 TEL   301.314.9560 FAX

January 15, 2021

Chancellor Jay A. Perman
University System of Maryland
3300 Metzerott Road
Adelphi, MD 20783

Dear Chancellor Perman:

I am writing to request approval for a new Master of Extension Education program. The proposal for the new program is attached. I am also submitting this proposal to the Maryland Higher Education Commission for approval.

The proposal was endorsed by the appropriate faculty and administrative committees. I also endorse this proposal and am pleased to submit it for your approval.

Sincerely,

Darryll J. Pines
President
Glenn L. Martin Professor of Aerospace Engineering

DJP/mdc

cc: Antoinette Coleman, Associate Vice Chancellor for Academic Affairs
        Mary Ann Rankin, Senior Vice President and Provost
        Craig Beyrouty, Dean, College of Agriculture and Natural Resources

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UNIVERSITY SYSTEM OF MARYLAND INSTITUTION PROPOSAL FOR

x   New Instructional Program

_____ Substantial Expansion/Major Modification

_____ Cooperative Degree Program

x   Within Existing Resources, or

_____ Requiring New Resources

_____

University of Maryland, College Park
_____
Institution Submitting Proposal

Extension Education
_____
Title of Proposed Program

Master of Extension Education	**Fall 2021**
Award to be Offered	Projected Implementation Date
010101	**01.0801**
Proposed HEGIS Code	Proposed CIP Code
Plant Sciences and Landscape Architecture	Melissa Leiden Welsh
Department in which program will be located	Department Contact
301-405-6969	drmwelsh@umd.edu
Contact Phone Number	Contact E-Mail Address
	01-15-2021
Signature of President or Designee	Date

A. Centrality to the University's Mission and Planning Priorities

Description. The proposed Master of Extension Education embodies the historic founding principles of the Land Grant mission of the University of Maryland. The focus on intertwined academics, applied research, and engagement with diverse communities provides a multidimensional problem-solving learning environment for students. This program mirrors the University's mission and vision through the intent to expand an individual's knowledge while building life science and social science research skills coupled with enabling their teaching skills through outreach, more commonly known as non-formal facilitation. The interdisciplinary focus of this program has been designed to equip students with opportunities to examine, develop, and analyze educational projects in collaboration with their career focus such that authentic and impactful experiences prepare the students to communicate community-based research with various populations.

Relation to Strategic Goals. The proposed Master of Extension Education relates to UMD's strategic goals through multiple dimensions. Most relevant are the goals of delivering high quality graduate education at all levels and those to deploy UMD's scholarly resources and service activities to solve pressing problems in the local community and the state. The Extension unit of the College of Agriculture and Natural Resources reaches all corners of the state and a number of differing areas of the state's economy. Extension education uses non-formal education skills, working with the community across the State of Maryland, to detect societal challenges, examine solution options, and develop action plans with individuals and communities toward a goal for improved quality of life. Maryland's diversity of people, land, and occupations provide significant opportunities for study across various dimensions of research and outreach education.

Funding. Resources for the new program will be drawn from a modest reallocation of effort from within the College of Agriculture and Natural Resources.

Institutional Commitment. The program will be administered by the Department of Plant Sciences and Landscape Architecture within the College of Agriculture and Natural Resources at the University of Maryland. The College has the capacity to launch this program with the recent hiring of an assistant clinical professor in extension education, along with support from faculty from across the college in various disciplines as well as the cadre of existing Agents within the Extension unit. Although the campus is currently under a hiring freeze, the College has a long-standing, multi-year commitment to re-establish this program, and the Dean has committed to hiring an additional faculty member to support the program as soon as is feasible.

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

Need. In the mid-nineteen nineties, the Agricultural Extension Education programs at the University of Maryland were discontinued, due to a variety of reasons. Outreach efforts continued informally through Extension programming, as is customary with Land Grant universities. However, individuals needing the academic credentials to seek employment within university Extension positions would have to acquire their training at other universities or specialize in a content field and then utilize professional development options within early career work to understand Extension principles. Over time, consistent feedback from stakeholders revealed the need for more formal coursework directed toward Extension education as well as development of an advanced degree for individuals seeking to advance their careers in addition to expanding their knowledge and skills.

The proposed program is designed to meet the needs of these professionals within the University Extension, but also those in non-profit organizations, community agricultural outreach, technical institutes, and agricultural education. These areas, in-turn, support the growing local and state agricultural community and broader agricultural industry of the mid-Atlantic region. Respondents (n=154) to a survey of current Extension professional and agricultural education stakeholders within the state of Maryland revealed an immediate interest of 55 individuals in achieving a graduate degree in Extension Education. Additionally, those not interested in obtaining a degree at this time expressed interest in completing courses for professional development. The initial students for the program would be off-site Extension professionals (current UMD employees) or those seeking entry level

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positions within Extension. However, various stakeholders across the state, nationally and internationally with whom the College has existing relationships have also expressed interest in this kind of a program.

State Plan. The proposed program aligns with the *Maryland State Plan for Postsecondary Education* in several ways*.* County Extension educators support their local communities not only in areas well beyond agriculture, including 4-H youth programs, family and consumer sciences, and natural resource management. All of these are focused on improving the lives of Maryland citizens. The Family and Consumer Sciences programs contribute directly to Strategy 2, cultivating greater financial literacy. The 4-H youth programs dovetail with strategies 1 and 2, to improve student readiness for higher education. More broadly, the Master of Extension Education program connects directly to Strategy 7 to enhance career opportunities for Extension professionals across the state.

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

Extension specialists work in a variety of life, physical, and social science fields. The U.S. Bureau of Labor Statistics reports a projected 7% growth in these fields from 2018-2028. The increasing demand for expertise in the sciences is growing faster than the average for all occupations. Many land grant colleges' degrees in Extension are aligned with agricultural education programs, and it is common for an agricultural education teacher to acquire a Masters in Extension Education. The annual National Agricultural Education Supply & Demand reports reflect the number of openings and the pool of graduates to fill those vacancies. While the overall job outlook by the U.S. Bureau of Labor Statistics for Career and Technical Education teachers is estimated to hold steady with a potential one percent drop in projected employment by 2028, the 2018 National Agricultural Education Supply & Demand Study reported a shortfall of licensed or alternatively licensed agricultural teachers nationwide. The report stated 247 new positions and 140 new programs were added in the 2017-18 school year. With regard to Extension field based positions in Maryland, the Agriculture and Food Systems Program has filled five positions in the last two years and two more positions are expected to be filled this year, although two additional positions will not be filled at this time due to Covid-19. Over the next five years, there will be a significant number of retirements from the UME Agriculture and Food Systems Program (~25%).

D. Reasonableness of Program Duplication

This program is a revitalization of a historic program at the University of Maryland and this type of degree program is typically offered only at Land- grant institutions. There is no other master's level program focused on Extension Education currently offered at another site in Maryland.

E. Relevance to Historically Black Institutions (HBIs)

No Historically Black Institutions (HBIs) in Maryland offer this master's degree program. The University of Maryland Eastern Shore (UMES) does have a master's program in Food and Agricultural Sciences with an area of concentration in Agricultural and Extension Education. UMD's college of Agriculture and Natural Resources discussed the proposed program with the UMES School of Agricultural and Natural Sciences. Both schools determined the program would not have a negative impact on the UMES program, and the two schools agreed that future collaboration in this area would be mutually beneficial.

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

The proposed program should not negatively impact the identity of HBI's in the state of Maryland. UMD and UMES both have well-established agricultural programs. Rather than negatively impacting UMES's program, the proposed program should serve as a catalyst for future collaboration between the two institutions.

G. Adequacy of Curriculum Design, Program Modality, and Related Learning Outcomes

Curricular Development. As part of the effort to restart this program, the College of Agriculture and Natural Resources hired an assistant clinical professor, Melissa Welsh, whose expertise is in agriculture education programs. Dr. Welsh called on the expertise within the department of Plant Sciences and Landscape Architecture, as well as with other faculty in the College to design the core course material and create the structure for the elective pathways.

Faculty Oversight. The faculty within the College of Agriculture and Natural Resources will oversee the curriculum. The Department of Plant Science and Landscape Architecture will provide academic direction and oversight of the program as well as instructors for the four core courses. Faculty from across the College will provide instruction for a majority of elective courses in the program. A list of engaged faculty and their roles in the program are provided in Appendix A.

Educational Objectives and Learning Outcomes. The Master of Extension Education program reflects educational objectives in critical thinking, leadership, and relationship building. Students will examine multiple modes of educational delivery methods. Courses will enhance students' selection and application of quantitative and qualitative data collection skills within authentic learning experiences. The program of study prepares students for the process of conducting needs assessment with recognition of cultural, emotional, and social sensitivity among varying communities while encouraging rigorous scientific practices to develop practical solutions to identified problems. The primary program objectives are list below.

1. Examine educational psychology concepts as applied within the field of Extension education.
2. Utilize critical thinking and communication skills to engage with stakeholders.
3. Develop scientific literacy through independently assessing, interpreting, and summarizing scholarly works.
4. Expand academic and technical knowledge through authentic and active learning experiences.
5. Increase student's awareness of navigating programming with local, state, national and global systems.

Institutional assessment and documentation of learning outcomes. The relationship between program objectives and program learning outcomes and assessments are included in Appendix C. The University has a robust campus-wide set of procedures for learning outcomes assessment at the undergraduate level and has a pilot underway for graduate level instruction.

Course requirements.   The proposed 30-credit program includes four required courses (12 credits), followed by 12-18 credits of elective courses offered on a wide variety of topics. Students pursuing the thesis option will take 12 credits of electives and 6 credits of thesis research; those pursuing the non-

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thesis option will take more elective courses to complete the full 30 credits and complete a publication quality document relevant to their area of study. Students will work with a faculty advisor to identify and enroll in a set of elective courses that align with their career focused learning outcomes. Areas that students may pursue are well-align with the disciplines within the College of Agriculture and Natural Resources, including but not limited to Plant Science, Animal Science, Environmental Science, Nutrition, and Agricultural Economics. A sample of course titles included in Appendix B, but due to the length, not all course descriptions are included here – they are available in the UMD Graduate Catalog at https://academiccatalog.umd.edu/graduate/courses/ . A sample course plan for a student interested in focusing on Food systems and Agriculture Extension career while employed in a full-time job. Course descriptions for the four core courses and those in this sample plan are included in Appendix B.

Core Curriculum (courses with a * are new and submitted for approval)

Course	Title	Cr
AGNR 606	Program Planning and Evaluation in Agricultural Education	3
AGNR 630	Teaching-Learning in Adult and Continuing Education	3
*AGST 605	Extension Research Methods and Applied Data Analysis	3
*AGST 640	Critically Examine Maryland Agriculture, Agricultural Industry and Agriculture Literacy.	3
	Total Core Credits	**12**

Sample Plan for a student interested in Food Systems

Course	Title	Cr
NFSC 690	Nutrition and Aging	3
NFSC 440	Advanced Human Nutrition	4
NFSC 430	Food Microbiology	3
ENTM 609	Integrated Pest Management	1-4
AGST 799	Master's Thesis Research	1-6
	Total Elective Credits (must be at least 18)	**20 max**

General Education.

N/A

Accreditation or Certification Requirements.

N/A

Other Institutions or Organizations. The department does not currently intend to contract with another institution or non-collegiate organization for this program. However, students do have the opportunity to fulfill elective options, in consultation with their academic advisor, at a number of universities with the metropolitan DC area through the Washington Area Consortium, as well as through inter-institutional enrollment within the University System of Maryland.

Student Support. As students are admitted into the program, they will meet with the program leaders who will assist them in creating a graduate committee and a set of electives that meet their career

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objectives. Students will also be connected to other professionals beyond the University if their interests cannot be met by University expertise. Student progress will be reviewed on an annual basis.

Marketing and Admissions Information. The initial focus of the program are county extension professionals who seek the added credential to advance their career. As the program develops, the College will use its existing relationships throughout the state, as well as internationally, to make its program known and recruit additional students. Admission to the program will follow the requirements of the University of Maryland Graduate School.

H. Adequacy of Articulation

N/A

I. Adequacy of Faculty Resources

Program faculty. Appendix A contains a list of faculty who will be engaged in the core curriculum.

Faculty training. Faculty teaching in the program will use the University's learning management system along with its extensive electronic resources. They will have access to instructional development opportunities available across the College Park campus, including those offered as part of the Teaching and Learning Transformation Center, many of which are delivered in a virtual environment. Instructors will work with the learning design specialists on campus to incorporate best practices when teaching in the online environment.

J. Adequacy of Library Resources

The University of Maryland Libraries has conducted an assessment of library resources required for this program. The assessment concluded that the University Libraries are able to meet, with its current resources, the curricular and research needs of the program.

K. Adequacy of Physical Facilities, Infrastructure, and Instructional Resources

The four core courses of the program will be delivered online, asynchronously, to accommodate students who are likely to be working full-time. The elective courses will be delivered in a mix of online and in-person instruction, depending on enrollments and faculty preparation. We do not anticipate that this will be a fully online program at this time.

L. Adequacy of Financial Resources

Resources for the program will be provided by the College of Agriculture and Natural Resources, which has the capacity to launch the program. See Tables 1 and 2 for anticipated resources and expenditures.

M. Adequacy of Program Evaluation

Formal program review is carried out according to the University of Maryland's policy for Periodic Review of Academic Units, which includes a review of the academic programs offered by, and the research and administration of, the academic unit (http://www.president.umd.edu/policies/2014-i-600a.html). Program Review is also monitored following the guidelines of the campus-wide cycle of

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Learning Outcomes Assessment (https://www.irpa.umd.edu/Assessment/LOA.html). Faculty within the department are reviewed according to the University's Policy on Periodic Evaluation of Faculty Performance (http://www.president.umd.edu/policies/2014-ii-120a.html). Since 2005, the University has used an online course evaluation instrument that standardizes course evaluations across campus. The course evaluation has standard, university-wide questions and also allows for supplemental, specialized questions from the academic unit offering the course.

N. Consistency with Minority Student Achievement goals

It is of great importance to recruit and retain a diverse student population since this program is designed to prepare graduates to work with diverse populations across various ecological systems. Students will be encouraged to join supportive student groups such as AGNR's MANRRS: Minorities in Agriculture Natural Resources and Related Sciences. MANRRS promotes academic and professional advancement by empowering minorities in agriculture, natural resources, and related sciences. Recognizing the changing demographics in agriculture, the program leadership will work to mentor minority students with intentional supplemental programing.

O. Relationship to Low Productivity Programs Identified by the Commission

N/A

P. Adequacy of Distance Education Programs

While some of the coursework for this program will be delivered online, we anticipate at this time that more than 50% of the program will be delivered in-person once the pandemic emergency has subsided. Other than the four core course requirements, the majority of courses will be offered in-person.

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Tables 1 and 2: Resources and Expenditures

Table 1: Resources

Resources Categories	Year 1	Year 2	Year 3	Year 4	Year 5
1.Reallocated Funds	$50,000	$30,000	$30,000	$30,000	$30,000
2. Tuition/Fee Revenue (c+g below)	$146,823	$337,945	$348,083	$358,526	$369,282
a. #FT Students	5	10	10	10	10
b. Annual Tuition/Fee Rate	$21,325	$21,964	$22,623	$23,302	$24,001
c. Annual FT Revenue (a x b)	$106,623	$219,643	$226,233	$233,020	$240,010
d. # PT Students	5	10	10	10	10
e. Credit Hour Rate	$820.40	$845.01	$870.36	$896.47	$923.37
f. Annual Credit Hours	14	14	14	14	14
g. Total Part Time Revenue (d x e x f)	$40,200	$118,302	$121,851	$125,506	$129,271
3. Grants, Contracts, & Other External Sources	$0	$0	$0	$0	$0
4. Other Sources	$0	$0	$0	$0	$0
TOTAL (Add 1 - 4)	$196,823	$367,945	$378,083	$388,526	$399,282

Reallocated funds come from a redirection of resources at the College level for initial support of this program.

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Table 2: Expenditures

Expenditure Categories	Year 1	Year 2	Year 3	Year 4	Year 5
1. Faculty (b+c below)	$103,415	$213,036	$219,427	$226,010	$232,790
a. #FTE	1.0	2.0	2.0	2.0	2.0
b. Total Salary	$79,981	$164,761	$169,704	$174,795	$180,039
c. Total Benefits	$23,434	$48,275	$49,723	$51,215	$52,751
2. Admin. Staff (b+c below)	$30,464	$31,378	$32,319	$33,288	$34,287
a. #FTE	0.5	0.5	0.5	0.5	0.5
b. Total Salary	$22,499	$23,174	$23,869	$24,585	$25,323
c. Total Benefits	$7,965	$8,204	$8,450	$8,703	$8,964
3. Total Support Staff (b+c below)	$0	$0	$0	$0	$0
a. #FTE	0.5	0.5	0.5	0.5	0.5
b. Total Salary	$0	$0	$0	$0	$0
c. Total Benefits	$0	$0	$0	$0	$0
4. Graduate Assistants (b+c)					
a. #FTE	0.0	0.0	0.0	0.0	0.0
b. Stipend	$0	$0	$0	$0	$0
c. Tuition Remission					
5. Equipment					
6. Library					
7. New or Renovated Space	$0	$0	$0	$0	$0
8. Other Expenses: Operational Expenses	$60,000	$120,000	$120,000	$120,000	$120,000
TOTAL (Add 1 - 8)	**$193,879**	**$364,413**	**$371,746**	**$379,298**	**$387,077**

Other expenses include tuition remission for existing employees who are the initial primary target audience for program enrollment.

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Appendix A: Faculty in the Department of Plant Science and Landscape Architecture

All of the core faculty who teach at the graduate level hold doctoral degrees in a field relevant to the discipline. All faculty listed are full-time. Specific course assignments have not yet been made, but will be made in time to schedule the courses for the target start term of Fall 2021. Some additional hires are anticipated to support the program in the Department of Plant Science and Landscape Architecture. The full list of department faculty can be found at the department's web site, at https://psla.umd.edu/people/faculty . Specific faculty who are most closely associated with the program are identified below.

Faculty Name	Highest Degree Earned - Field and Institution	Rank
Melissa Leiden Welsh	Ph.D., Youth Development and Agricultural Education, Purdue University	Assistant Clinical Professor; Full-Time
Bill Phillips	Ph.D., Weed/Crop Ecophysiology, University of Maryland	Assistant Clinical Professor; Full-Time
John Erwin	PhD., Horticulture, Michigan State University	Professor and PSLA Chair; Full-Time
Darren Jarboe	Ph.D., Industrial and Agricultural Technology, Iowa State University	Principal Agent & Assistant Director, Agriculture & Food Systems; Full-Time
Joe Sullivan	Ph.D., Plant Physiology, Clemson University	Professor and Associate Dean for Academic Programs; Full-Time
John Lea-Cox	Ph.D., Plant Physiology, University of Florida	Professor; Full-Time
Nicole Fiorellino	Ph.D., Environmental Science and Technology, University of Maryland	Assistant Professor and Extension Specialist; Full-Time
Diana Cochran	Ph.D., Agricultural Science, Mississippi State University	Assistant Clinical Professor; Full-Time
Mengjun Hu	Ph.D., Plant Pathology, Huazhong Agricultural University	Assistant Professor and Extension Specialist; Full-Time

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Appendix B: Course Descriptions

Only the four core courses are listed here, since beyond the 12-credit core students will be able to tailor their curriculum through the many available graduate-level offerings within the College of Agriculture to create a focused plan of study created in collaboration with their academic advisor.

AGNR 606 – Program Planning and Evaluation in Agriculture Education
Analysis of community agricultural and extension education needs, selection and organization of course content, criteria and procedures for deploying and evaluating programs. Critical analysis of diversity, equity and inclusion in the planning process.

AGST 605 -- Extension Research Methods with Applied Data Analysis
Examine foundational qualitative and quantitative research methods in real-world social and behavioral settings for extension and outreach educators. This course enables you to distinguish, select and apply research methods to conduct social science research in a non-formal education setting. A variety of data analysis approaches will be examined across Extension and outreach education applications.

AGNR 630 – Teaching and Learning in Adult and Continuing Education
Critically analyze the teaching/learning process in adult continuing education with a focus on instructional techniques and methodologies appropriate for adults. Students examine the curriculum development process while evaluating issues and priorities in adult continuing education.

AGNR 640 -- Critically Examine Maryland Agriculture, Agricultural Industry and Agricultural Literacy
Examine the mission and history of the Land Grant System as well as appraising the current work conducted through the University of Maryland Extension to extend research to citizens. Often referred to as America in miniature, Maryland boasts diverse people, agricultural practices, cultures, and ecosystems which students will examine to perceive the decision-making processes within and across ecological systems. An enriching field practicum with an agricultural agency is required.

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Appendix C: Program Objectives, Learning Outcomes, and Methods of Assessment

Program Objectives	Student Learning Outcomes Aligned to Program Objectives	Methods of Assessment
Examine educational psychology concepts as applied within the field of Extension education	Demonstrate the selection and application of educational theories to support observed practices in Extension Education.	Student formative presentations and summative artifacts completed within coursework
Utilize critical thinking and communication skills to engage with stakeholders	Hone leadership and relationship building skills while designing needs assessments for research and outreach education	Student constructed community needs assessment plans coupled with expanded professional networks.
Develop scientific literacy through independently assessing, interpreting, and summarizing scholarly works	Organize and present research findings to add to the body of knowledge as well participating in Extension outreach.	Student constructed publications, media and outreach presentations.
Expand academic and technical knowledge through authentic and active learning experiences	Make use of advanced knowledge and skills to identify and problem solve current issues facing urban and rural communities	Student formative presentations and summative artifacts completed within coursework
Increase student's awareness of navigating programming with local, state, national and global systems	Recognize opportunities to differentiate outreach efforts with diverse audiences	Student conduct, presentations, and artifacts reflect inclusive facilitation strategies

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UNIVERSITY SYSTEM *of* **MARYLAND**

TOPIC: University of Maryland Global Campus: Bachelor of Science in Cloud Computing Systems

COMMITTEE: Education Policy and Student Life

DATE OF COMMITTEE MEETING: Friday, March 5, 2021

SUMMARY: The Bachelor of Science (B.S.) in Cloud Computing Systems is designed in a straight line path to equip students with the technical skills and expertise required to analyze an organization's cloud needs, and plan, design, deploy, secure, operate, and maintain cloud computing infrastructure. Through real-world projects, alignment to industry certifications, and hands-on training in state-of-the-art cloud platforms, students will learn how to apply cloud architectural and computing principles, securely manage and operate cloud systems, implement cloud-based applications, and comply with applicable policies.

The B.S. in Cloud Computing Systems program will prepare students for careers in this rapidly growing area. UMGC will offer this program in an asynchronous, online format that allows students who are unable to attend a campus-based program access to education in this emerging field. UMGC's network of educational sites in Europe, Asia, and the US also allow service members access to courses that can be applied to this program while they are stationed in military bases around the world. Additionally, UMGC's program is designed to maximize transfer-credit acceptance from community colleges and workplace learning to assist with progress towards a credential.

ALTERNATIVE(S): The Regents may not approve the program or may request further information.

FISCAL IMPACT: No additional funds are required. The programs can be supported by the projected tuition and fees revenue.

CHANCELLOR'S RECOMMENDATION: That the Education Policy and Student Life Committee recommend that the Board of Regents approve the proposal from University of Maryland Global Campus to offer the Bachelor of Science in Cloud Computing Systems.

COMMITTEE RECOMMENDATION:	DATE: March 5, 2021
BOARD ACTION:	DATE:
SUBMITTED BY: Joann A. Boughman 301-445-1992	jboughman@usmd.edu

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UNIVERSITY OF MARYLAND GLOBAL CAMPUS

OFFICE OF THE CHIEF ACADEMIC OFFICER

January 28, 2021

Jay A. Perman, MD
Chancellor
University System of Maryland 3300 Metzerott Road
Adelphi, MD 20783

Dear Chancellor Perman:

On behalf of the University of Maryland Global Campus (UMGC), this letter serves as official request for a new bachelor's degree program in Cloud Computing Systems. (HEGIS: 07.0211. CIP: 11.0902). In accordance with COMAR 13B.02.03, the following proposal is submitted for your review.

As noted in this proposal, UMGC plans to offer an undergraduate certificate in Cloud Computing and Networking that is embedded within this bachelor's degree program. A proposal for that certificate has also been submitted for your review.

Payment for review of this new academic program has been made to MHEC via R*STARS interagency fund transfer, transaction number JAIA0862, in the amount of $850 in accordance with the MHEC fee schedule.

Sincerely,

Blakely R. Pomietto, MPH
Senior Vice President and Chief Academic Officer

CC: Antoinette Coleman, Associate Vice Chancellor for Academic Affairs, University System of Maryland

3501 University Boulevard East, Adelphi, MD 20783-8001 USA / 301-985-7105 / F 301-985-6432 / umuc.edu

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Academic Program Proposals

A. **Centrality to Institutional Mission and Planning Priorities:**
1. **Provide a description of the program, including each area of concentration (if applicable), and how it relates to the institution's approved mission.**

Consistent with the institutional purpose as stipulated by State statute (Md. Education Code Ann.§ 13-101(2013)1), the mission of UMGC is improving the lives of adult learners. UMGC will accomplish this by:
(1)   Operating as Maryland's open university, serving working adults, military servicemen and servicewomen and their families, and veterans who reside in Maryland, across the United States, and around the world;
(2)   Providing our students with affordable, open access to valued, quality higher education; and
(3)   Serving as a recognized leader in career-relevant education, embracing innovation and change aligned with our purpose and sharing our perspectives and expertise.

Each facet of UMGC's mission has direct bearing on the programs the university offers and how those programs are designed and delivered. By mission and state mandate, every aspect of the UMGC student experience is designed from its origins for working-adult and military-affiliated students to access online education and built to leverage our unique and longstanding expertise in designing online learning. The learning resources, the selection, training, and evaluation of faculty, the non-academic supports, the success-coach advising model, the virtual classroom, the academic resources, the term and session structure, and course length are all deliberately derived from adult-learning science in distributed, online modalities, and the learning ecosystem is designed for a learner experience taking place anywhere in the world. These students' demographic profile drives the design and delivery of our learning model: The average age of UMGC's undergraduate student is 33 years old, 75% of them work full-time, and 46% have dependent children. For these students, their often-complicated life circumstances while pursuing higher education means they need and benefit most from the authentic online education that UMGC has delivered for more than two decades.

Authentic online education is fundamentally different from courses and programs originating at traditional institutions and taught remotely in the same way as face-to-face classes. Instead, authentic online education is a distinctive educational architecture intentionally designed for virtual teaching, learning and assessment, with technology tools strategically deployed for engagement and outcomes, as well as wraparound services that provide support throughout the online student life cycle. These features set UMGC apart in the higher education landscape of Maryland.

Our history and expertise have allowed us to build strong relationships with the military community, which is nothing less than part of UMGC's institutional identity. As of Fall 2020, 65% of UMGC's undergraduate students are military affiliated, including active duty servicemembers, their families, and Veterans. This dimension of UMGC's identity is a particular point of pride, beginning with the university first sending faculty overseas in 1949 to teach America's soldiers on military installations in Europe. The relationship between UMGC and the military has grown ever stronger in the decades since as a result of our intentional program design and delivery model that meets adult learners *where they are,* whether through asynchronous online courses or on military bases in Germany, Italy, Japan, Korea, Guam, Colorado, Virginia, and many other military facilities around the world.

Today UMGC holds competitively awarded contracts from the U.S. Department of Defense (DOD), under which we serve military servicemembers in Europe, Asia, and the Middle East, delivering specifically solicited programs of study identified by the DOD as responsive to the training, education, and upskilling needs of the military. UMGC is recognized as one of the top military- and veteran-friendly schools in the country, with an unmatched expertise and established reputation as a preeminent provider

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of quality, affordable, career-relevant postsecondary education. Recognition as one of the Best Military Friendly Online Colleges (GuideToOnlineSchools.com) and as the Military Times No. 4 Best Cybersecurity Program for 2018, among other accolades, are evidence of UMGC's successful commitment to serving our nation's troops. Most recently, in 2019 UMGC was competitively selected as one of five partner institutions to the emergent U.S. Naval Community College to serve the Navy and Marines.

All of these considerations are reflected in UMGC's proposal herein to offer a new Bachelor of Science in Cloud Computing Systems. The proposed B.S. program in Cloud Computing Systems is designed to meet the growing need for highly skilled professionals who can keep pace with the growth in cloud computing, especially the growing demand for cloud administrators and systems managers. Organizations are increasingly employing cloud computing in order to capture opportunities for innovation, productivity, and efficiency; to be flexible in the use of resources; and to scale adaptively and quickly to business needs. As a result, organizations need individuals with the requisite skills to create, maintain, and manage the virtual environments and technologies associated with cloud-based systems. Additionally, the need to secure these cloud-based systems through policies, control measures, and other engineering and operating procedures has become critical as so much of our economic and social activity rely on cloud-based systems and infrastructure.[1]

An important outcome of this program is to provide students with hands-on experience with a variety of cloud tools and the ability to plan, assess and develop appropriate solutions for the cloud environment. At the same time, students will acquire fundamental knowledge and skills in cloud computing that will equip them to obtain highly desired certifications in cloud technology and adapt to future changes in tools, technology, and the marketplace. The program is designed to prepare graduates who possess an immediately implementable skillset to succeed in a global environment of workforce diversity, increasing competition, and technological innovation – all driven by the accelerated growth in digital data and information at the core of the economy and much of society.

A 2020 (ISC)[2] report identifies a substantial lack of qualified staff in this field.[2] The gap is intensifying: by 2022, organizations will have 75% of their workload on the cloud.[3] This workforce shortage is a significant challenge for organizations, and the size of the gap between supply and demand in the labor market requires a rapid scale-up of cloud computing education via a network of complementary programs across an array of institutions of higher education. The proposed B.S. in Cloud Computing Systems will prepare students for careers in direct response to these critical shortages in qualified cloud professionals.

The proposal aligns with UMGC's mission by providing a learner-focused program based on leading-edge adult learning theory and curriculum design that accommodates the needs of students and the community. In addition, this B.S. in Cloud Computing Systems aligns with UMGC's mission to offer high quality, workplace-relevant academic programs that expand the range of credentials and career opportunities for working adult, federally employed, and military affiliated students. In the School of Cybersecurity and Information Technology specifically, where the B.S. in Cloud Computing Systems will be located, approximately 66% of undergraduate students are military affiliated, of whom approximately 38% are active duty. The average age of the school's student population is 31, 74% of students are working full-time, and 75% are enrolled part-time. On average, UMGC students transfer 38 credits to the university; 43% of students transfer between 30-59 credits and approximately 36% transfer between 60-89 credits. Moreover, UMGC's global reach means nearly 60% of students in the School of Cybersecurity and Information Technology are either non-Maryland residents or enrolled overseas.

The B.S. in Cloud Computing Systems will support these students' professional development with opportunities to learn from employers and peers. Students are given time to practice skills as they progress through formative instruction. The fully online, asynchronous program model offers flexibility, continuing education, and social opportunities to adults interested in refreshing and reshaping their career

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[1] Source: https://www.red-gate.com/simple-talk/cloud/security-and-compliance/how-organizations-can-optimize-cloud-security/
[2] Source: https://www.isc2.org/resource-center/reports/2020-cloud-security-report
[3] Source: https://reprints.forrester.com/#/assets/2/346/RES122882/reports

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opportunities. The curriculum can be completed in a stackable manner: each course leading up to the final capstone experience can lead to an industry certification, and the first five courses in the program also lead to a stacked credential (the UMGC certificate in Cloud Computing and Networking, submitted concurrently with this proposal) that can be earned before graduation.

This program consists of 11 courses (33 credits) in the major plus related elective courses, and general education requirements. A detailed description of the program and courses within the major are described in section G.

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

As the public state and national leader in distance and distributed education, UMGC awards associate, bachelor's, master's and doctoral degrees, as well as undergraduate and post- baccalaureate certificates. The university's academic inventory offers programs that are core to any public university, but UMGC's mission to serve adult students results in a sustained academic emphasis on career-relevant and workforce-aligned programs. Consequently, the university awards degrees and certificates in the arts and humanities, behavioral and social sciences, business and management, health-related fields, computing, education, and technology. As part of its emphasis on career-relevant education, UMGC offers non-credit professional development programs and hosts professional conferences and meetings supporting economic and societal needs of the State.

The B.S. in Cloud Computing Systems will be part of the Department of Cybersecurity in the School of Cybersecurity and Information Technology, one of three new schools established at UMGC in January 2020 as part of a comprehensive reorganization of academic units to position the university for long-term growth and maximum student success. The formation of the School of Cyber and Information Technology powerfully indicates the centrality and criticality of these fields and programs in the institution's identity and role. Moreover, a school dedicated to these disciplines – unique in the state of Maryland – has given UMGC the capacity to optimize and align curricula to the needs of students and employers as mandated by our mission.

The proposed program in Cloud Computing is tightly aligned with UMGC's institutional learning goals that help students master academic and professional content and include a strong emphasis on technology and information literacy. Cloud Computing Systems is, at its core, an interdisciplinary field, requiring synthesis of knowledge across a variety of adjacent fields and technologies. The program builds upon UMGC's general education requirements and a solid understanding of scientific and quantitative reasoning. While cloud computing professionals must function at a high level in terms of technical expertise, the ability to translate this expertise to non-technical managers and other stakeholders is critical to positively impact decision-making processes. Thus, critical thinking and problem solving, communication, teamwork and the ability to work in and support diverse environments are all as important as technical knowledge and skills.

Initial coursework in the B.S. in Cloud Computing Systems includes fundamentals of networking, network virtualization, cloud technologies, fundamentals of Microsoft Azure, and cloud engineering. Taken together, these courses lead to the embedded undergraduate certificate in Cloud Computing and Networking, a certificate that is accessible to both majors and non-majors alike. Later courses in the major address more advanced knowledge and skill development in areas such as cloud-based applications, AWS cloud, cloud security, cloud administration and operations. The capstone course addresses current trends and projects in cloud computing. From the initial courses through to the capstone, the institutional learning goals of developing job-seeking skills and the capacity for lifelong learning are essential for the continuously evolving field of cloud computing. This B.S. program is an institutional priority because it directly addresses UMGC's mission to provide career-relevant and workforce-aligned programs for adult and life-long learners.

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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.)**

No new general funds are required for implementation of this program. The financial table in section L is based only on students entering the new program.

New courses will be developed and funded through existing budget allocation of funds in this Fiscal Year and through a departmental budget allocation as part of the FY 2022 budget process. The program will include an existing base of courses currently offered for the Computer Networks and Cybersecurity program. The financial data in section L reflects an existing base of FTE faculty, administrative staff, adjunct faculty, and support staff, which will be sufficient to support the launch of the B.S. in Cloud Computing Systems. Salaries are shown with benefits at current rates of 37% for full-time staff and 9% for adjunct faculty.

4. **Provide a description of the institution's commitment to:**
   a) ongoing administrative, financial, and technical support of the proposed program

UMGC's support services are designed to accommodate students who may not be physically in Maryland or who would simply prefer to access support remotely. These services are, therefore, intentionally and thoughtfully built for complete online delivery rather than in the primarily face-to-face format that exists on traditional campuses. Support services include the following:

- Help@UMGC provides support services for the learning management system (D2L). A specialized technical support team for D2L questions and problems is available 24 hours a day, seven days a week, 365 days a year. In addition, UMGC trains faculty to handle some D2L troubleshooting, publishes D2L FAQs, provides chat, phone, and e-mail access to a Help Center with a comprehensive knowledge base and includes a peer-to-peer feature in the online classroom to encourage students to help each other with D2L issues.
- The Digital Teaching and Learning unit within Academic Affairs provides instructional-design support and consultation to Help Desk staff and program leadership to optimize the learning environment across delivery modes and resolve challenges or obstacles students and faculty encounter.
- Students also receive 24/7 support in the use of educational technology from UMGC's Virtual Lab Assistance team, which resolves students' technical questions and issues in lab environments. Complementarily, program leadership and faculty support students in the proficiency of use with educational technology tools.
- MyUMGC is a self-service portal that provides access to administrative functions and student records. UMGC has designed this portal to ensure that students around the world can complete administrative tasks and view records at their convenience.
- UMGC's library is directly accessible through a link within each online classroom. The library helps to educate students in the use of information resources and services and develops and manages UMGC's extensive online library collection.
- The Effective Writing Center (EWC) offers an array of writing-related services to students, including review of draft papers, guest lecturers on writing skills for the classroom, a plagiarism tutorial, resources on citing and referencing, and resources to support research activities. The EWC is also directly accessible through a link within each online classroom.
- Turnitin has been integrated within courses as a developmental tool for students to assist with achieving authenticity in their writing.
- Subject matter tutoring is available in select courses. Subject matter tutors can help define and explain concepts, clarify examples from course content, and guide students toward understanding a particular topic. Students can connect with a subject matter tutor by accessing a link in their online classroom.
- The Office of Accessibility Services arranges accommodations for students with disabilities. Students can register with this office via an online form and then work with a staff member to receive appropriate accommodations for either online or hybrid courses. UMGC students move locations

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frequently and often need to adjust their course schedules because of work or family obligations so the Office of Accessibility Services is prepared to help students with transitioning their accommodations even when these changes occur.

- The Office of Career Services and its CareerQuest portal provides quality resources and services to assist students and alumni with their career planning and job search needs including Mentoring and Internship Plus programs. This office supports students who are transitioning from one career to another or are looking to climb up the corporate ladder, in addition to those who are entering the workforce for the first time. The CareerQuest portal is available 24 hours a day, seven days a week and includes an online database that allows students to connect with local and national hiring managers.
- The Alumni Association is a way for graduates to network and connect. Its online community features a career center, information on available chapters, discussion boards, photo sharing, and a resource center.
- The Financial Aid Office helps students understand and navigate the process of filing for financial aid. Extended office hours ensure that students can receive support quickly and staff members have expertise with a variety of financial aid options as UMGC students may be using employer assistance, veterans' benefits, or other aid that is more common among adult student populations.
- Success Coaches assist students with mapping out degree plans, selecting and scheduling courses, and generally navigating the administrative and academic virtual landscape of earning a degree or certificate online.

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

This is not applicable as this program is new.

B. **Critical and Compelling Regional or Statewide Need as Identified in the State Plan:**
1. **Demonstrate demand and need for the program in terms of meeting present and future needs of the region and the State in general based on one or more of the following:**
    a) **The need for the advancement and evolution of knowledge**
    b) **Societal needs, including expanding educational opportunities and choices for minority and educationally disadvantaged students at institutions of higher education**
    c) **The need to strengthen and expand the capacity of historically black institutions to provide high quality and unique educational programs**

As an open access institution, UMGC makes educational opportunities and choices available for all students within the state of Maryland, including new college majority populations – especially military affiliated and working adults most often left behind by higher education. In the School of Cybersecurity and Information Technology, where the B.S. Cloud Computing will be located, approximately 66% of undergraduate students are military affiliated, of whom approximately 38% are active duty. The average age of the school's student population is 31, 74% of students are working full-time, and 75% are enrolled part-time. On average, UMGC students transfer 38 credits to the university; 43% of students transfer between 30-59 credits and approximately 36% transfer between 60-89 credits. And UMGC's global reach means nearly 60% of students in the School of Cyber and Information Technology live outside Maryland, including those enrolled overseas.

In addition, the need for the advancement and evolution of knowledge is a central concept in the curriculum of the proposed Cloud Computing Systems degree. Critical thinking, problem-solving, and communication skills are required skills for a career in the fields associated with cloud computing and are central to the program objective to prepare students to enter the workforce and advance in their careers. The program prepares students with hands-on experience and job-seeking skills in fully virtualized environments accessible worldwide, while developing the capacity for lifelong learning, all essential skills for the continuously evolving field of cloud computing.

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

   The program proposal is designed to meet present and future needs of the state, as identified in 2017-2021 State Plan for Post-Secondary Education: Student Success with Less Debt (State Plan).[4] This program supports the three primary goals in the State Plan in the following ways:

   - The program serves Goal 1 (Access) in the State Plan in that it is designed to support UMGC's overall mission to set a global standard for excellence and to be respected as a leader in affordable and accessible adult education programs. In addition, UMGC administers its programs to meet the University System of Maryland goals of effectiveness and efficiency by employing data-driven decision-making that ensures that academic programs are broadly accessible and offer high quality education at an affordable cost. At UMGC this commitment to affordability and access is synonymous with a commitment to diversity and inclusion. The university's open admission approach is central to this commitment. The process to apply for admission is streamlined and does not require the submission of standardized test scores. The admission requirements for the B.S. in Cloud Computing Systems are aligned with this mission.

   - The program serves Goal 2 (Success) and Goal 3 (Innovation) in the State Plan, as it is based on principles of competency- and performance-based learning that are at the forefront of developments in adult learning in higher education. Competency-based learning is an outcomes-based approach to education that emphasizes what students should know and be able to do to be successful in their disciplines, fields, and careers. The approach is learner-focused, and authentic assessment (the measurement of what students have learned and the competencies students master) is embedded in every step of the learning process to assist students in building real-world, job-relevant competencies in real time. The B.S. in Cloud Computing Systems will employ authentic, project-based assessments that are relevant to tasks that graduates will actually perform on the job; such projects serve as both the means of instruction and assessment of learning in the program. Retention and success focus on students' learning experiences and are improved through enhanced learning resources (e.g. labs, readings, handouts, slides, etc.). These resources are provided online within the learning management system. The methodology and fully asynchronous, on-demand nature of this type of student support is innovative in higher education and online learning, thus reflective of best practices in adult teaching and learning. In this, UMGC fulfills its commitment to be a leader in educational innovation.

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

   Evidence of strong demand for a B.S. in Cloud Computing Systems is derived to important extent from data models generated by Emsi.[5] A keyword search on skills or topics that cloud computing systems emphasizes identifies 66,172 unique job postings nationwide between January 2019 and December 2019 (see Table 1). Of those, 30,041 job postings (45%) required a bachelor's degree (see Table 2). In Maryland, there were 2,204 total job postings between January 2019 and December 2019 with 1,113 (50%) requiring a bachelor's degree (see Table 3). In the same year, there were 6,730 total job postings in the Washington, DC, area, with 3,832 (57%) requiring a bachelor's degree (see Table 4).

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[4] Source: 2017-2021 Maryland State Plan for Postsecondary Education:
http://www.mhec.state.md.us/About/Pages/2017StatePlanforPostsecondaryEducation.aspx
[5] Source: https://www.economicmodeling.com/

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Table 1: Job Postings for DMV vs Nationwide, Jan. 2019-Dec. 2019

Job Openings for Washington DC vs Nationwide

Number of Openings January - December 2019

	Solutions Architect	Cloud Architect	Cloud Network Engineer	Cloud Administrator	Cloud Engineer
DC-MD-VA-WV Region	2,651	1,042	150	172	1,867
Nationwide	32,994	10,444	1,511	1,348	13,053
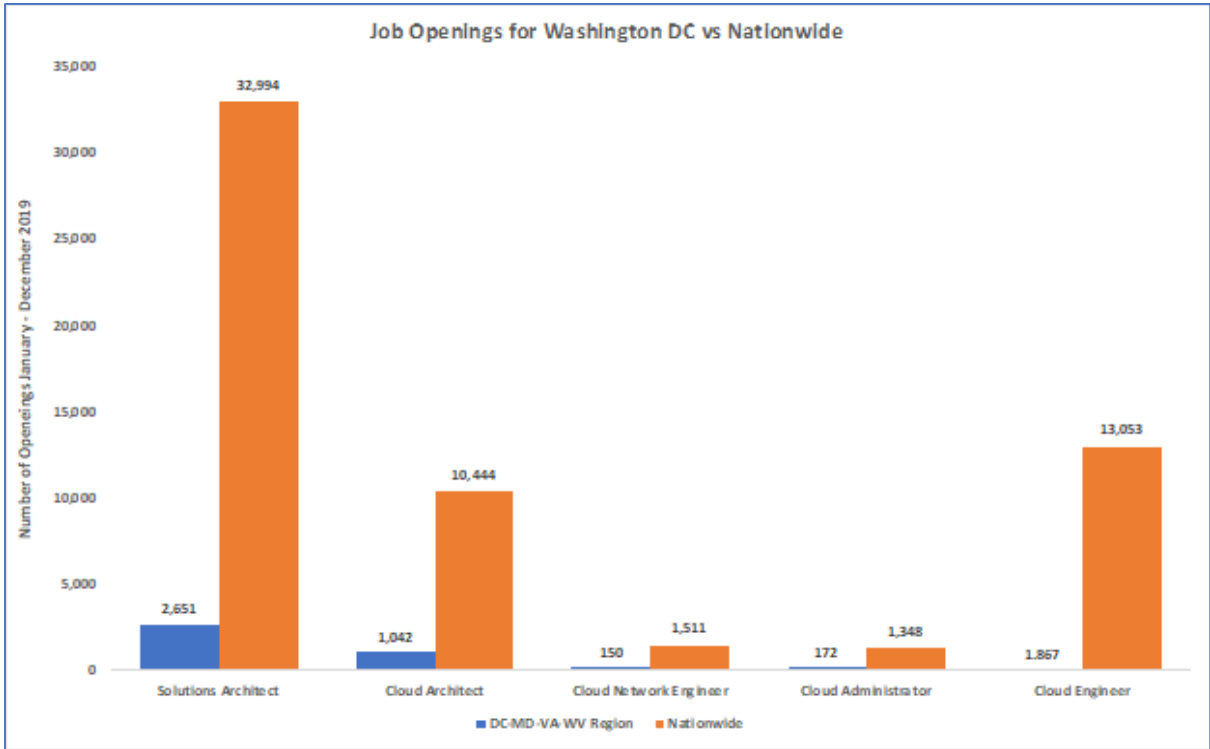
Table 2: Education Level for Job Postings in Jan. 2019-Dec. 2019 (Nationwide)

Educational Level for Cloud Openings

Nationwide Job Postings for January - December 2019

	Solutions Architect	Cloud Architect	Cloud Network Engineer	Cloud Administrator	Cloud Engineer
Associates or Below	439	412	137	57	406
Bachelor	14,848	4691	702	589	6498
Master's or Above	4,491	1,319	122	77	1,276
Unspecified	3,216	4,022	550	625	4,873

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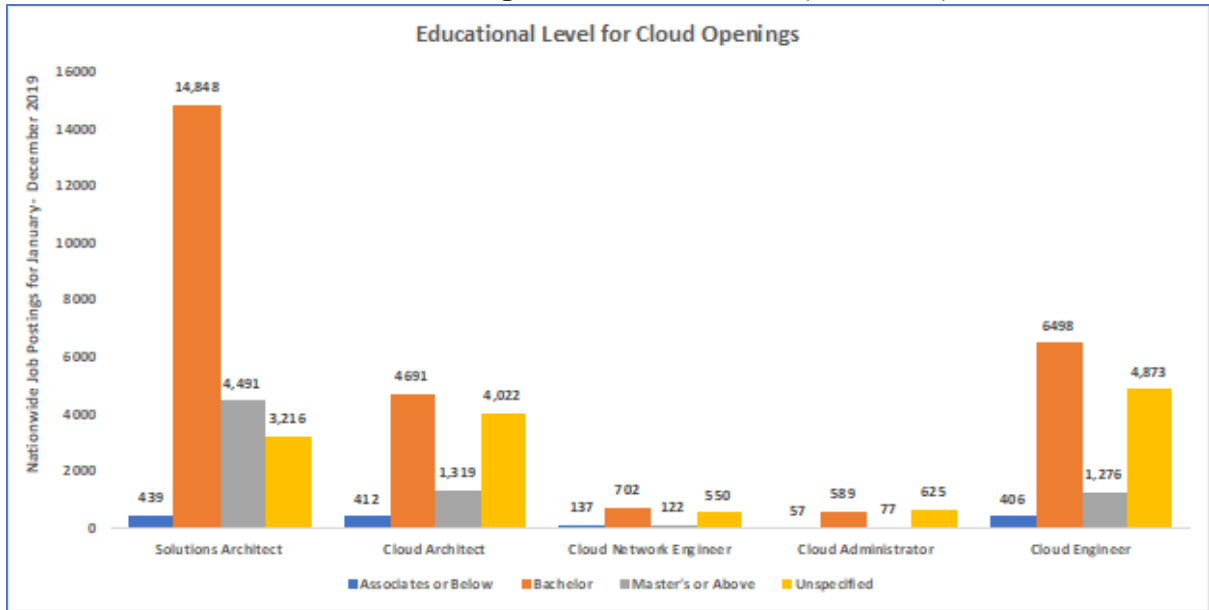
Table 3: Education Level for Job Postings in Jan. 2019-Dec. 2019 (Maryland)

Educational Level for Cloud Openings
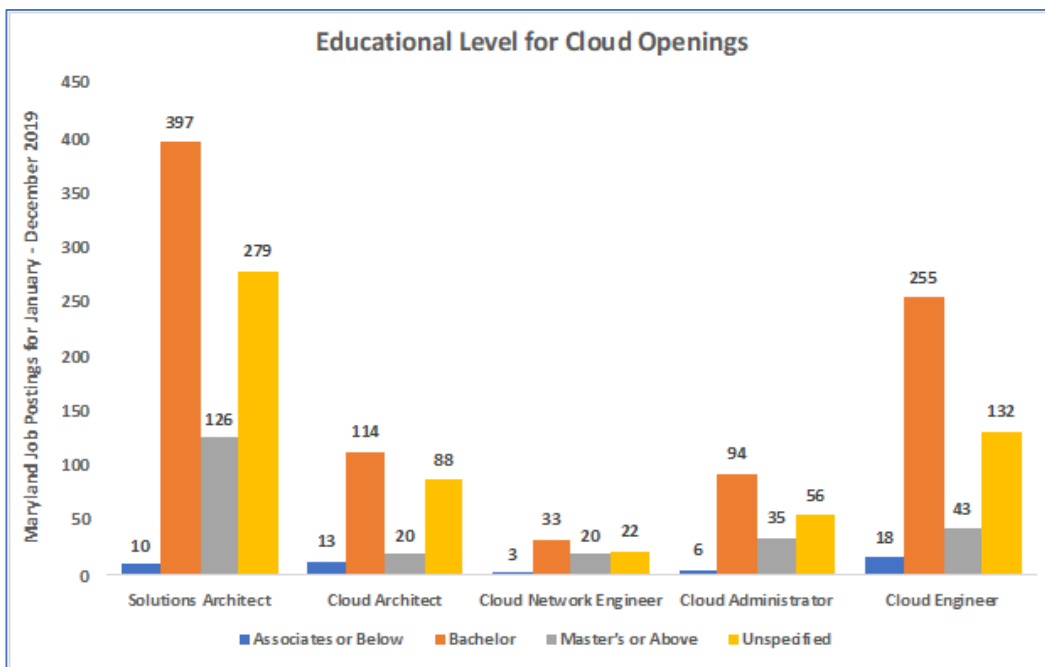
Table 4: Education Levels for Job Postings in Jan. 2019-Dec. 2019 (DC-VA-MD-WV)[6]

Educational Level for Cloud Openings

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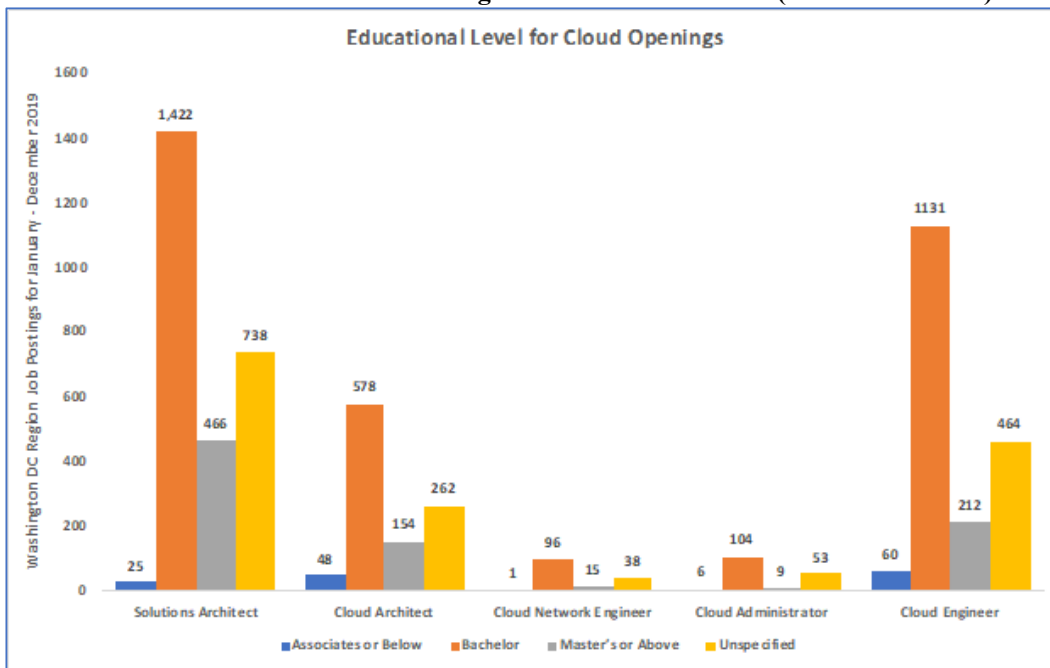
[6] Source: National Center for O*NET Development. Used under the CC BY 4.0 license. Bureau of Labor Statistics

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Forbes reports similar trends:[7] there were 50,248 cloud computing positions in the U.S. in November 2018, with a median salary of $146,350. The report indicates that the demand for cloud computing expertise continues to increase exponentially. The report also indicates that the Washington, DC, region leads the top twenty metro areas that have the most open positions for cloud professionals.

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

Cloud computing is a relatively new program area, and enrollment data from the few institutions[8] that offer the program is limited. UMGC introduced the closely related Master of Science in Cloud Computing Architecture in 2017, which has proved a popular offering for students, with 526 enrollments in 2019 and 672 in 2020 YTD (an increase of 28%). These figures indicate durable prospective student demand.

As an additional data point, CMIT 326 (Cloud Technologies) was offered for the first time in Fall 2020 as an elective in the Cybersecurity undergraduate offerings and enrolled 1,039 students. These numbers show existing demand and promising opportunity for growth in a full cloud degree program and demonstrate need for a Bachelor of Science in Cloud Computing that can provide global, at-scale access to working adults and military-affiliated students in a fully asynchronous online environment.

Based on these trends and indicators, we can safely project 5-year projected enrollment and graduation trends with approximately 25% growth rate as indicated in Table 5, which shows the total projected enrollments broken out between residents and non-residents of Maryland. UMGC's enrollment and degree-production models indicate that nearly 60% of projected enrollments will consistently come from non-residents of Maryland.

Table 5: Enrollment Projections

	Year 1	Year 2	Year 3	Year 4	Year 5
Total Projected Enrollment	50	75	100	125	125
Maryland Residents	21	31	41	51	51
Maryland Non-Residents	29	44	59	74	74

It is anticipated that approximately 50 degrees will be awarded each year, starting in year 6.

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.**

A search for MHEC approved proposals on a bachelor's degree in cloud computing produced a single result. MHEC approved a proposal submitted by Morgan State University in November 2019 to offer a bachelor's degree in Cloud Computing. The UMGC degree will be just the second bachelor's program in the state of Maryland to meet the growing demand for cloud computing degrees in the Washington, D.C., region. Table 6, which compares the programs offered by the two institutions, as well as Section E below, elaborate the complementary but distinct design features of each program that clearly reflect the distinctive missions and mission-driven service to intentionally different student populations.

What the data and discussion in these sections collectively convey is threefold. First, the program design of UMGC's proposed B.S. in Cloud Computing is structurally, temporally, and conceptually distinct from Morgan State's; Morgan's provision of online courses is indeed a means of extending access to their programs, but their institutional approach is not equivalent to architecture of an end-to-end virtual and sustained engagement between the learner and the university that is central to UMGC's delivery of authentic online learning. Second, UMGC's missional imperative to reach students nationally and

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[7]Source:https://www.forbes.com/sites/louiscolumbus/2018/11/27/where-cloud-computing-jobs-will-be-in-2019/?sh=7894e0696add

[8] At this time, only five institutions in the U.S. – and only one in Maryland – advertise a B.S. degree program in cloud. Those institutions are: Western Governor's, Purdue Global, Morgan State, Full Sail, and Colorado State Global (as a specialization).

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globally – a Maryland institution with a state-mandated reach around the world – materially distinguishes this proposed program from Morgan State's historic and critical commitment to lead the state of Maryland in serving underrepresented minority students in STEM disciplines. Third, the vast and growing market demand for the cloud-computing workforce compellingly indicates a need for multiple programmatic options in the state, the nation, and around the world so that students within and beyond the state have quality, Maryland-based choices available to them and do not have to look elsewhere for the right type of cloud-computing program for their career goals and needs. No single institution is going to adequately respond to the scale of this unmet demand. In sum, the increasing gap between job demand and workforce supply constitutes the necessary and justified co-existence of complementary but distinct cloud computing programs offered by Maryland institutions of higher education.

Table 6: Maryland Institutions with Cloud Credential

	UMGC B.S. Cloud Computing Systems	Morgan State University B.S. Cloud Computing
Degree Requirements and Structure (# of credits, a single required sequence vs. electives	The major consists of 11 courses (33 credits) plus related elective courses and general education requirements. The program includes 1 math course, which is used towards the general education requirements. Students can obtain credit for courses in multiple ways: by taking the course, by taking a challenge exam, by portfolio evaluation, or in the case of courses tied to certifications, by holding the unexpired certification addressed by the course.	The Core area of the program consists of 15 courses (51 credits), which are comprised of 15 credits (Math), 24 credits (Computer Science), 3 credits (Business) and 9 credits (Cloud Computing). To complete the major in Cloud Computing, students are also required to take 19 credits from courses drawn from Cloud Computing, Electrical Engineering, Information Science & Systems, Math, and Computer Science
Delivery (onsite vs. online)	Online (asynchronous)	Online (asynchronous) and face-to-face.
Enrollment (full-time vs. part-time)	Over the past five years, approximately 75% of UMGC students registering for classes within the School of Cybersecurity and Information Technology did so on a part-time basis (6 credits per term). We expect this trend to continue.	The MHEC proposal submitted by Morgan State University indicates no part-time students will be enrolled in the program.
Admission Requirements/Target Audience	UMGC is an open enrollment institution. For the in B.S. in Cloud Computing Systems there are no pre-requisite requirements for entry into the program.	Standard Morgan State University application requirements apply: High school students must have a cumulative GPA of 2.0 or higher. GED applicants must earn at least a score of 410 on each section of the HS equivalency exam, and at least a total score of 2250.
Primary Points of Differentiation in Requirements and Target Audience: Morgan's program requires 70 credits of required coursework overall (51 credits in the core, and 19 in required electives), whereas UMGC's requires 33. UMGC offers multiple ways of obtaining credits for courses, including transfer credit from work at previous institutions (most students transfer 30-60 credits when they enroll at UMGC) and credit for unexpired industry certification exams aligned to the program (12 in all). This, coupled with the focused course requirements for the major, may lead to accelerated graduation for career-ready professionals. UMGC's program is also open to full- and part-time students.		

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CIP Code	CIP Code: 11.0902 A program that prepares individuals to design and implement enterprise software systems that rely on distributed computing and service-oriented architecture, including databases, web services, cloud computing, and mobile apps. Includes instruction in data management, distributed and cloud computing, enterprise software architecture, enterprise and cloud security, mobile systems and applications, server administration, and web development.	CIP Code: 11.0103 A program that focuses on the design of technological information systems, including computing systems, as solutions to business and research data and communications support needs. Includes instruction in the principles of computer hardware and software components, algorithms, databases, telecommunications, user tactics, application testing, and human interface design.
Primary Points Differentiation in CIP: UMGC's program is focused on cloud computing systems, aligned to the proposal's focus on career-readiness for cloud professionals. The UMGC program focuses on operations (including security), administration, and management of cloud technology, distinct from software development. Morgan State University's CIP Code indicates a broader focus on technological systems inclusive of but well beyond cloud. Compared to UMGC's, Morgan State's program takes a broader perspective, arising from computer science, where the program is housed and as indicated by required courses in Data Structures, Computer organization, Operating systems, Databases, Software Engineering, and Artificial Intelligence. Each of these is a course with a "COSC" (that is, Computer Science) prefix. The program core (51 credits) is constituted as follows: Computer Science courses (24 credits), Math (15), Cloud (9), Business (3). The elective choices are also dominated by computer science courses (24 courses). These significant structural and conceptual differences in the two programs, combined with the differences in scale and reach of the two institutions' operational orientation, substantially minimize the overlap between the two programs' design and potential student population.		
Pedagogy and Learning Model	The curriculum is based on principles of competency- and performance-based learning. Authentic assessments are embedded throughout; students "learn by doing" through scenario-based projects grounded in real-world situations and problems and using interactive tools and case studies which incorporate applied learning.	
Program Content	The B.S. in Cloud Computing Systems focuses on the needs of an organization including planning, design, security, creation, and maintenance of cloud computing infrastructure. Courses within the program align with leading cloud certifications. These micro credentials (certifications) can be stacked to obtain a certificate (15 credits), which can itself be stacked within the major.	Morgan State's core requirements for the program are dispersed broadly across a range of topics: substantial programming (4 courses, including a course on data structures) and math (4 courses). Primary content on cloud in the core comes from two courses CLCO 261 (Introduction to Cloud Computing), and CLCO 401 (Cloud Application). CLCO 490 is cross listed with COSC 490 as a Senior Project. The electives include two other cloud courses, along with numerous Computer Science (COSC) and math electives. Program information indicates no direct alignment to industry certifications.
Primary Points of Differentiation in Pedagogy/Learning Model and Content: Of the 11 courses in UMGC's major, 8 address cloud directly; the other three directly address cloud-related technology (Networking, Virtualization, and Linux). Content in the UMGC cloud classes is focused on cloud operations, administration, and management. Cloud content in Morgan's program is more broadly dispersed, with the core containing two courses, and two others in the electives. Ten of the 11 UMGC courses in the major directly address cloud-related certifications. Morgan's cloud classes do not indicate a direct alignment to industry credentials in cloud computing. UMGC and Morgan State University take materially different approaches to math and computer science requirements: Morgan's requirements in both areas are extensive and aligned to computer science and information technology curriculum. In UMGC's program, College Algebra is the only required math. Morgan's program includes electives; UMGC's program is structured as a straight-line pathway designed to accelerate time to degree.		

The remaining cloud-computing related credentials in Maryland are offered at the associate degree level or as lower-division or post-baccalaureate certificate programs. Montgomery College offers an associate

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degree. Capitol Technology University offers a post-baccalaureate certificate. Frederick Community College and Montgomery College also offer lower-division certificates.

2. Provide justification for the proposed program.

A globally scalable bachelor's degree in cloud computing directly responds to the large and growing unmet demand for cloud professionals, especially at the bachelor's degree level. Maryland's current undergraduate cloud offerings are not sufficient to close the gap, and UMGC's program is significantly different in structure, intent and scope from that offered by Morgan State. Notably, nearly 60% of students in the school in which the proposed program will be located are either non-Maryland residents or enrolled overseas, which buttresses UMGC's ability to respond to workforce development needs for students both within and beyond Maryland.

In addition, UMGC serves a diverse student demographic – primarily adult learners, active-duty military service members, veterans and other military affiliated students – who rely on UMGC's fully asynchronous, online delivery modality in order to access higher education. UMGC will leverage our global reach to serve students in other geographical locations. In this regard, UMGC is leveraging its global reach in accordance with the statutory mandate and mission that the university be "Maryland's open university, serving working adults, military servicemen and servicewomen and their families, and veterans who reside in Maryland, across the United States, and around the world."[9]

Finally, UMGC's teaching and learning model relies on scholar-practitioner instructors who typically work full-time within their field, and who bring intimate knowledge of workplace needs and practices to the classroom. This approach enhances the workplace relevant, project-based aspects of the curriculum, while connecting students to working professionals in the field.

E.   Relevance to High-demand Programs at Historically Black Institutions (HBIs)
1.   **Discuss the program's potential impact on the implementation or maintenance of high-demand programs at HBIs.**

There is one B.S. program in Cloud Computing offered by Morgan State University.
As discussed above, UMGC's program design reflects the institution's focus on working-adult, military-affiliated student populations. In the School of Cybersecurity and Information Technology, where the B.S. in Cloud Computing will be located, approximately 66% of undergraduate students are military affiliated, of whom approximately 38% are active duty. The average age of the school's student population is 31, and 75% are enrolled part-time. On average, UMGC students transfer 38 credits to the university; 43% of students transfer between 30-59 credits and approximately 36% transfer between 60-89 credits. Moreover, UMGC's global reach means nearly 60% of students in the School of Cyber and Information Technology are either non-Maryland residents or enrolled overseas. Because of this unique student demographic profile, the B.S. in Cloud Computing is designed to respond to the reality that most students enroll t UMGC with the majority of their general education requirements completed and focus primarily on completing program requirements. 74% of UMGC students are working full-time while completing the courses in their major, so information and skills that are often immediately and directly applicable to their current positions are built purposefully into UMGC's Cloud program.

In these contexts, the UMGC program requires 33 credits and is strategically focused on instruction in the management and administration of cloud systems and technologies on all major platforms – including AWS, Microsoft Azure, and Google - and addresses certifications offered by vendor-neutral agencies such as CompTIA and (ISC)[2]. The program requires only college algebra and requires no computer-coding coursework, reflecting our focus on rapid reskilling and upskilling for working adults seeking to advance in or enter the cloud systems management and administration workforce.

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[9] Source: Md. Education Code Ann.§ 13-101(2013)1

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UMGC's program design stands in distinct contrast to Morgan State's program. Morgan's program requires 70 credits (51 credits in the core and 19 credits in required electives), which aligns to the structure of programs primarily designed for a four- to six-year bachelor's degree completion life cycle that is more reflective of primarily full-time students. Morgan's program requires 5 times more credits in math coursework than UMGC's program, and students in Morgan's cloud program are required to take 24 credits in computer science, which aligns with Morgan's research orientation and provides students an appreciable foundation in the broader information technology disciplines (as reflected in the program's CIP code designation, 11.0103). Finally, Morgan's program includes extensive internship experiences designed for more traditional, full-time students who have summers and other extended periods of time to engage in this type of training.

The structural, temporal, and curricular differences in the design of UMGC's and Morgan's programs illustrate distinctive orientations toward remarkably different student populations and will result in a significant variety of program and career choices for students in and outside of Maryland. Given the current market demand and rapid future growth projected in this field, the State will be best served by a diverse array of program offerings in cloud computing to prepare students for the workforce, whether they be entry-level professionals, mid-career professionals, or career changers. Consequently, UMGC's proposed Cloud program will not negatively impact Morgan's Cloud program.

Before submitting this proposal, UMGC academic leadership engaged Morgan State leadership directly with the expressed purpose of understanding the differences between the programs' curriculum design, specifically the intentional curriculum-design and content differences related to the distinct populations of students each institution is optimally designed to serve. UMGC is confident that the high demand for cloud computing professionals in and around the state of Maryland will drive interest in both institutions' mission-driven offerings, and our proposal responds directly to this well-documented market demand that no single institution in Maryland or elsewhere can meet. While it is unfortunate that the two institutions could not agree on this point, UMGC submits this proposal with full confidence in these evidence-based distinctions, and that a complementary space exists in the state for these two Cloud programs.

UMGC's proposal does not present undue harm or unreasonable duplication with Morgan State University. UMGC firmly believes 1) our proposal responds directly to a well-documented market demand that no single institution in Maryland or elsewhere can reasonably supply and, 2) the evidence presented throughout our proposal documents the specific student-type that seeks a UMGC education.

F. **Relevance to the identity of Historically Black Institutions (HBIs)**
   1. **Discuss the program's potential impact on the uniqueness and institutional identities and missions of HBIs.**

   A search of the MHEC inventory of approved academic programs in Maryland indicates that one of the four Historically Black Institutions in Maryland has a potentially related program: Morgan State's B.S. in Cloud Computing. However, as discussed above, Morgan State's program appears to be capaciously constructed in a way that aligns to their unique institutional identity as a "preeminent, public, urban, research institution,"[10] with a curricular focus on computer science and math required for work in technologies and roles within but also well beyond cloud computing. In contrast, UMGC's program reflects the multipronged commitment to serve not only students in Maryland, but also across the U.S., and around the world with rapid upskilling and reskilling education focused on increasing workforce capacity specifically in the management and administration of cloud computing systems and infrastructure. UMGC's program teaches students fundamental aspects of cloud computing (such as networking and virtualization), and then focuses on familiarizing students with cloud technologies provided by leading vendors (AWS, Microsoft, Google, etc.). Students are taught how to leverage these technologies and manage the tools provided by these cloud-computing platforms in order to meet business needs. This knowledge is complemented with security concepts and other competencies drawn

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[10] Source: Morgan State University MHEC proposal.

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from highly regarded vendor-neutral agencies such as CompTIA and (ISC)[2]. The focus in UMGC's proposed program is not on writing code to develop cloud-based applications, an important and appropriate contrast to Morgan State's code-intensive program.

Additionally, Morgan State's program was designed in close and formal collaboration with AWS;[11] UMGC's program includes instruction in AWS (a dominant player in the cloud space) but also purposefully includes instruction in Azure and Google environments as well as vendor-neutral certifying organizations such as CompTIA and (ISC)[2] to ensure the widest applicability of a graduate's education to workforce opportunities in cloud computing.

Access is also part of the design of the curriculum: UMGC has strategically disaggregated the B.S. in Cloud Computing Systems degree so that students can make progress toward professionally leverageable micro-credentials – both industry recognized exam-based certifications and a UMGC transcripted certificate – as they work toward baccalaureate graduation. As an additional indicator of and response to the need for access to upskilling and reskilling in these critical fields, UMGC is also developing complementary non-credit trainings aligned to industry certifications in partnership with multiple leading employers in the U.S. economy. These non-credit trainings are fully stackable within an A.A. or B.S. program and diversify the curriculum pathways by which learners access critical workforce development education.

Finally, this proposed program derives from UMGC's institutional identity, role, and mission and reflects the explicit design, delivery, and support services across the student journey lifecycle, all of which statutorily and missionally distinguish our mission, model, and students from Morgan State's. This mission-driven orientation to UMGC's portfolio also plays out in the stakeholders we serve, most notably the U.S. military. Between now and 2023, the contracts that UMGC holds with the Department of Defense to be a premier provider of educational services to military servicemembers will be up for renewal, and the university's cybersecurity and information technology curricula are critical to this partnership. Similarly, UMGC and the newly launched U.S. Naval Community College (USNCC) recently announced a partnership through which UMGC is a partner institution in providing cybersecurity coursework for USNCC students. Our ability to offer a cloud computing program is imperative to our ability to be responsive to future needs of these students.

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.**

    Like many universities, UMGC began its cloud computing offerings at the master's level with a Master of Science in Cloud Computing Architecture that launched in 2017. Cloud computing was initially viewed as primarily a graduate-level discipline, given the complexity of the content early on in the field's emergence and the variety of techniques and tools utilized in the field. More recently, the adoption of cloud computing and associated concepts, tools, and techniques in all levels of government and the non-profit sector has experienced exponential growth and continues to expand rapidly. This accelerated adoption rate has, in just a few years, created a high-demand market for entry-level jobs in cloud accessible at the bachelor's-degree level, far beyond what any single institution can supply. According to the market research presented in section C, 45% of cloud-computing related positions at the national level will be available to bachelor's degree holders, with 57% requiring a bachelor's degree regionally, and 50% in Maryland requiring a bachelor's degree.

    Accordingly, the curriculum for the B.S. in Cloud Computing Systems incorporates teaching, learning, and assessment strategies that focus on students' development of concrete, job-related knowledge and skills, while reinforcing their understanding of underlying concepts, principles and theories. At the

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[11] Source: Morgan State University MHEC proposal, page 5.

conclusion of each course in the program (except the capstone), students are prepared to take specific and in-demand cloud-related industry certification exams (see Table 7 below). These highly marketable micro-credentials are aligned to job demand and essential to success in the job market. Further, the entire curriculum can be completed in a stackable manner: each course before the capstone can lead to an industry certification, and the first five courses in the program also lead to a stacked credential (the UMGC certificate in Cloud Computing and Networking, submitted in parallel with this proposal) that can be earned before graduation. Finally, because courses are aligned to cloud-related industry certifications, students who come to the program already having earned certifications aligned to the curriculum receive transfer credit for those courses, accelerating time to degree.

Table 7: Alignment of Courses in the program with certifications

Course	Credits	Certification
CMIT 265 (*)	3	CompTIA Network+
CCS 267 (*)	3	VMware Certified Professional
CMIT 291	3	Linux Professional Institute Certification 1 [LPIC-1] and CompTIA Linux+
CMIT 326 (*)	3	CompTIA Cloud+ and AWS Certified Cloud Practitioner
CMIT 336 (*)	3	Microsoft Azure Fundamentals
CCS 346 (*)	3	Google Cloud Engineer - Associate
CCS 356	3	AWS Certified Developer - Associate
CMIT 426	3	AWS Certified Solutions Architect - Associate
CMIT 436	3	(ISC)^2 Certified Cloud Security Professional
CMIT 446	3	AWS Certified SysOps Administrator - Associate
CCS 495	3	N/A
Total	33	

NOTE: The five (*)-ed courses comprise the embedded and stackable certificate in Cloud Computing and Networking.

The proposed program will be overseen within the Department of Cybersecurity and will be managed concurrently with the Master of Science in Cloud Computing Architecture program by the Program Director, Dr. Patrick Appiah-Kubi. Dr. Appiah-Kubit is an AWS Faculty Cloud Ambassador, who is pursuing the AWS Academy Cloud faculty accreditation. He has done extensive research and published several conference and journal papers on cloud computing and has developed and taught several graduate cloud computing courses. He is also a senior member of IEEE and part of the computer society subgroup of the IEEE.

UMGC also has a cohort of faculty who have substantial experience and expertise in the cloud field. Most of them possess certifications such as AWS Certified Cloud Practitioner, AWS Solutions Architect (both Associate and Professional), AWS Certified DevOps Engineer, AWS Certified SysOps Administrator, AWS Certified Developer (Associate), AWS Certified Advanced Networking (Specialty), AWS Certified Security (Specialty), Azure Fundamental, Azure Administrator Associate, Azure Solutions Architect (expert), Azure Security Engineer, CompTIA Cloud+ and CompTIA Certified Cloud Security Professional. UMGC requires that any faculty who teaches a class associated with an IT certification should currently hold that certification.

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

The program consists of 11 courses (33 credits, see Section G.4.) in the major, 14 general education courses (41 credits) and 16 elective courses (46 credits). Some courses will be sequenced, requiring students to take them in a prescribed order.

Program Learning Goals (Objectives) are as follows:

1. Communicate effectively in a variety of contexts utilizing appropriate techniques to convey results.

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2. Evaluate and solve complex issues or problems which require technical and management skills that pertain to cloud computing.
3. Apply quantitative reasoning to analyze data related to business cloud needs, support conclusions, and solve problems that utilizes cloud frameworks.
4. Collaborate with team members to plan, assess and develop appropriate solutions for cloud adoption.
5. Evaluate the cloud infrastructural needs of an organization, analyze cost estimates and value proposition of the cloud utilizing appropriate techniques to provide reasonable solution recommendations to an organization.
6. Propose a network virtualization plan that utilizes cloud services and technologies required to deploy a cloud solution.
7. Design a secure, reliable, scalable and cost-effective cloud-based application utilizing industry-standard methods, models and techniques for a specific cloud project.
8. Design a cloud deployment solution based on architectural design principles, processes and frameworks and customer requirements.
9. Devise a comprehensive compliance, policy and risk assessment plan based on best practices, procedures and processes for the cloud solution to mitigate cloud adoption risk.
10. Create a security strategy for mitigating cloud security risk and threats associated with cloud adoption.

Appendix C shows the mapping of the program learning goals to the core courses in the major.

Five of the first six courses in the B.S. program provide a foundation in the principles, concepts and applications underlying cloud computing systems and comprise a certificate in Cloud Computing and Networking. The Cloud Computing and Networking certificate will be a highly marketable option for students of many majors from all three UMGC schools, and also for new students seeking a quick introduction to the field of cloud computing.

The heart of the program is the set of five courses that follow the courses comprising the certificate. This second set of courses are focused on using selected leading cloud technologies to build and securely manage cloud computing platforms to meet business needs. The culminating course is a capstone which focuses on the integrative application of skills and knowledge acquired throughout the program to solve a complex real-world problem. The skills addressed by the program are threaded throughout the curriculum and were identified through interactions with industry professionals and analysis of market trends and job needs. Courses will use a project-based approach, where learning happens in the context of a project (problem) which integrates institutional learning goals such as critical thinking and writing, and specific program goals.

3. **Explain how the institution will:**
   a) **provide for assessment of student achievement of learning outcomes in the program**
   b) **document student achievement of learning outcomes in the program**

UMGC approaches learning design from an "Understanding by Design" perspective, utilizing a backward design model. This approach begins with identifying the program learning goals that a student will achieve through the program of study. The program learning goals are mapped first to the Degree Qualification Program (DQP) to ensure that the set of learning goals are comprehensive and appropriate for the degree level. In addition, the program learning goals are mapped against UMGC institutional learning goals to validate that the program aligns with the university mission and institutional goals.

Once the program learning goals have been validated through mapping to the DQP and institutional learning goals, the program learning goals are mapped to the courses in the program. This step ensures that all program learning goals are addressed in the curriculum and provide guidance in the development

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of the courses to ensure that each course contributes to the program learning goals without unnecessary duplication of outcomes across courses.

Using the mapping of institutional learning goals to courses, key assignments are identified in courses for use in assessing student achievement of program learning goals. Periodically, a random sample of student artifacts for these identified key assignments are collected and reviewed by faculty to assess how effectively students are meeting the program learning goals.

Using student learning assessment results along with non-direct measures of student learning including student retention and market and labor data, program directors produce an annual review of program quality. For new programs, these annual reviews are integrated into an Academic Program Review including external review after 5 years. After this initial review, programs continue the annual review every year with an Academic Program Review every 7 years.

In November 2020, UMGC licensed AEFIS as its assessment management system. AEFIS will be the central repository for program learning goals, assessment maps, and student artifacts. AEFIS integrates with the D2L LMS to allow student work to be duplicated from the LMS into AEFIS for assessment purposes. This process ensures that assessment review is independent of grades and evaluation within the class and allows for independent review of student work apart from the classroom faculty. AEFIS also holds annual program review reports.

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

The B.S. in Cloud Computing Systems program will consist of 14 general education courses (41 credits), 11 required major courses (33 credits) and 16 elective courses (46 credits).

Below is the list of the 11 required courses. As noted above, students holding any of the industry certifications aligned to the program will receive transfer credit for those courses, accelerating their progress toward the degree.

CMIT 265: Fundamentals of Networking (3)- Designed to help prepare for the CompTIA Network+ certification exam. An introduction to networking technologies for local area networks, wide area networks, and wireless networks. The aim is to recognize the type of network design appropriate for a given scenario. Topics include the OSI (open system interconnection) model, security, and networking protocols. Prerequisite: IFSM 201.

CCS 267: Network Virtualization (3)– Designed to help learners prepare for the VMware Certified Professional exam. Learners will select storage, networking, and hardware options necessary to implement a private cloud solution. They will then install and configure a virtualization tool (such as vSphere) to establish a private cloud solution and manage it. Prerequisite: CMIT 265.

CMIT 291: Introduction Linux (3)- Designed to help prepare for the Linux Professional Institute Certification 1 [LPIC-1] and Linux+ exams. A study of the Linux operating system. The goal is to configure and manage processes, user interfaces, device files, print facilities, file systems, task automation, the boot-up/shutdown sequence, disk storage, network connectivity, system security, users, and groups. Prerequisite: CMIT 202 or CMIT 265.

CMIT 326: Cloud Technologies (3)- Designed to help prepare for the CompTIA Cloud+ and AWS Certified Cloud Practitioner certification exams. A hands-on study of basic cloud technologies. The aim is to apply the techniques and tools used in cloud environments, especially the AWS (Amazon Web Services) cloud. Topics include the global infrastructure of the cloud, deployment and operation in various cloud environments, high availability, scalability, elasticity, security, and troubleshooting. AWS, Microsoft Azure, and Google Cloud are compared. Prerequisite: IFSM 201.

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CMIT 336: Fundamentals of Microsoft Azure (3)- Designed to help prepare for Exam AZ-900: Microsoft Azure Fundamentals. A hands-on study of Microsoft Azure services. The aim is to demonstrate mastery of cloud concepts, the core services used in Azure; pricing and support models used for Azure; and fundamentals of cloud security, privacy, compliance, and trust for Microsoft Azure. Topics include high availability, scalability, agility, fault tolerance, and disaster recovery in the Microsoft Azure environment. Prerequisite: CMIT 326.

CCS 346: Cloud Engineering (3)– Designed to help learners prepare for the Google Cloud Engineer Associate exam. Learners will set up the cloud environment as well as plan, configure, deploy, implement, and operate the deployed solution and security access management on Google Cloud. Prerequisite: CMIT 326.

CCS 356: Application Development and Scripting in the Cloud (3)– Designed to help learners prepare for the AWS Certified Developer Associate exam. Learners will design, develop, and deploy secure server/serverless applications to interact with AWS services using API, SDK and CLI, as well as optimize applications and perform root cause analysis on faults. Prerequisite: CMIT 291.

CMIT 426: Mastering the AWS Cloud (3)- Designed to help prepare for the AWS Certified Solutions Architect - Associate exam. A hands-on study of Amazon Web Services (AWS). The goal is to understand the computing, networking, storage, and database services in AWS; apply best practices in building secure and reliable applications in the AWS cloud environment; and identify the appropriate AWS service to meet an organization's technical requirements. Prerequisite: CMIT 326.

CMIT 436: Security in the Cloud (3)- Designed to help prepare for the (ISC)[2] Certified Cloud Security Professional exam. A hands-on study of cybersecurity and measures for securing critical assets in cloud environments. The goal is to apply the principles of confidentiality, integrity, and availability (CIA) of digital resources in cloud environments. Prerequisite: CMIT 426.

CCS 446: Cloud Administration and Operations (3)– Designed to help learners prepare for the AWS Certified SysOps Administrator Associate exam. Learners will create and maintain metrics and alarms to monitor and report on cloud system performance. Learners will evaluate the availability and resilience of AWS environments and mitigate cloud deployment and operational issues. Prerequisite: CMIT 436.

CCS 495: Capstone: Current Trends and Projects in Cloud Computing (3)– The course is the final course for the major. Learners will complete a compressive, project driven study of cloud design, implementation, operation and monitoring. Learners will integrate knowledge from all previous study in the program and apply to solve a complex real-world cloud problem that meets the needs of an organization. Prerequisite: CCS 446.

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

All UMGC undergraduate students are required to complete 41 credit hours in general education requirements. The general education courses required for the program will consist of:
- Research and Computing Literacy - 7 Credits
- Communication – 12 Credits
- Mathematics – 3 Credits
- Arts and Humanities – 6 Credits
- Behavioral and Social Sciences – 6 Credits
- Biological and Physical Sciences – 7 Credits

See Appendix B for the Bachelor of Science in Cloud Computing Systems Degree Planning Course Sequence Sheet, which includes required major and related courses, and required and recommended General Education courses.

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

    N/A

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

    N/A

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 systems, availability of academic support services and financial aid resources, and costs and payment policies.**

    UMGC maintains a comprehensive website that houses all updated information about its programs. Students will have access to degree requirements, course catalogs, course schedules, and other pertinent information about the program.

    The website also provides specific and clear information about technology requirements for UMGC students, information and training on learning management system, and other additional resources to maximize students' learning experience.

    A variety of support services are available to students for academic assistance (Tutoring, Writing Center), as well as technical support and financial aid.

    UMGC students are guided by the Student Handbook that is available online and serves as a general guide for all current and prospective students.

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.**

    All Bachelor of Science in Cloud Computing Systems program related communications (advertising, recruiting and admission materials) are done in conjunction with UMGC-wide institutional communication strategy which adheres to the principle of truth in advertising. All written and electronic materials prepared for prospective students for purpose of recruitment will accurately and clearly represent the courses, the program, and services available.

H. **Adequacy of Articulation**
1. **If applicable, discuss how the program supports articulation with programs at partner institutions. Provide all relevant articulation agreements.**

    UMGC already has a significant portfolio of articulations with community colleges, both within the state of Maryland and nation-wide in computing and information technology. Some of these community colleges already have programs in cloud computing (for example, the lower-level certificates offered by Montgomery College and Frederick Community College that map into UMGC's upper-level offerings). UMGC has a flexible and convenient transfer policy – accepting up to 70 credits from local community colleges. The university also offers an additional incentive for community college students in the form of a "completion scholarship," whereby students who complete their 2-year degree at a local community college are guaranteed admission to UMGC, and a tuition rate that allows recipients of the scholarship to complete the four-year degree for $12,000 or less. New articulations can easily be created between the proposed B.S. program and the cloud offerings of community colleges, providing community-college

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students a seamless and accelerated, affordable pathway to a four-year degree in cloud computing. These pathways to a four-year degree can also be accelerated because some cloud-related community college courses can be articulated to courses comprising the B.S. program.

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

1.   **Provide a brief narrative demonstrating the quality of program faculty. Include a summary list of faculty with appointment type, <u>terminal degree title and field</u>, academic title/rank, status (full-time, part-time, adjunct) and the course(s) each faculty member will teach in the proposed program.**

UMGC's model employs full-time faculty (known as collegiate faculty) in faculty leadership roles, such as Department Chairs and Program Directors, with responsibility for the overall intellectual coherence and integrity of the program. Other collegiate faculty teach and serve in complementary roles that maintain and support the academic programs, providing input into the design and content of the program and their courses. This core group of full-time collegiate faculty will support the Adjunct faculty in teaching the program courses. Notably, UMGC's School of Cyber and IT, where the proposed Cloud program will be located, recently optimized its organizational structure in order to repurpose am administrative position as an additional collegiate faculty line to support the anticipated growth in the cloud computing area.

In keeping with UMGC's emphasis on workplace relevance, the Bachelor of Science in Cloud Computing Systems teaching faculty will be practicing professionals who teach part-time for UMGC. These adjunct faculty provide instruction for the majority of courses (which is true for all programs at all levels at UMGC). This model is responsible for one of UMGC's greatest strengths: scholar-practitioner faculty who have solid academic credentials and continue to work outside the university, providing a continuous infusion of current workplace knowledge, career relevant perspectives, and maximum flexibility for adapting to changing student demand. In this way, UMGC supports students in a learning experience that is practical and relevant to today's competitive and evolving global marketplace. Many adjuncts have considerable experience with UMGC. Collegiate and adjunct faculty both hold academic rank and title, based on their academic qualifications and professional experience, including teaching experience at UMGC. Since 1996 UMGC has held a MHEC-approved waiver of the Code of Maryland (COMAR) requirements for total credit hours taught by full-time faculty (Appendix A).

The centrality and appropriateness of UMGC's faculty model relative to its educational mandate and mission were reaffirmed by MHEC in a 2016 review of mission statements, as evidenced in the following excerpt from the Commission's report:

> UMUC intentionally seeks highly qualified full-time and adjunct faculty who have hands-on experience in the disciplines they teach and who can leverage that experience to provide a richer learning experience for students. The university's mission to serve adult students is supported by adjunct faculty who are scholar-practitioners engaged daily in their profession. The ability to employ adjunct faculty is critical to UMUC's capacity to quickly deploy academic and continuing education programs in response to workforce-related needs. This entrepreneurship and flexibility in establishing new programs is particularly important to the university: given its history of very limited state support, the university's financial model is based on tuition revenues, and all programs must be self-supporting.[12]

Consistent with this model, UMGC has a substantial roster of faculty with expertise in areas related to Bachelor of Science in Cloud Computing Systems. Teaching effectiveness is monitored by class

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[12] Source: Maryland Higher Education Commission (December 2015), Mission Statement Review: http://mhec.maryland.gov/institutions_training/Documents/acadaff/2016MissionStatementReview.pdf

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observation, student course evaluations, and program-specific, student-level competency assessment. The School of Cybersecurity and Information Technology already has an active unit of faculty qualified and prepared to teach courses in the proposed program and we constantly recruit additional faculty.

The following is a partial list of faculty and their graduate degree title(s), academic title/rank, and the courses they will teach:

Table 8: Faculty who will teach courses in the B.S. in Cloud Computing Systems

Name	Appointment Type and Rank	Terminal Degree and Field	Status	Course(s) to be Taught
Patrick Appiah-Kubi	Program Director of Cloud Computing and Networking, Collegiate Associate Professor	PhD, Information Technology	Full-time	CMIT 265 CMIT 326 CCS 495
John Galliano	Program Director of Cybersecurity Technology, Collegiate Associate Professor	DIA, Computer and Information Systems Security	Full-time	CMIT 265 CMIT 326
Manish Patel	Collegiate Associate Professor	MBA, Management Information Systems	Full-time	CMIT 291
TBD	Collegiate Faculty		Full-time, beginning ~July 2021	
Marcus Winkfield	Adjunct Assistant Professor	PhD, Information Systems	Part-time	CMIT 326 CMIT 336 CMIT 426
Samuel Bunmi	Adjunct Assistant Professor	PhD, Information Assurance and Cybersecurity	Part-time	CMIT 326 CMIT 426 CMIT 436
Nancy Landreville	Adjunct Professor	PhD, Information Technology	Part-time	CCS 267
Stephen Orr	Adjunct Associate Professor	PhD, Computer Science	Part-time	CMIT 265 CMIT 326
Cliff Davis	Adjunct Assistant Professor	MS, IT Management	Part-time	CCS 446 CCS 346
Leo Aguilera	Adjunct Assistant Professor	MS, Computer Science	Part-time	CCS 356

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**

UMGC is committed to providing pedagogy training in support of student learning throughout the faculty life cycle with the institution. FACDEV 411, our required New Faculty Academic Orientation, is a two-week, facilitated online class that covers the history of UMGC, pedagogy of adult learning, facilitating online learning, and providing additional support for students through UMGC's Library, Effective Writing Center, and Office of Accessibility Services. Parallel required training courses exist for faculty teaching hybrid courses and faculty teaching in our competency-based curriculum model.

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In addition, faculty members have access to just-in-time professional development opportunities such as our bi-monthly webinars; self-paced workshops on pedagogical and LMS-related matters; quick guides on online classroom support and technology; and a variety of Skillsoft courses.

b)   The learning management system

UMGC provides multiple touchpoints to ensure thorough orientation to and continued education about our LMS, Desire2Learn. Building on the materials provided in FACDEV 411, UMGC offers workshops on grading strategies; the integration of audio and video feedback to students; gradebook setup and rubrics; crafting powerful introductions; open educational resources (OERs) used in the classroom; and netiquette.

In addition, many webinars directly amplify the skills needed by faculty members to be successful in the online classroom, e.g., recursive feedback; scaffolding student learning; digital literacy; classroom assessment techniques; creating a more engaging classroom; etc.

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

Besides the strategies outlined above, UMGC has recognized the need to equip faculty more comprehensively with skills and abilities to enhance engagement and coaching, in order to enhance student learning and retention.

To that end, UMGC has developed a coaching training which will be made available to all UMGC faculty (including faculty teaching this program) in February 2021.This course, FACDEV 111—Coaching and Providing Feedback that Matters—will provide coaching skills to create an active and motivating presence in the classroom in order to establish helpful and supportive relationships with each student leading to persistence and academic success.

This addition our training catalog will diminish the distance between faculty and students inherent in online courses by facilitating regular interaction and outreach and personalized and actionable coaching and feedback.

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

Describe the library resources available and/or the measures to be taken to ensure resources are adequate to support the proposed program.

No new library resources are needed to serve the Bachelor of Science in Cloud Computing Systems program. The UMGC Library provides access to a vast array of library resources and services to UMGC students, faculty, and staff worldwide to meet their academic needs and includes a wide and varied collection of journal articles, reports, case studies, and, in some instances, complete books available electronically via a comprehensive selection of online library databases. Library services include instruction, reference, electronic reserves, and document delivery for materials not otherwise available in the library databases. The UMGC Library relies on distributed technology as its primary mechanism to provide online access to resources and services to UMGC's widely dispersed, working-adult student population.

The curated collection of online academic research databases available to UMGC faculty and students provides access to hundreds of thousands of full-text articles as well as reports, statistics, case studies, book chapters, and complete books in a wide range of subject areas. In addition, students have access to the full text of dissertations and theses via the *ProQuest Dissertations and Theses* database. The Library assists faculty and learning designers in providing links to Library materials directly in online classes.

The UMGC Library also offers other resources and services. UMGC students, faculty, and staff within the continental United States have access to more than ten million volumes in print from the 16-member University System of Maryland and Affiliated Institutions (USMAI) library consortium. The UMGC

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Library offers document delivery services to all UMGC students, faculty, and staff worldwide for a variety of materials, including journal articles and book chapters. UMGC's expanding collection of 75,000 electronic books (e-books) has significantly increased the ability to meet the needs of UMGC's global population.

The UMGC Library provides faculty and students with research assistance in creating search strategies, selecting relevant databases, and evaluating and citing sources in a variety of formats via its *Ask a Librarian*, which includes 24/7 chat and email. A guide to locating scholarly articles and using UMGC's library databases. The UMGC Library *OneSearch* tool allows users to simultaneously search for scholarly articles, books, and/or other research resources via a single search engine in most of the databases to which the UMGC Library subscribes, either directly or as additional resources.[13] In addition, UMGC faculty can request customized library instruction sessions for both on-site and online classes, and can also add UMGC Library tutorials and materials to their learning management system classrooms and refer students to them through the Web gateway.

A librarian liaison assigned to each academic department assists faculty with resource identification and other program needs. The Subject Guides area of the library's web site provides a listing of resource guides for each subject area, with each guide containing relevant databases, Web sites, books, and other resources along with technical and citation assistance.

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.

Existing resources related to facilities, infrastructure, and equipment are adequate to meet the Bachelor of Science in Cloud Computing Systems program needs. The proposed Bachelor of Science in Cloud Computing Systems will primarily be offered online asynchronously through a distance-education platform.

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

UMGC has an internal email network that provides all incoming students and all faculty with consistent email domains @student.umgc.edu and @faculty.umgc.edu respectively. Students are encouraged but not limited to using this email address in all their communication with the university. Faculty are required to use their UMGC addresses for all their official UMGC communications.

UMGC's standard learning management system is Desire2Learn (D2L). All UMGC classes are taught using this system and all the students with appropriate technology and online access (referenced in section G8) have access to this system through their learning portal.

Support is available for students and faculty through a 24/7 help desk and a large variety of online help resources on UMGC's website.

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

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[13] Source: UMGC Library, 2020: http://sites.umgc.edu/library/index.cfm

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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.

Narrative Rationale
No new general funds are required for implementation of this program. The financial table that follows is based only on students entering the new program.

As shown in Tables 1 and 2 below, the program is expected to be self-supporting from Year 2 onward. If necessary, resources will be reallocated from the course development fund to support the new program in year one. Regarding expenditures, UMGC's existing base of FTE faculty and administrative and support staff will be redirected to support and serve the Bachelor of Science in Cloud Computing Systems.

TABLE 1:RESOURCES					
Resource Categories	Year1	Year2	Year 3	Year4	Year 5
1. Reallocated Funds	0	0	0	0	0
2. Tuition/Fee Revenue (c + g below)	$450,000	$675,000	$900,000	$1,125,000	$1,125,000
a. Number of F/T Students	0	0	0	0	0
b. Annual Tuition/Fee Rate	N/A	N/A	N/A	N/A	N/A
c. Total F/T Revenue (a x b)	N/A	N/A	N/A	N/A	N/A
d. Number of P/T Students	50	75	100	125	125
e. Credit Hour Rate*	$300	$300	$300	$300	$300
f. Annual Credit Hour Rate	30	30	30	30	30
g. Total PIT Revenue (d x e x f)					
3. Grants, Contracts & Other External Sources	0	0	0	0	0
4. Other Sources	0	0	0	0	0

	$450,000	$675,000	$900,000	$1,125,000	$1,125,000
TOTAL (Add 1 - 4)					

* only instate tuition is considered

2. **Complete Table 2: Program Expenditures 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 expenditure category.**

Narrative Rationale
The data below for faculty, staff, and technical support and equipment is based on UMGC's existing base of FTE faculty and administrative and support staff who will be utilized to support and serve the Bachelor of Science in Cloud Computing Systems, as well as existing technical support and equipment.

In category 1.b, the adjunct faculty salary is the median salary for an adjunct associate faculty member with a terminal degree at longevity step 11. In category 7, the expenditure listed is for course development.

TABLE 2: PROGRAM EXPENDITURES:					
Expenditure Categories	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**
1. Faculty (b + c below)	$80,697.06	$121,045.60	$161,394.10	$201,742.70	$201,742.70
a. Number of FTE sections	18	27	36	45	45
b. Total Salary (Adjunct salary at $1371 per credit hours)	$74,034	$111,051	$148,068	$185,085	$185,085
c. Total Benefits (9%)	$6,663.06	$9994.59	$13,326.12	$16,657.65	$16,657.65
2. Admin. Staff (b + c below)	$246,600	$246,600	$246,600	$246,600	$246,600
a. Number of FTE	2	2	2	2	2
b. Total Salary	$180,000	$180,000	$180,000	$180,000	$180,000
c. Total Benefits (37%)	$66,600	$66,600	$66,600	$66,600	$66,600
3. Support Staff (b + c below)	$34,250	$34,250	$34,250	$34,250	$34,250
a. Number of FTE	.5	.5	.5	.5	.5
b. Total Salary	$25,000	$25,000	$25,000	$25,000	$25,000
c. Total Benefits (37%)	$9250	$9250	$9250	$9250	$9250
4. Technical Support and Equipment	$80,000	0	0	0	0

5. Library	0	0	0	0	0
6. New or Renovated Space	0	0	0	0	0
7. Other Expenses (course development, marketing)	$100,000	0	0	0	0
TOTAL (Add 1 – 7)	$541,547.06	$401,895.59	$442,244.12	$482,592.65	$482,592.65

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.

UMGC has created an annual program review process that includes assessment of student learning as described earlier along with non-direct measures of student learning including student course evaluations, student retention and graduation rates, and student program surveys administered in capstone courses. As part of this process, external data is collected, including enrollment in related programs at other institutions and trends in labor markets. UMGC's mission for career relevant education requires that program learning goals and curriculum are maintained in the context of changing needs in labor markets and required skills for graduates.

As part of the annual program review, courses within the program portfolio are reviewed for course health. This includes student success rates within courses and course reenrollment rates (how many students in a course re-enroll in the following term). In addition, student course evaluations are administered every term for every course. Data are aggregated in academic dashboards at the course level to allow faculty to evaluate the effectiveness of course curriculum and delivery. When a course is scheduled for revision, faculty teaching the course are surveyed to provide input to the faculty and instructional designers revising the course.

UMGC is in the process of adopting Quality Matters for course evaluation. As that process rolls-out, courses will be reviewed on a regular basis against the Quality Matters rubric to further ensure quality of course materials and design.

Full-time faculty are reviewed at least every two years. Part-time faculty are reviewed on a course/semester basis. The student course evaluation provides an opportunity for faculty to receive both quantitative and qualitative feedback on their teaching.

   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.

Faculty, administrators, and the Office of Academic Quality collaborate to implement and monitor assessment activities, review results, and make appropriate resource, curriculum, or other modifications. Annually, student performance across learning demonstrations is evaluated to determine where improvements may be required. Changes are made to curriculum and/or student support models. The process supports a continuous cycle of improvement.

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Additional evaluation includes tracking of student retention, grade distributions and cost-effectiveness. Regular academic program reviews consider all factors related to academic quality, curriculum currency and relevance, student support and adequacy of facilities.

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.

UMGC seeks to reflect the diversity of the global community it serves. Cultural differences are recognized, valued, and considered essential to the educational process. UMGC provides an academic environment in which diversity is not only articulated as one of the institutional core values but is reflected in the university's ethnically and racially diverse student body and its proven record of providing higher education access to minority students. The university's Digital Teaching and Learning unit collaborates with UMGC's Office of Diversity and Equity to ensure a robustly inclusive curriculum that is built around UMGC's focus on project-, scenario-, and problem-based learning, which learning science has shown to more adequately respond to the learning approaches most effective for adult students. Additionally, the School of Cybersecurity and Information Technology is undertaking a focused initiative, in collaboration with the Office of the Chief Digital Officer, to specifically enhance inclusion in the School's offerings, starting with the diversity of perspectives and identities reflected in the projects that anchor the School's curriculum.

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.**

N/A

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

University of Maryland Global Campus has been approved to offer distance education by the Middle States Commission on Higher Education (MSCHE) and maintains compliance with COMAR 13B.02.03.22. UMGC is approved to offer distance education as an alternative delivery method included within its scope of accreditation, as evidenced in the university's MSCHE Statement of Accreditation Status. Furthermore, among its many recognitions, as of 2016 UMGC had received five Sloan Consortium (now Online Learning Consortium) Excellence Awards for online program quality and three IMS Global Learning Consortium awards for technology integration in the classroom environment.

Historically, UMGC was an early provider of off-campus educational opportunities for students and one of the first universities in Maryland to develop online education. UMGC has been a leader among public institutions in providing quality and affordable online education and has been providing distance education to residents of the state of Maryland, to the nation's service members, and to those who live outside of Maryland for more than seventy years. Additionally, UMGC's Europe and Asia divisions offer hybrid and onsite classes to fulfill contract requirements and meet the needs of military students overseas. Stateside, all onsite classes, with the exception of an occasional accelerated offering, are in hybrid format, blending onsite and online delivery.

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UMGC's distance education offerings, including the DMCCPA, are in compliance with <u>C-RAC's 2011 Guidelines</u>.

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Appendix A

90.2.1.001

CC: LEL
Bob J.

Robert L. Ehrlich, Jr.
Governor

Michael S. Steele
Lt. Governor

John J. Oliver, Jr.
Chairman

Calvin W. Burnett
Secretary of Higher Education

MHEC
Creating a state of achievement

MEMORANDUM

DATE: January 6, 2005

Office of the Provost
UMUC

TO: Dr. Nicholas H. Allen
          Provost and Chief Academic Officer, UMUC

JAN 1 0 2005

FROM: Michael J. Kiphart, Ph.D. *MJK*
          Assistant Secretary for Planning and Academic Affairs

SUBJECT: UMUC Waiver of Full-Time Faculty and Library/Learning Resources Center

According to our records, UMUC's request for a waiver of full-time faculty and library/learning resource center went before the Education Policy Committee on January 16, 1996. The Education Policy Committee approved for the University a waiver of the definition of full-time faculty and library/learning resource center as provided for in the Commission's *Minimum Requirements for Degree-Granting Institutions,* and further, that the Commission instruct the Secretary of Higher Education to review the University at regular intervals to assure that the University was in compliance with the applicable provisions of the waiver to the minimum requirements.

On February 15, 1996, the matter went before the Commission and an amended recommendation was approved. The Commission approved for the University a waiver of the requirements for total credit hours taught by full-time faculty and for a waiver of the requirements for a minimum library collection for the Library/Learning Resource Center as provided for in the Commission's *Minimum Requirements for Degree-Granting Institutions.* Further, the Commission instructed the Secretary of Higher Education to review the University at regular intervals to assure that the University was in compliance with the applicable provisions of the waiver to the minimum requirements. The Commission also approved a recommendation that the Faulty Advisory Council and Student Advisory Council recommendations be referred to the University of Maryland System Board of Regents.

Enclosed are documents supporting the approval of the waiver. Should you require additional assistance, please contact David Sumler, Director of Academic Affairs – Planning and Policy, at 410-260-4533 or dsumler@mhec.state.md.us.

MJK:aaw
Enclosures

RECEIVED
APR 30 1996
By VCAA

Parris N. Glendening
Governor

Edward O. Clarke, Jr.
Chairman

Patricia S. Florestano
Secretary of
Higher Education

April 23, 1996

rc: a-filed

Forward many for appropriate action

Mr. Lance W. Billingsley, Esq.
Chairman, Board of Regents
University of Maryland System
3300 Metzerott Road
Adelphi, MD 20783

RECEIVED

APR 29 1996

OFFICE OF THE CHANCELLOR
THE UNIVERSITY OF MARYLAND
SYSTEM

Dear Mr. Billingsley:

At its February 15, 1996 meeting, the Maryland Higher Education Commission considered a request by University of Maryland University College for a waiver of the Commission's minimum requirements in the area of full-time faculty and library resources. The Commission has granted the waiver.

In the discussion of the waiver and related issues, both the Faculty Advisory Council and the Student Advisory Council to the Commission raised issues which the Commission felt were more appropriately addressed by the University of Maryland's governing board. Therefore, I am forwarding to you the resolutions submitted to the Commission by these two advisory councils, in addition to the relevant materials considered by the Commission in granting the waivers.

Consistent with the final recommendations of the Commission on this matter, I would appreciate a review of these issues by the Board of Regents. I would also appreciate receiving the results of that review when it is completed. Since the academic year is coming to a close, I realize that any reaction on the part of the Board of Regents may be delayed until next fall. In light of that schedule, could you please supply the Commission with the Board of Regents' position by November 1, 1996.

Sincerely,

Edward O. Clarke, Jr. (CT)

Edward O. Clarke, Jr.
Chairman

EOC:PSF:JAS:ds

Enclosures

cc: Dr. Patricia S. Florestano
        Dr. Donald N. Langenberg

16 Francis St., Annapolis, MD 21401-1781 ▌ (410) 974-2971 ▌ FAX (410) 974-3513
TTY for the Deaf: (800) 735-2258

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Appendix B
UMGC Cloud Computing Systems Degree Planning Course Sequence Sheet
Bachelor of Science in Cloud Computing Systems

This sheet is designed to give an overview of the bachelor's degree requirements at UMGC. Every student's plan is unique to them based on their previous education. For full course descriptions and an overview of all requirements, please refer to the current UMGC catalog. A minimum of 30 credits must be earned at UMGC including at least half of the major/minor; 36 credits must be upper level including half of the credit in the major/minor. Please contact UMGC with all questions in regard to your official degree plan. Degree requirements may change based on the date of initial enrollment at UMGC.

Program	Course Sequence	Recommended Course	Level	Course Note	Alternative Course(s)
Cloud Computing Systems	1	LIBS150 (1)	GE	Recommended Research Gen Ed	CAPL 398A
	2	PACE111 (3)T	GE	Required Research Gen Ed	Any PACE 111
	3	WRTG111 (3)	GE	Recommended Communication Gen Ed	Any other WRTG
	4	IFSM201 (3)	GE	Required Computing Gen Ed; Pre-req to Major	N/A
	5	NUTR100 (3)	GE	Recommended Bio/Phys Sci Gen Ed	Any other ASTR, BIOL, CHEM, GEOL, NSCI, NUTR, or PHYS
	6	CMIT265 (3)	Major	Required Major Course	N/A
	7	SPCH100 (3)	GE	Recommended Communication Gen Ed	Any other WRTG/SPCH/COMM
	8	MATH 107 (3)	GE	Required Math Gen Ed	N/A
	9	WRTG112 (3)	GE	Required Communication Gen Ed	N/A
	10	CCS 267 (3)	Major	Required Major Course	N/A
	11	HIST125 (3)	GE	Recommended HU/Arts Gen Ed	Any other ARTH, ARTT, ASTD, ENGL (except ENGL 281 and ENGL 384), GRCO, HIST, HUMN, MUSC, PHIL, THET, dance, literature, or foreign language
	12	BIOL103 (4)	GE	Recommended Bio/Phys Sci Gen Ed with required LAB	Any other ASTR, BIOL, CHEM, GEOL, NSCI, NUTR, or PHYS with LAB
	13	BEHS103 (3)	GE	Recommended Beh/Soc Sci Gen Ed	Any other AASP (201 only), ANTH, ASTD, BEHS, CCJS (100, 105, 350, 360, 461 only), ECON, GEOG, GERO (except 342 and 351), GVPT, PSYC, SOCY, or WMST (200 only)

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	14	ARTH334 (3)	GE	Recommended HU/Arts Gen Ed	Any other ARTH, ARTT, ASTD, ENGL (except ENGL 281 and ENGL 384), GRCO, HIST, HUMN, MUSC, PHIL, THET, dance, literature, or foreign language
	15	Elective (3)	Elective	Elective	
	16	ECON103 (3)	GE	Recommended Beh/Soc Sci Gen Ed	Any other AASP (201 only), ANTH, ASTD, BEHS, CCJS (100, 105, 350, 360, 461 only), ECON, GEOG, GERO (except 342 and 351), GVPT, PSYC, SOCY, or WMST (200 only)
	17	CMIT 291 (3)	Major	Required Major Course	N/A
	18	Elective (3)	Elective	Elective	
	19	CMIT 326 (3)	Major	Required Major Course	N/A
	20	Elective (3)	Elective	Elective	
	21	CMIT 336 (3)	Major	Required Major Course	N/A
	22	CCS 346 (3)	Major	Required Major Course	N/A
	23	CCS 356 (3)	Major	Required Major Course	N/A
	24	WRTG393 (3)	GE	Recommended Communication Gen Ed	Any other Upper-level WRTG
	25	Elective (3)	Elective	Elective	
	26	CMIT426 (3)	Major	Required Major Course	N/A
	27	Elective (3)	Elective	Elective	
	28	Elective (3)	Elective	Elective	
	29	CMIT436 (3)	Major	Required Major Course	
	30	Elective (3)	Elective	Elective	
	31	Elective (3)	Elective	Elective	
	32	CCS 446 (3)	Major	Required Major Course	
	33	IFSM 461 (3)	Elective	Recommended Elective	
	34	Elective (3)	Elective	Elective	
	35	Elective (3)	Elective	Elective	
	36	Elective (3)	Elective	Elective	
	37	Elective (3)	Elective	Elective	
	38	Elective (3)	Elective	Elective	
	39	Elective (3)	Elective	Elective	
	40	CCS495 (3)	Major	Required Major Course	N/A

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	41	Elective (1)	Elective	Elective	

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Appendix C
Mapping of Program learning Goals for the B.S. program to core courses in the major

Program Learning Goals	CMIT 265	CCS 267	CMIT 291	CMIT 326	CMIT 336	CCS 346	CCS 356	CMIT 426	CMIT 436	CCS 446	CCS 495
Communicate effectively in a variety of contexts utilizing appropriate techniques to convey results	x	x	x	x	x	x	x	x	x	x	x
Evaluate and solve complex issues or problems which require technical and management skills that pertain to cloud computing	x	x	x	x	x	x	x	x	x	x	x
Apply quantitative reasoning to analyze data related to business cloud needs, support conclusions, and solve problems that utilizes cloud frameworks	x	x	x	x	x	x	x	x	x	x	x
Collaborate with team members to plan, assess and develop appropriate solutions for cloud adoption	x	x	x	x	x	x	x	x	x	x	x
Evaluate the cloud infrastructural needs of an organization, analyze cost estimates and value proposition of the cloud utilizing appropriate techniques to provide reasonable solution recommendations to an organization				x	x	x					x
Propose a network virtualization plan that utilizes cloud services and technologies required to deploy a cloud solution	x	x	x								x
Design a secure, reliable, scalable and cost-effective cloud-based application utilizing industry-standard methods, models and techniques for a specific cloud project							x			x	x
Design a cloud deployment solution based on architectural design principles, processes and frameworks and customer requirements							x	x		x	x
Devise a comprehensive compliance, policy and risk assessment plan based on best practices, procedures and processes for the cloud solution to mitigate cloud adoption risk						x		x	x	x	x
Create a security strategy for mitigating cloud security risk and threats associated with cloud adoption									x	x	x
Develop an administrative, monitoring, maintenance, auto-scaling and configuration plan for the cloud solution				x	x	x					x

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UNIVERSITY SYSTEM
of **MARYLAND**

TOPIC: University of Maryland Global Campus: Bachelor of Science in Data Science

COMMITTEE: Education Policy and Student Life

DATE OF COMMITTEE MEETING: Friday, March 5, 2021

SUMMARY: The Bachelor of Science (B.S.) in Data Science program aligns with the needs of employers via competency and project-based teaching and learning approaches, providing employment-ready skills in the configuration and application of data science. The program is designed in a straight line path to provide critical, foundational knowledge of the analysis of large-scale data sources from the interdisciplinary perspectives of applied statistics, computer science, data storage, and data representation and modeling, with the purpose of getting insights from data and making strategic data-driven recommendations that influence organizations' outcomes. The curriculum incorporates teaching, learning, and assessment strategies that focus on students' development of concrete, job-related knowledge and skills while reinforcing their understanding of underlying concepts, principles and theories. The program aligns with the Association for Computing Machinery (ACM) Undergraduate Data Science Curriculum Recommendations.

UMGC will offer this program in an asynchronous, online format that allows students who are unable to attend a campus-based program access to education in this emerging field. UMGC's network of educational sites in Europe, Asia, and the US also allows service members access to courses that can be applied to this program while they are stationed in military bases around the world. Additionally, UMGC's program is designed to maximize transfer-credit acceptance from community colleges and workplace learning to assist with progress towards a credential.

ALTERNATIVE(S): The Regents may not approve the program or may request further information.

FISCAL IMPACT: No additional funds are required. The programs can be supported by the projected tuition and fees revenue.

CHANCELLOR'S RECOMMENDATION: That the Education Policy and Student Life Committee recommend that the Board of Regents approve the proposal from University of Maryland Global Campus to offer the Bachelor of Science in Data Science.

COMMITTEE RECOMMENDATION:	DATE: March 5, 2021
BOARD ACTION:	DATE:
SUBMITTED BY: Joann A. Boughman 301-445-1992	jboughman@usmd.edu

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**UNIVERSITY OF MARYLAND
GLOBAL CAMPUS**

OFFICE OF THE CHIEF ACADEMIC OFFICER

January 28, 2021

Jay A. Perman, MD
Chancellor
University System of Maryland 3300 Metzerott Road
Adelphi, MD 20783

Dear Chancellor Perman:

On behalf of the University of Maryland Global Campus (UMGC), this letter serves as official request for a new bachelor's degree program in Data Science. (HEGIS: 07.0301 CIP: 30.7001). In accordance with COMAR 13B.02.03, the following proposal is submitted for your review.

As noted in this proposal, UMGC plans to offer an undergraduate certificate in Business Analytics that is embedded within this bachelor's degree program. A proposal for that certificate has also been submitted for your review.

Payment for review of this new academic program has been made to MHEC via R*STARS interagency fund transfer, transaction number JAIA0860, in the amount of $850 in accordance with the MHEC fee schedule.

Sincerely,

Blakely R. Pomietto, MPH
Senior Vice President and Chief Academic Officer

CC: Antoinette Coleman, Associate Vice Chancellor for Academic Affairs, University System of Maryland

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A.   **Centrality to Institutional Mission and Planning Priorities:**
   1.   **Provide a description of the program, including each area of concentration (if applicable), and how it relates to the institution's approved mission.**

Consistent with the institutional purpose as stipulated by State statute (Md. Education Code Ann.§ 13-101(2013)1), the mission of UMGC is improving the lives of adult learners. UMGC will accomplish this by:

   (1)   Operating as Maryland's open university, serving working adults, military servicemen and servicewomen and their families, and veterans who reside in Maryland, across the United States, and around the world;
   (2)   Providing our students with affordable, open access to valued, quality higher education; and
   (3)   Serving as a recognized leader in career-relevant education, embracing innovation and change aligned with our purpose and sharing our perspectives and expertise.

Each facet of UMGC's mission has direct bearing on the programs the university offers and how those programs are designed and delivered. By mission and state mandate, every aspect of the UMGC student experience is designed from its origins for working-adult and military-affiliated students to access online education and built to leverage our unique and longstanding expertise in designing online learning. The learning resources, the selection, training, and evaluation of faculty, the non-academic supports, the success-coach advising model, the virtual classroom, the academic resources, the term and session structure, and course length are all deliberately derived from adult-learning science in distributed, online modalities, and the learning ecosystem is designed for a learner experience taking place anywhere in the world. These students' demographic profile drives the design and delivery of our learning model: The average age of UMGC's undergraduate student is 33 years old, 75% of them work full-time, and 46% have dependent children. For these students, their often-complicated life circumstances while pursuing higher education means they need and benefit most from the authentic online education that UMGC has delivered for more than two decades.

Authentic online education is fundamentally different from courses and programs originating at traditional institutions and taught remotely in the same way as face-to-face classes. Instead, authentic online education is a distinctive educational architecture intentionally designed for virtual teaching, learning and assessment, with technology tools strategically deployed for engagement and outcomes, as well as wraparound services that provide support throughout the online student life cycle. These features set UMGC apart in the higher education landscape of Maryland.

Our history and expertise have allowed us to build strong relationships with the military community which is nothing less than part of UMGC's institutional identity. As of Fall 2020, 65% of UMGC's undergraduate students are military affiliated, including active duty servicemembers, their families, and Veterans. This dimension of UMGC's identity is a particular point of pride, beginning with the university first sending faculty overseas in 1949 to teach America's soldiers on military installations in Europe. The relationship between UMGC and the military has grown ever stronger in the decades since as a result of our intentional program design and delivery model that meets adult learners *where they are,* whether through asynchronous online courses or on military bases in Germany, Italy, Japan, Korea, Guam, Colorado, Virginia, and many other military facilities around the world.

Today UMGC holds competitively awarded contracts from the U.S. Department of Defense (DOD), under which we serve military servicemembers in Europe, Asia, and the Middle East, delivering specifically solicited programs of study identified by the DOD as responsive to the training, education, and upskilling needs of the military. UMGC is recognized as one of the top military- and veteran-friendly schools in the country, with an unmatched expertise and established reputation as a preeminent provider of quality, affordable, career-relevant postsecondary education. Recognition as one of the Best Military Friendly Online Colleges (GuideToOnlineSchools.com) and as the Military Times No. 4 Best

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Cybersecurity Program for 2018, among other accolades, are evidence of UMGC's successful commitment to serving our nation's troops. Most recently, in 2019 UMGC was competitively selected as one of five partner institutions to the emergent U.S. Naval Community College to serve the Navy and Marines.

All of these considerations are reflected in UMGC's proposal herein to offer a new Bachelor of Science in Data Science degree. The proposed B.S. in Data Science is designed to meet the growing need for highly skilled professionals who can keep pace with the growth in demand for data science expertise in the workforce. In today's increasingly competitive marketplace, organizations need individuals with the requisite skills to transform the growing amount of industry, product, and customer behavior data into actionable information to support operational decision making. This new "data world" demands that organizations analyze large datasets to discover hidden knowledge, develop predictive modeling solutions to successfully adapt to new economic and social situations, and present information in such a way that decision makers across the organization can fulfill their responsibilities in an efficient and effective manner.

The proposed Bachelor of Science program in Data Science is designed to meet the growing need for highly skilled professionals who can transform the increasing amounts of data confronting all organizations into usable forms. One of the major outcomes of the program is to provide students with hands-on experience with a variety of the most ubiquitous analytical tools available for the purpose of organizing large data sets. At the same time, students will acquire fundamental knowledge and skills in data science that will equip them to adapt to future changes in tools, technology, and the marketplace. The program endeavors to produce graduates who can respond to workforce demands and emerging needs and who, upon graduation, possess an immediately implementable skill set to succeed in a global environment of workforce diversity, technological innovation, expanding competition, and ever-increasing amounts of data in our highly digitized world.

The proposed B.S. in Data Science program will prepare students for careers in a sector that Glassdoor[1] reports in the top spot of the 50 best jobs in America in terms of salary, job satisfaction, and openings for the third year in a row.

The proposal aligns with UMGC's mission by providing a learner-focused program based on leading-edge adult learning theory and curriculum design that accommodates the needs of students and the community. In addition, this Bachelor of Science in Data Science program aligns with UMGC's mission to offer high quality, workplace-relevant academic programs that expand the range of credentials and career opportunities for working adult, federally employed, and military affiliated students.

The Bachelor of Science in Data Science will support students' professional development with opportunities to learn from employers and peers. Students are given time to practice skills as they progress through formative instruction. The fully online, asynchronous program model offers flexibility, continuing education, and social opportunities to adults interested in refreshing and reshaping their career opportunities. Detailed descriptions of the program and courses within the major are in section G.

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

As the public state and national leader in distance and distributed education, UMGC awards associate, bachelor's, master's, and doctoral degrees, as well as undergraduate and post- baccalaureate certificates. The university's academic inventory offers programs that are core to any public university, but UMGC's mission to serve adult students results in a sustained academic emphasis on career-relevant and workforce-aligned programs. Consequently, the university awards degrees and certificates in the arts and humanities, behavioral and social sciences, business and management, health-related fields, computing, education, and technology. As part of its emphasis on career-relevant education, UMGC offers non-credit

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[1] https://www.glassdoor.com/List/Best-Jobs-in-America-2019-LST_KQ0,25.htm

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professional development programs and hosts professional conferences and meetings supporting economic and societal needs of the State.

The B.S. in Data Science was constructed using UMGC's institutional learning goals that help students master academic and professional content and include a strong emphasis on technology and information literacy. Data Science is an interdisciplinary field, requiring synthesis of knowledge across a variety of related fields of skill and ability. The program builds upon UMGC's general education requirements and a solid understanding of scientific and quantitative reasoning through required coursework in mathematics, statistics, computer science and information technology. Although data science professionals must possess a high level of quantitative and technical expertise, the ability to translate the results of data science methods for non-technical managers is critical to positively impact decision-making processes. Thus, critical thinking and problem-solving, communication, teamwork and the ability to accommodate diverse perspectives are all as important as technical knowledge and skills.

The Data Science program begins with courses in applied statistics, business intelligence, data analytics and visualization, which also comprise the embedded undergraduate certificate in Business Analytics, a certificate that is accessible to majors and non-majors alike. Later courses address more advanced knowledge and skill-development in data science, machine learning, artificial intelligence, big data analytics, and data ethics. Although the program includes a distinct course in data ethics, the institutional learning goal of ethics and civic awareness is not restricted to that course but is a recurring theme running throughout the program. Finally, from the initial courses through to the capstone, institutional learning goals of developing job-seeking skills and the capacity for lifelong learning are essential for the continuously evolving field of Data Science.

Because this program will provide adult students with an opportunity to pursue the emerging and critical field of data science, it is an institutional priority in direct alignment with UMGC's statutory mandate and mission to provide career-relevant programs. In addition, the strong emphasis on technological and informational literacy and expertise, critical thinking, problem-solving, communication, teamwork, the ability to accommodate diverse perspectives, the development of job-seeking skills, and the capacity for life-long learning for both majors and students of other majors via the undergraduate certificate make this proposed program an institutional priority.

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.)**

No new general funds are required for the implementation of this program. The financial table in section L is based only on students entering the new program.

New courses will be developed and funded through existing budget allocation of funds in this fiscal year and through a departmental budget allocation as part of the FY 2022 budget process. The financial data in Table 2 in section L reflects an existing base of FTE faculty, administrative staff, adjunct faculty, and support staff, which will be sufficient to support the launch of this Bachelor of Science in Data Science. Salaries are shown with benefits at current rates of 37%.

4. **Provide a description of the institution's commitment to:**
   a) ongoing administrative, financial, and technical support of the proposed program

UMGC's support services are designed to accommodate students who may not be physically in Maryland or who would simply prefer to access support remotely. These services are, therefore, intentionally and thoughtfully built for complete online delivery rather than in the primarily face-to-face format that exists on traditional campuses. Support services include the following:

- Help@UMGC provides support services for the learning management system (LEO). A specialized technical support team for LEO questions and problems is available 24 hours a day,

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seven days a week, 365 days a year. In addition, UMGC trains faculty to handle some LEO troubleshooting, publishes LEO FAQs, provides chat, phone, and e-mail access to a Help Center with a comprehensive knowledge base and includes a peer-to-peer feature in the online classroom to encourage students to help each other with LEO issues.

- The Digital Teaching and Learning unit within Academic Affairs provides instructional-design support and consultation to Help Desk staff and program leadership to optimize the learning environment across delivery modes and resolve challenges or obstacles students and faculty encounter.
- Students also receive 24/7 support in the use of educational technology from UMGC's Virtual Lab Assistance team, which resolves students' technical questions and issues in lab environments. Complementarily, program leadership and faculty support students in the proficiency of use with educational technology tools.
- MyUMGC is a self-service portal that provides access to administrative functions and student records. UMGC has designed this portal to ensure that students around the world can complete administrative tasks and view records at their convenience.
- UMGC's library is directly accessible through a link within each online classroom. The library helps to educate students in the use of information resources and services and develops and manages UMGC's extensive online library collection.
- The Effective Writing Center (EWC) offers an array of writing-related services to students, including review of draft papers, guest lecturers on writing skills for the classroom, a plagiarism tutorial, resources on citing and referencing, and resources to support research activities. The EWC is also directly accessible through a link within each online classroom.
- Turnitin has been integrated within courses as a developmental tool for students to assist with achieving authenticity in their writing.
- Subject matter tutoring is available in select courses. Subject matter tutors can help define and explain concepts, clarify examples from course content, and guide students toward understanding a particular topic. Students can connect with a subject matter tutor by accessing a link in their online classroom.
- The Office of Accessibility Services arranges accommodations for students with disabilities. Students can register with this office via an online form and then work with a staff member to receive appropriate accommodations for either online or hybrid courses. UMGC students move locations frequently and often need to adjust their course schedules because of work or family obligations so the Office of Accessibility Services is prepared to help students with transitioning their accommodations even when these changes occur.
- The Office of Career Services and its CareerQuest portal provides quality resources and services to assist students and alumni with their career planning and job search needs including Mentoring and Internship Plus programs. This office supports students who are transitioning from one career to another or are looking to climb up the corporate ladder, in addition to those who are entering the workforce for the first time. The CareerQuest portal is available 24 hours a day, seven days a week and includes an online database that allows students to connect with local and national hiring managers.
- The Alumni Association is a way for graduates to network and connect. Its online community features a career center, information on available chapters, discussion boards, photo sharing, and a resource center.
- The Financial Aid Office helps students understand and navigate the process of filing for financial aid. Extended office hours ensure that students can receive support quickly and staff members have expertise with a variety of financial aid options as UMGC students may be using employer assistance, veterans' benefits, or other aid that is more common among adult student populations.
- Success Coaches assist students with mapping out degree plans, selecting and scheduling courses, and generally navigating the administrative and academic landscape of earning a degree or certificate.

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

This is not applicable as this program is new.

B. **Critical and Compelling Regional or Statewide Need as Identified in the State Plan:**
   1. **Demonstrate demand and need for the program in terms of meeting present and future needs of the region and the State in general based on one or more of the following:**
      a) **The need for the advancement and evolution of knowledge**
      b) **Societal needs, including expanding educational opportunities and choices for minority and educationally disadvantaged students at institutions of higher education**
      c) **The need to strengthen and expand the capacity of historically black institutions to provide high quality and unique educational programs**

As an open access institution, UMGC makes educational opportunities and choices available for all students within the state of Maryland, including new college majority populations – especially military affiliated and working adults most often left behind by higher education. In the School of Cybersecurity and Information Technology, where the B.S. Data Science will be located, approximately 66% of undergraduate students are military affiliated, of whom approximately 38% are active duty. The average age of the school's student population is 31, 74% of students are working full-time, and 75% are enrolled part-time. On average, UMGC students transfer 38 credits to the university; 43% of students transfer between 30-59 credits and approximately 36% transfer between 60-89 credits. And UMGC's global reach means nearly 60% of students in the School of Cyber and IT live outside Maryland, including those enrolled overseas.

In addition, the need for the advancement and evolution of knowledge critical to social and economic progress is a central concept in the curriculum of the proposed Data Science degree. Critical thinking, problem-solving, and communication skills are required skills for a data scientist and are central to the program's objectives to prepare students to enter the workforce and advance in their careers. The program also develops ethics, civic awareness, and the capacity for lifelong learning, which are all essential skills for the continuously evolving field of Data Science.

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

The program proposal is designed to meet present and future needs of the state, as identified in 2017-2021 State Plan for Post-Secondary Education: Student Success with Less Debt (State Plan).[2] This program supports the three primary goals in the State Plan in the following ways:

- The program serves Goal 1 (Access) in the State Plan in that it is designed to support UMGC's overall mission to set a global standard for excellence and to be respected as a leader in affordable and accessible adult education programs. In addition, UMGC administers its programs to meet the University System of Maryland goals of effectiveness and efficiency by employing data-driven decision-making that ensures that academic programs are broadly accessible and offer high quality education at an affordable cost.

  At UMGC, this commitment to affordability and access is synonymous with a commitment to diversity and inclusion. The university's open admission approach is central to this commitment. The process to apply for admission is streamlined and does not require the submission of standardized test scores. Admission requirements for the Bachelor of Science in Data Science are aligned with this mission.

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[2] Source: 2017-2021 Maryland State Plan for Postsecondary Education:
http://www.mhec.state.md.us/About/Pages/2017StatePlanforPostsecondaryEducation.aspx

- The program serves Goal 2 (Success) and Goal 3 (Innovation) in the State Plan, as it is based on principles of competency- and performance-based learning that are at the forefront of developments in adult learning in higher education. Competency-based learning is an outcomes-based approach to education that emphasizes what students should know and be able to do to be successful in their disciplines, fields, and careers. The approach is learner-focused, and authentic assessment (the measurement of what students have learned and the competencies students master) is embedded in every step of the learning process to assist students in building real-world, job-relevant competencies in real time. The Bachelor of Science in Data Science program will employ authentic, project-based assessments that are relevant to tasks that graduates will actually perform on the job; such projects serve as both the means of instruction and assessment of learning in the program. Retention and success focus on students' learning experiences and are improved through enhanced learning resources (e.g. readings, handouts, slides, etc.). These resources are provided online within the learning management system. The methodology and on-demand nature of this type of student support is innovative in higher education and online learning, thus reflective of best practices in adult teaching and learning.

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

There is a rapidly increasing demand for data scientists at the bachelor's degree level - individuals who can extract data, formulate models and apply quantitative analysis in a proactive manner. Evidence of strong demand for data scientists is derived from reviews of job sites and industry reports. According to the 2020 LinkedIn Emerging Jobs Report[3], the highest growth jobs related to data science and data analysis include Artificial Intelligence Specialist, which requires expertise in machine learning, deep learning, python, and natural language processing (ranked #1 at 74% annual job growth); Data Scientist (37% annual job growth); and Data Engineer (33% annual job growth). About 11.5 Million data science jobs will be created by 2026 according to U.S. Bureau of Labor Statistics (BLS)[4].

Burning Glass analysis shows that projected market demand for data scientists will grow 19% over the next 10 years (See Figure 1 below). Although researchers tend to define the jobs/occupations for data scientists differently – resulting in occasional differences in projected growth – the broadest consensus is that the job market for this field is strong.

Figure *1*: Burning Glass Projected Growth in Data Scientist Employment Market   Occupation Analysis – Data Scientist

Utilizes skills and experience to systematically answer questions using data to provide actionable recommendations. Commonly utilizes advanced statistical analysis and machine learning techniques. Common responsibilities also include data cleaning and data management.

Common job titles: Data Scientist, Senior Data Scientist, Lead Data Scientist, Principal Data Scientist, Data Scientist II

Active Selections: Nationwide, Data Scientist

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[3] https://business.linkedin.com/content/dam/me/business/en-us/talent-solutions/emerging-jobs-report/Emerging_Jobs_Report_U.S._FINAL.pdf
[4] BLS projects a 31% increase in the Data Science employment market between 2018-28: https://www.bls.gov/news.release/ecopro.nr0.htm

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Source: Labor Insight (Burning Glass Technologies)

Similarly, EMSI modeling[5] of job listings related to data scientists found 66,734 unique positions listed nationwide from Sept. 2017 to Dec. 2020(See Figure 2 below). These positions are being posted with a higher frequency than the average for all other occupations within the region (5:1 for data scientists compared to 4:1 overall), demonstrating that these roles are harder to fill, despite market demand. This indicates the availability of openings in the job market to be served by the new program. These positions are also compensated very highly, with a median advertised salary of $120,700.

Figure 2: EMSI Data on the Data Scientist Employment Market
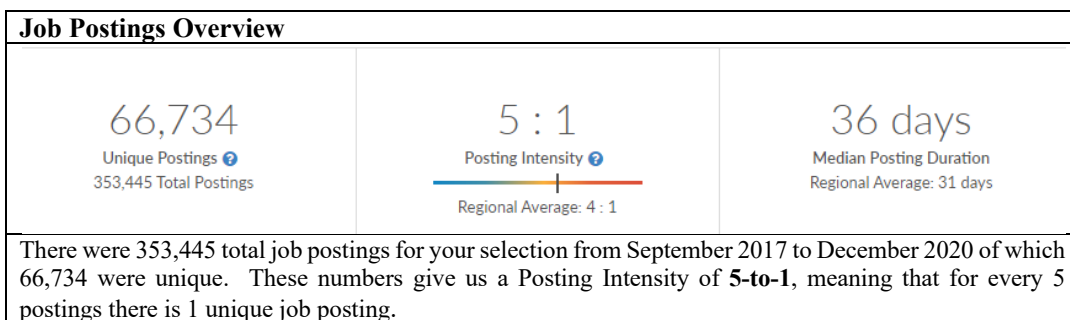
This trend is even stronger in the DMV (DC-VA-MD-WV) region where the posting intensity is 7:1 compared to the 4:2 average for all other occupations within the region, and the median advertised salary is $125,200.[6]

Our research shows high job demand for data scientists and a significant skill gap in the employment marketplace; companies are finding it difficult to fill their open positions with qualified candidates. LinkedIn[7] has noted that the number of individuals graduating with adequate skills to enter data professions trailed the job demand by 150,000.

For the third year in a row, Glassdoor reports[8] "data scientist" in the top spot of the 50 best jobs in America in terms of salary, job satisfaction and openings. According to Forbes/IBM,[9] 61% of data scientist and advanced analysis positions will be available to bachelor's degree holders, while 39% will require a master's degree or a PhD. Burning Glass Technology reported similar findings, noting that around 64% of the positions will be filled by bachelor's degree holders. Figure 3 shows the required years of experience and educational level.

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[5] Emsi Data Sources: https://www.economicmodeling.com/data-sources/
[6] ibid.
[7] https://news.linkedin.com/2018/8/linkedin-workforce-report-august-2018
[8] https://www.glassdoor.com/List/Best-Jobs-in-America-2019-LST_KQ0,25.htm
[9] https://www.forbes.com/sites/louiscolumbus/2017/05/13/ibm-predicts-demand-for-data-scientists-will-soar-28-by-2020/

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Figure 3: Burning Glass: 64% of Data Science openings filled by B.S. degree holders.

Years of Experience

Educational Level
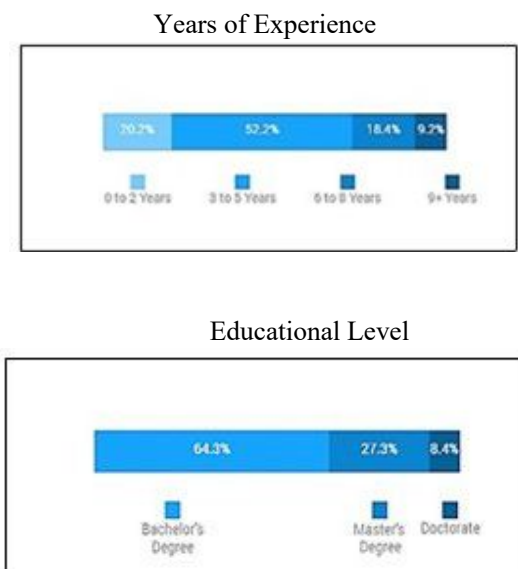
The design of the B.S. in Data Science reflects extensive research to determine the optimal skill set for market-aligned curriculum. The top 15 keywords based on skills and topics for the B.S. in Data Science are summarized in Figure 4. There is nearly universal growth across this skill set (with the exceptions of data mining and statistics, which are increasingly being channeled toward machine learning and data science). Skills that this Data Science program will emphasize show an exceptional surge in projected demand – such as machine learning (↑ 34.7%), deep learning (↑ 84%), Python (↑ 21.6%), Tableau (↑ 28.2%), artificial intelligence (↑ 24.8%) and natural language processing (↑ 22.8%).

Figure 4: Burning Glass Skills Analysis, of Job Postings and Projected Job Growth[10]

Skill	Description	Job Postings Requesting (Last 12 months)	Projected Growth (2 Years)
Data Science	Data science, also known as data-driven science, is an i	36,716	16.0%
Python	Python is a widely used high-level programming langua	28,503	21.6%
Machine Learning	Machine learning is the subfield of computer science th	25,832	34.7%
SQL	SQL (ESS-kew-EL or SEE-kwl, Structured Query Languag	19,421	2.8%
Data Analysis	Data analysis, also known as analysis of data or data ar	10,622	1.3%
Big Data	Big data is a term for data sets that are so large or com	10,148	0.8%
Predictive Models	Predictive modeling uses statistics to predict outcomes.	9,414	12.5%
Artificial Intelligence	Artificial intelligence (AI, also machine intelligence, MI)	8,874	24.8%
Data Mining	Data mining is the computing process of discovering pa	8,573	-6.7%
Natural Language Processing	Natural language processing (NLP) is a field of compute	7,431	22.8%
Tableau	Tableau Software (tab-LOH) is a software company he	7,258	28.2%
Deep Learning	Working experience of Deep Learning. Deep Learning is	7,123	84.0%
SAS	SAS (previously Statistical Analysis System) is a software	6,915	4.3%
Data Visualization	Working experience with the creation and study of the	6,480	18.2%
Statistics	Statistics is a branch of mathematics dealing with the c	5,601	-2.6%
Source: Labor Insight (Burning Glass Technologies); Occupation Analysis - Data Scientist; Nationwide, United States			

Further, in the DMV region, a search using keywords associated with the program (machine learning, artificial intelligence, natural language processing, data visualization, data science, business intelligence, Python) shows a very high demand (88,881 job postings), a projected growth of 40.1% over the next ten years, and a Location Quotient at its highest level (Very High) as per Burning Glass[11] (See Figure 5 below).

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[10] Burning Glass: Data accessed 28 October 2020
[11] Burning Glass: Data accessed 29 October 2020

Figure 5: Burning Glass Data Science Skills Analysis, based on DMV Job Postings

Skill Analysis
Skill Cluster: Analysis: Machine Learning, Information Technology: Artificial Intelligence, Analysis: Natural Language Processing (NLP), Analysis: Data Visualization, Analysis: Data Science, Analysis: Business Intelligence, **Skill:** Python

The market data consistently shows high job growth for Data Scientists and demonstrates that these roles are harder to fill than others. The 2020 LinkedIn Emerging Jobs Report[12] reports that "Data science is booming and starting to replace legacy roles. Unsurprisingly, data science is a field that is seeing continued growth on a tremendous scale, but our data shows data scientists may be augmenting responsibilities traditionally done by statisticians as some industries, like insurance, gear up for the future."

Students seeking employment as data scientists will see a strong nationwide demand for their skills. Figure 6 below shows top industries where data scientists are hired, and figure 7 shows major employers who are hiring data scientists. Hiring of data scientists is generally ongoing in all sectors, but the top employers are in the fields of professional, scientific, and technical services along with Finance and Insurance. Health care, retail and manufacturing are increasingly adding positions for graduates in the field of data science and analytics. The BS in Data Science responds directly to this large unmet demand in these industries.

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[12] LinkedIn:https://business.linkedin.com/content/dam/me/business/en-us/talent-solutions/emerging-jobs-report/Emerging_Jobs_Report_U.S._FINAL.pdf

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Figure 6: Burning Glass Data Science jobs by Industry and Employers
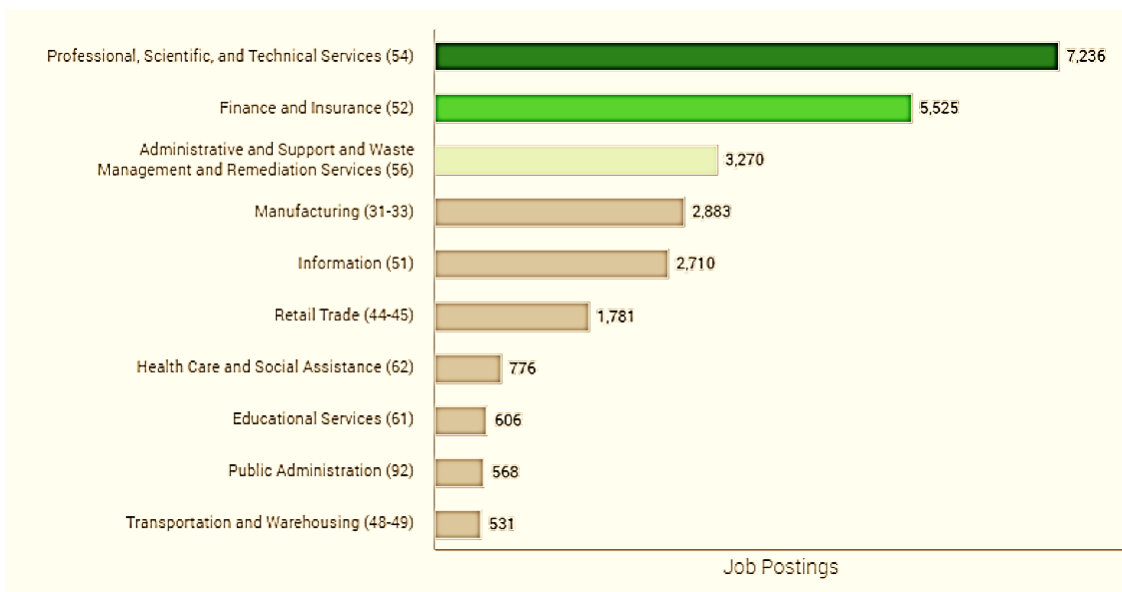
Figure 7: Burning Glass Data Science jobs by Employer
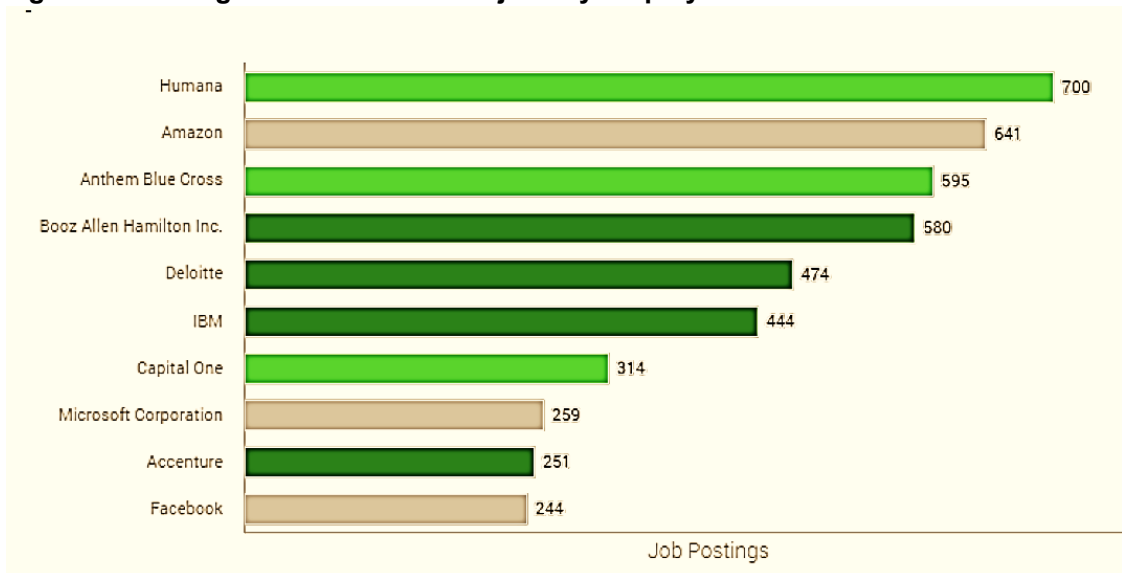
4. **Provide data showing the current and projected supply of prospective graduates.**

As the B.S. in Data Science is a newly introduced, multi-disciplinary classification of instructional program (CIP) under the 2020 revision of taxonomies, there are no pre-existing institutional degree-completion data to project prospective student demand. Moreover, traditionally, data science degrees have been awarded at the master's level; data science programs at the undergraduate level are relatively new for most schools across the country.

However, UMGC introduced the closely related Master of Science in Data Analytics in 2013, which has proved to be a popular offering for students, with 836 enrollments in 2019 and 829 enrollments in 2020. For a relatively new program, these enrollment numbers show durable prospective student demand,

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despite the advanced degree level, significant technical background and experience requirements, and a premium-program tuition rate. These are obstacles that the B.S. in Data Science program will not have.

Based on the totality of the market and job-demand data and the enrollment trends in technical fields at UMGC, our 5-year projected enrollment and graduate trend for the B.S. in Data Science are summarized in Table 1 below.

Table 1 Enrollment Projections

	Year 1	Year 2	Year 3	Year 4	Year 5
Projected Enrollment	50	75	100	125	125

It is anticipated that approximately 50 degrees will be awarded each year after the degree is established and reaches steady state.

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.**
   2. **Provide justification for the proposed program.**

Ten years ago, the McKinsey Global Institute (MGI) and McKinsey's Business Technology Office[13] published ground-breaking research on the impact of big data on industries and employment. At the time, MGI estimated that by 2018 the United States would face a shortage of 140,000 to 190,000 people with "deep analytical skills," and highly specialized expertise in data science. The MGI report further identified that an additional 1.5 million professionals from across various content specialties would require "the know-how to use the analysis," the ability to use the results of data science in decision-making.

In the last decade, many universities have introduced courses and areas of concentration in data analytics to prepare managers and professionals in healthcare, business, marketing, finance and other fields for the use of the results of data science for decision-making. Fewer universities have tackled the task of preparing people with "deep analytical skills," by creating programs in Data Science and Data Analytics.

As the survey below illustrates, the existing programs tend to view the topic through specific lenses - e.g., a business management-based viewpoint or a mathematical-based viewpoint. In attempting to capture the diverse applications of data science, the approach has been to offer a variety of specializations within a major such as health care or economics. Perhaps as a consequence, the growing role of artificial intelligence and machine learning, as well as the important aspects of ethics and cybersecurity, have not been addressed in the core area of these programs. UMGC's proposed B.S. in Data Science program aims to address the "deep analytical skills" and data science expertise shortage, creating value and insights for decision-makers.

A review on December 7, 2020 of current bachelor's degree programs in data science on the Maryland Higher Education Commission website shows bachelor's degree programs in Data Science at four institutions in Maryland: Capitol Technology University, Salisbury University, Mount St. Mary's University, and Loyola University of Maryland. A fifth program in Integrative Data Analytics, offered by Goucher College, has a heavily math-based core, with either data science or economics as elective specializations. Tables 2 – 6 below compare and contrast UMGC's program with these programs.

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[13] Big data: The next frontier for innovation, competition, and productivity: https://www.mckinsey.com/business-functions/mckinsey-digital/our-insights/big-data-the-next-frontier-for-innovation

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Table 2: Comparison of UMGC Bachelor of Science in Data Science to Capitol Technology University (CTU)'s Bachelor of Science in Data Science		
	UMGC Bachelor of Science in Data Science	**Capitol Technology University (CTU)'s Bachelor of Science in Data Science**
Degree Requirements and Structure (number of credits, a single required sequence vs. electives)	33 credits in the data science major, including 3 credits in cybersecurity; 7 credits in related requirements in math and statistics; 6 credits in related requirements in programming and information systems. All courses are required. No electives within the major.	42 credits in analytics (which includes 6 credits in programming); 33 credits in business management; 20 credits in math and science; Most courses are required; one elective in science
Delivery (onsite vs. online)	Online and asynchronous; no on-site requirements	Program requires on-site courses. Last two years are offered online.
Enrollment (full-time vs. part-time)	Over the past five years, approximately 75% of UMGC students registering for classes within the School of Cybersecurity and Information Technology did so on a part-time basis (6 credits per term). We expect this trend to continue.	Full-time and part-time students
Admissions Requirements/ Target Audience	UMGC is an open-admission institution.	High School Requirements: • at least a 2.2 grade point avg • SAT score of at least 800 or an ACT score of 17 (now optional to submit scores); • three years of math, including plane geometry and algebra II; • two years of science; and • two years of social science.
Primary Points of Differentiation in Requirements and Target Audience: The UMGC program is completely online and asynchronous. This provides extreme flexibility for working professionals and military affiliated learners around the world. UMGC is an open-admission institution.		
CIP Code	307001 Title: Data Science Definition: A program that focuses on the analysis of large-scale data sources from the interdisciplinary perspectives of applied statistics, computer science, data storage, data representation, data modeling, mathematics, and statistics. Includes instruction in computer algorithms, computer	307001 Title: Data Science Definition: A program that focuses on the analysis of large-scale data sources from the interdisciplinary perspectives of applied statistics, computer science, data storage, data representation, data modeling, mathematics, and statistics. Includes instruction in computer

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	programming, data management, data mining, information policy, information retrieval, mathematical modeling, quantitative analysis, statistics, trend spotting, and visual analytics.	algorithms, computer programming, data management, data mining, information policy, information retrieval, mathematical modeling, quantitative analysis, statistics, trend spotting, and visual analytics.
Primary Points of Differentiation in CIP: No difference in CIP codes.		
Pedagogy and Learning Model	The curriculum is based on principles of competency- and performance-based learning. Authentic assessments are embedded throughout; students "learn by doing" through scenario-based projects grounded in real-world situations and problems and using interactive tools and case studies that incorporate applied learning.	CTU uses limited project-based learning in select classes; the overall approach is not competency-based.
Program Content	The UMGC program is broadly based, with courses in Data Science supplemented by courses in Mathematics, Business, Computer Science, Machine Learning and Ethics. The capstone is integrative, project-based and employer-centric. This major can be combined with many minors including business management, cybersecurity, health services management, gerontology, homeland security, political science, etc.	The 42 credits of Capital Technology University's program in "Analytics" parallel's UMGC's curriculum; however, in contrast to UMGC, CTU's program is heavily rooted in business management, with 33 required credits in the major being devoted to business classes (in the "Business Management" area).
Primary Points of Differentiation in Pedagogy/Learning Model and Content: UMGC's program is focused on the theory and underlying technology of Data Analytics, and its application to *any* area where collection of data is involved. It uses a learning model based on the principles of competency- and project-based learning. The CTU program has a substantial emphasis on business-oriented courses. The overall approach is not competency-based; only select classes use project-based learning. UMGC's program is structured as a straight-line pathway, whereas CTU's programs allows for electives.		

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Table 3: Comparison of UMGC Bachelor of Science in Data Science to Salisbury University's Bachelor of Science in Data Science		
	UMGC Bachelor of Science in Data Science	**Salisbury University's Bachelor of Science in Data Science**
Degree Requirements and Structure (number of credits, a single required sequence vs. electives)	33 credits in the data science major, including 3 credits in cybersecurity; 7 credits in related requirements in math and statistics; 6 credits in related requirements in programming and information systems. All courses are required. No electives within the major.	10-credit core in analytics; 16 credits in math; 8 credits in programming. All core courses are required; specialization within one of the following areas (14-20 credits, some elective choice): • Astrostatistics • Bioinformatics • Chemometrics • Computational Data Science • Geoanalytics • Mathematical Data Science
Delivery (onsite vs. online)	Online and asynchronous; no on-site requirements	On-site only
Enrollment (full-time vs. part-time)	Over the past five years, approximately 75% of UMGC students registering for classes within the School of Cybersecurity and Information Technology did so on a part-time basis (6 credits per term). We expect this trend to continue.	Full-time and part-time students
Admissions Requirements/ Target Audience	UMGC is an open-admission institution.	High School Requirements: • Standardized SAT or ACT test scores are required for applicants with below a 3.50 weighted cumulative grade point average. • Students wishing to enter college are encouraged to complete the college preparatory curriculum in high school.
Primary Points of Differentiation in Requirements and Target Audience: The UMGC program is completely online and asynchronous. This provides extreme flexibility for working professionals and military affiliated learners around the world. UMGC is an open-admission institution.		
CIP Code	307001 Title: Data Science Definition: A program that focuses on the analysis of large-scale data sources from the interdisciplinary perspectives of applied statistics, computer	307001 Title: Data Science Definition: A program that focuses on the analysis of large-scale data sources from the interdisciplinary perspectives of applied statistics, computer

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	science, data storage, data representation, data modeling, mathematics, and statistics. Includes instruction in computer algorithms, computer programming, data management, data mining, information policy, information retrieval, mathematical modeling, quantitative analysis, statistics, trend spotting, and visual analytics.	science, data storage, data representation, data modeling, mathematics, and statistics. Includes instruction in computer algorithms, computer programming, data management, data mining, information policy, information retrieval, mathematical modeling, quantitative analysis, statistics, trend spotting, and visual analytics.
Primary Points of Differentiation in CIP: There is no difference in the CIP code. All new programs in the field are filled under the CIP 307001 established in 2020.		
Pedagogy and Learning Model	The curriculum is based on principles of competency- and performance-based learning and authentic assessments are embedded throughout; students "learn by doing" through scenario-based projects grounded in real-world situations and problems and using interactive tools and case studies that incorporate applied learning.	
Program Content	The UMGC program is broadly based, with courses in Data Science supplemented by courses in Mathematics, Business, Computer Science, Machine Learning and Ethics. The capstone is integrative, project-based and company-centric. This major can be combined with many minors including business management, cybersecurity, health services management, gerontology, homeland security, political science, etc.	Salisbury University's program in heavily rooted in mathematics, with a small core in analytics. The application areas are highly specialized and also oriented towards mathematics and statistics.
Primary Points of Differentiation in Pedagogy/Learning Model and Content: UMGC's program is focused on the theory and underlying technology of Data Analytics, and its application to *any* area where collection of data is involved. In terms of program content, the SU program is heavily rooted in Mathematics. UMGC's program is structured as a straight-line pathway, whereas Salisbury's program includes electives.		

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Table 4: Comparison of UMGC Bachelor of Science in Data Science to Mount Saint Mary's University's Bachelor of Science in Data Science		
	UMGC Bachelor of Science in Data Science	**Mount Saint Mary's University's Bachelor of Science in Data Science**
Degree Requirements and Structure (number of credits, a single required sequence vs. electives)	33 credits in the data science major, including 3 credits in cybersecurity; 7 credits in related requirements in math and statistics; 6 credits in related requirements in programming and information systems. All courses are required. No electives within the major.	18 core credits in data science; 9 credits in computer science/programming; 7 credits in math; one data skills elective 15 credits in an application area (5 elective course choices): • Computational Science • Data Engineering • Operations Research • Analytics for Business
Delivery (onsite vs. online)	Online and asynchronous; no on-site requirements	On-site only
Enrollment (full-time vs. part-time)	Over the past five years, approximately 75% of UMGC students registering for classes within the School of Cybersecurity and Information Technology did so on a part-time basis (6 credits per term). We expect this trend to continue.	Full-time and part-time students
Admissions Requirements/ Target Audience	UMGC is an open-admission institution.	Application Requirements: • High School Recommendation: 4 years of English, 3 years of mathematics, 3 years of science, 2 years of one foreign language, and 3 years of social studies/history. • Adult undergraduate applicants must have completed 12 credits with a 2.0 average and have three years of work experience.
Primary Points of Differentiation in Requirements and Target Audience: The UMGC program is completely online and asynchronous. This provides extreme flexibility for working professionals and military affiliated learners around the world. UMGC is an open-admission institution.		
CIP Code	307001 Title: Data Science Definition: A program that focuses on the analysis of large-scale data sources from the interdisciplinary perspectives of applied statistics, computer science, data storage, data representation, data modeling, mathematics, and statistics.	307001 Title: Data Science Definition: A program that focuses on the analysis of large-scale data sources from the interdisciplinary perspectives of applied statistics, computer science, data storage, data representation, data modeling, mathematics, and statistics.

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	Includes instruction in computer algorithms, computer programming, data management, data mining, information policy, information retrieval, mathematical modeling, quantitative analysis, statistics, trend spotting, and visual analytics.	Includes instruction in computer algorithms, computer programming, data management, data mining, information policy, information retrieval, mathematical modeling, quantitative analysis, statistics, trend spotting, and visual analytics.
Primary Points of Differentiation in CIP: There is no difference in the CIP code. All new programs in the field are filled under the CIP 307001 established in 2020.		
Pedagogy and Learning Model	The curriculum is based on principles of competency- and performance-based learning and authentic assessments are embedded throughout; students "learn by doing" through scenario-based projects grounded in real-world situations and problems and using interactive tools and case studies that incorporate applied learning.	
Program Content	The UMGC program is broadly based, with courses in Data Science supplemented by courses in Mathematics, Business, Computer Science, Machine Learning and Ethics. The capstone is integrative, project-based and company-centric. This major can be combined with many minors including business management, cybersecurity, health services management, gerontology, homeland security, political science, etc.	As a liberal arts institution, Mount Saint Mary's University has a large core curriculum requirement (46-49 hours). A Minor in Data Science exists.
Primary Points of Differentiation in Pedagogy/Learning Model and Content: UMGC's program is focused on the theory and underlying technology of Data Analytics, and its application to *any* area where collection of data is involved. Its core consists of 33 credits. Mt. St. Mary's program has a much larger core. UMGC's program is structured as a straight-line pathway, Mt. St. Mary's program includes electives.		

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Table 5: Comparison of UMGC Bachelor of Science in Data Science to Loyola University of Maryland's Bachelor of Science in Data Science		
	UMGC Bachelor of Science in Data Science	**Loyola University of Maryland's Bachelor of Science in Data Science**
Degree Requirements and Structure (number of credits, a single required sequence vs. electives)	33 credits in the data science major, including 3 credits in cybersecurity; 7 credits in related requirements in math and statistics; 6 credits in related requirements in programming and information systems. All courses are required. No electives within the major.	An interdisciplinary program of 15 courses (about 45 credits) from information systems, data science, math, statistics and programming. 3 course electives chosen from the above disciplines plus economics. Loyola offers an ethical data science course.
Delivery (onsite vs. online)	Online and asynchronous; no on-site requirements	On-site only
Enrollment (full-time vs. part-time)	Over the past five years, approximately 75% of UMGC students registering for classes within the School of Cybersecurity and Information Technology did so on a part-time basis (6 credits per term). We expect this trend to continue.	Full-time and part-time students
Admissions Requirements/ Target Audience	UMGC is an open-admission institution.	Admissions Target Audience: • Loyola weighs high school grades heavily in admissions decisions. • Students are encouraged to take rigorous coursework, such as honors or AP courses • Students accepted into the class of 2024 had an average GPA of 3.66.
Primary Points of Differentiation in Requirements and Target Audience: The UMGC program is completely online and asynchronous. This provides extreme flexibility for working professionals and military affiliated learners around the world. UMGC is an open-admission institution.		
CIP Code	307001 Title: Data Science Definition: A program that focuses on the analysis of large-scale data sources from the interdisciplinary perspectives of applied statistics, computer science, data storage, data representation, data modeling, mathematics, and statistics. Includes instruction in computer algorithms, computer programming, data management, data mining, information policy, information	110401 Title: Information Science/Studies Definition: A program that focuses on the theory, organization, and process of information collection, transmission, and utilization in traditional and electronic forms. Includes instruction in information classification and organization; information storage and processing; transmission, transfer, and signaling; communications and

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	retrieval, mathematical modeling, quantitative analysis, statistics, trend spotting, and visual analytics.	networking; systems planning and design; human interfacing and use analysis; database development; information policy analysis; and related aspects of hardware, software, economics, social factors, and capacity.
Primary Points of Differentiation in CIP: UMGC application is under the CIP code 307001 that was defined in 2020 to reflect the evolving field of Data Science. Previously established related programs like Loyola University's used CIP codes that more closely reflect the main focus of their program, in this case, Information Systems.		
Pedagogy and Learning Model	The curriculum is based on principles of competency- and performance-based learning. Authentic assessments are embedded throughout; students "learn by doing" through scenario-based projects grounded in real-world situations and problems and using interactive tools and case studies that incorporate applied learning.	
Program Content	The UMGC program is broadly based, with courses in Data Science supplemented by courses in Mathematics, Business, Computer Science, Machine Learning and Ethics. The capstone is integrative, project-based and company-centric. This major can be combined with many minors including business management, cybersecurity, health services management, gerontology, homeland security, political science, etc.	The Loyola data science program concentrates on the analytical and computational skills required within the data science field.
Primary Points of Differentiation in Pedagogy/Learning Model and Content: UMGC's program is focused on the theory and underlying technology of Data Analytics, and its application to *any* area where collection of data is involved. The Loyola program is focused on analytical and computational skills. UMGC's program is structured as a straight-line pathway, Loyola's program includes electives.		

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Table 6: Comparison of UMGC Bachelor of Science in Data Science to Goucher College's Bachelor of Science in Integrative Data Analytics

	UMGC Bachelor of Science in Data Science	Goucher College's Bachelor of Science in Integrative Data Analytics
Degree Requirements and Structure (number of credits, a single required sequence vs. electives)	33 credits in the data science major, including 3 credits in cybersecurity; 7 credits in related requirements in math and statistics; 6 credits in related requirements in programming and information systems. All courses are required. No electives within the major.	4 credits in computer science and 20 credits in math and statistics are required. Some elective choice is available. Machine learning is an option. Two specializations are available: data science (16 credits) or economics (16 credits).
Delivery (onsite vs. online)	Online and asynchronous; no on-site requirements	On-site only
Enrollment (full-time vs. part-time)	Over the past five years, approximately 75% of UMGC students registering for classes within the School of Cybersecurity and Information Technology did so on a part-time basis (6 credits per term). We expect this trend to continue.	Full-time and part-time students
Admissions Requirements/ Target Audience	UMGC is an open-admission institution.	Admissions Target Audience: • 46% of Class of 2023 students were in the top 25% of their high school graduating class • 16 units of college prep coursework is recommended • Goucher has a separate admissions process, Goucher II, for adult undergraduates
Primary Points of Differentiation in Requirements and Target Audience: The UMGC program is completely online and asynchronous. This provides extreme flexibility for working professionals and military affiliated learners around the world. UMGC is an open-admission institution.		
CIP Code	307001 Title: Data Science Definition: A program that focuses on the analysis of large-scale data sources from the interdisciplinary perspectives of applied statistics, computer science, data storage, data representation, data modeling, mathematics, and statistics. Includes instruction in computer algorithms, computer programming, data management, data mining,	300801 Title: Mathematics and Computer Science Definition: A program with a general synthesis of mathematics and computer science or a specialization which draws from mathematics and computer science.

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	information policy, information retrieval, mathematical modeling, quantitative analysis, statistics, trend spotting, and visual analytics.	
Primary Points of Differentiation in CIP: UMGC application is under the CIP code 307001 that was defined in 2020 to reflect the evolving field of Data Science. Goucher College used CIP 300801code that more closely reflects the main focus of the program, in this case, Integration of Mathematics and Computer Science.		
Pedagogy and Learning Model	The curriculum is based on principles of competency- and performance-based learning. Authentic assessments are embedded throughout; students "learn by doing" through scenario-based projects grounded in real-world situations and problems and using interactive tools and case studies that incorporate applied learning.	
Program Content	The UMGC program is broadly based, with courses in Data Science supplemented by courses in Mathematics, Business, Computer Science, Machine Learning and Ethics. The capstone is integrative, project-based and company-centric. This major can be combined with many minors including business management, cybersecurity, health services management, gerontology, homeland security, political science, etc.	The Integrative Data Analytics major has three parts: Entry, Exploration and Specialization. The Entry and Exploration phases are heavily rooted in mathematics and statistics. A capstone is offered in the Data Science specialization. Machine learning is available as an option in the Exploration phase. Neither machine learning nor artificial intelligence are required for students taking the Economics specialization.
Primary Points of Differentiation in Pedagogy/Learning Model and Content: UMGC's program is focused on the theory and underlying technology of Data Analytics, and its application to *any* area where collection of data is involved. In terms of program content, UMGC's program offers a straight-line pathway, while Goucher's program has specializations. Several courses in machine learning and artificial intelligence are required in the UMGC data science program, whereas these topics appear as electives (only in the Core and Data Science Specialization areas), in Goucher's program.		

UMGC is aware of a recent proposal submitted to MHEC by The University of Maryland College Park (UMCP) to create a B.S. program in Data Science. It appears that this program seeks to serve a distinctly different population – students who would normally pursue UMCP programs such as Computer Science, Mathematics, or Statistics but who happen to be interested in the emerging field of Data Science. Such students would have to meet UMCP's entrance requirements. UMCP's program will draw upon courses in computer science, mathematics, statistics, and a required set of new data courses. The program seeks to combine scientific methods, processes, and algorithms, to extract knowledge from data. At this time, it appears that the program will be offered in-person.

UMGC's program, in contrast, is open-entry, offered online, and serves the needs of working-adult learners and world-wide students who are active-duty military, or veterans, and their families. The focus

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of the program is also different. UMGC's program seeks to train students who can transform the increasing amounts of data into usable forms; familiarize students with a variety of analytical tools available for the purpose of organizing large data sets; and help students acquire fundamental knowledge and skills in data science that will equip them to adapt to future changes in tools, technology, and the marketplace. Courses which address only the required fundamental knowledge of programming, mathematics and statistics are included within the program, apart from the other DATA courses.

UMGC carefully reviews letters of Intent from other University System of Maryland institutions that are distributed to USM schools prior to full proposals being submitted to MHEC so that any potential concerns about program duplication (or other matters) can be discussed and resolved collegially by the concerned institutions. It is our goal that new programs being proposed are not in competition with, or unnecessarily duplicative of existing programs. This is in keeping with guidelines outlined in the recently circulated letter (10/1/2020) from MHEC to University Presidents.

These guidelines (in Section 3 on Unreasonable program duplication) state that "Ordinarily, proposed programs in undergraduate core programs consisting of basic liberal arts and sciences disciplines are not considered unnecessarily duplicative". As noted earlier (see Section A), the emerging area of data science plays much the same role as any other discipline in science, in that the knowledge and skills addressed within data science have wide applicability in every other field of knowledge or activity where large amounts of data are collected and analyzed. It is worth noting here that in today's age of the Internet of Things (IoT), generation of large amounts of data is the norm. The data provided in Section C makes it clear that there is a tremendous current need, and fast-growing future need, both in the DMV area and nationwide, of professionals who hold a bachelor's degree with skills that are addressed within the data science discipline. This large, critical need needs to be met with the combined efforts of multiple institutions working in unison, each institution targeting different aspects of the program and/or market needs, and each having the capacity to scale its programs to meet these needs.

In summary, UMGC's online B.S. in Data Science has justifiable and useful points of differentiation from the other programs enumerated in this section. The proposal documents how 1) the proposed program responds directly to a well-sourced market demand that no single institution in Maryland or elsewhere can reasonably supply and, 2) the evidence presented throughout our proposal documents the specific student-type and delivery modality unique to UMGC.

E. **Relevance to High-demand Programs at Historically Black Institutions (HBIs)**
   1. **Discuss the program's potential impact on the implementation or maintenance of high-demand programs at HBIs.**

   A search performed on December 7, 2020, of MHEC's inventory of approved academic programs in Maryland found no bachelor's degree programs in data science at HBIs in Maryland. This includes the four Historically Black Institutions in Maryland (Bowie State University, Coppin State University, University of Maryland Eastern Shore, and Morgan State University). UMGC's proposed program will, therefore, have no impact on high demand programs at HBIs.

F. **Relevance to the identity of Historically Black Institutions (HBIs)**
   1. **Discuss the program's potential impact on the uniqueness and institutional identities and missions of HBIs.**

   A search performed on December 7, 2020, of MHEC's inventory of approved academic programs in Maryland found no bachelor's degree programs in data science at HBIs in Maryland. This includes the four Historically Black Institutions in Maryland (Bowie State University, Coppin State University, University of Maryland Eastern Shore, or Morgan State University). UMGC's proposed program will, therefore, have no impact on the uniqueness and institutional identities and missions of the HBIs.

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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.**

   Like many universities, UMGC began its first steps in data science at the master's level, with a Master of Science in Data Analytics in 2013. Data Science was initially viewed as primarily a graduate level discipline, given the complexity of the content and the techniques and tools utilized in the field. Since those early years, data analytics and data science concepts, tools and techniques have been widely adopted in all areas of the economy, all levels of government, and in the non-profit sector. This has created a rapidly emerging market of entry-level jobs accessible with a bachelor's degree. According to the market research presented in section C, 61% of data scientist and advanced analysis positions will be available to bachelor's degree holders, while 39% will require a master's degree or a PhD.

   The B.S. in Data Science aims to prepare bachelor's-level professionals to enter this dynamic job market, leveraging the teaching and professional expertise of UMGC's existing master's program. The bachelor's program will align with the needs of employers via competency- and project-based teaching and learning approaches and will provide employment-ready data science skills to its graduates. The program is designed to provide critical foundational knowledge of the analysis of large-scale data sources from the interdisciplinary perspectives of applied statistics, computer science, data storage, and data representation and modeling, with the purpose of obtaining insights from data and making strategic data-driven recommendations that influence organizations' outcomes. The program's curriculum incorporates teaching, learning, and assessment strategies that focus on students' development of concrete, job-related knowledge and skills, while reinforcing their understanding of underlying concepts, principles and theories. The program combines study in several technical disciplines to prepare highly qualified data scientists with strong career potential and aligns with the Association for Computing Machinery (ACM) Undergraduate Data Science Curriculum Recommendations.[14]

   The proposed program will be taught entirely online in asynchronous mode and will allow UMGC to further support its mission to teach adult learners in Maryland, across the country, and around the world. This request aligns with UMGC's mission to offer high quality, workplace-relevant academic programs that expand the range of career opportunities to adult students. Specifically, the addition of the B.S. in Data Science diversifies credential options for our working adult and military-affiliated populations, responding to adult learners' need for a variety of pathways to credentials in higher education.

   The proposed program will be hosted in the School of Cybersecurity and Information Technology's Department of Information Technology and will be managed concurrently with the Master of Science in Data Analytics by the Program Director, Dr. Elena Gortcheva.

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

   The Major consists of 11 courses (33 credits, see Section G.4.) plus related mathematics and computer programming courses. Some courses will be sequenced, requiring students to take them in a prescribed order.

   Program Learning Goals are as follows:
   1. Communicate effectively in writing and orally, meeting expectations for content, purpose, organization, audience, and format.
   2. Implement all stages of data science methodology including data extraction, data cleaning, data load, and transformation.
   3. Execute best practices, using diverse technologies, within data science, business intelligence, machine learning and artificial intelligence.

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[14] http://dstf.acm.org/DSReportDraft2Full.pdf

4. Analyze social, global and/or ethical issues and implications related to the use of existing and emerging data science, machine learning and/or artificial intelligence technologies.
5. Evaluate a business problem or opportunity to determine the extent data science can provide a viable solution and translate the business problem into a viable project to meet organizational strategic and operational needs.
6. Incorporate data security, data privacy and risk management best practices in the planning, development, and implementation of data science solutions.
7. Build and deploy the machine learning process throughout its life cycle in full compliance with best practices for tool evaluation, model selection, and model validation.
8. Leverage big data analytics and AI technology to create solutions for stream analytics, text processing, natural language understanding, AI and cognitive applications.
9. Collaborate with team members to plan, evaluate, implement, and document data science solutions.

The first five courses in the program provide a foundation in the principles, concepts, and applications underlying data science and comprise an embedded and stackable certificate in Business Analytics. The Business Analytics certificate would be a readily accessible and highly marketable option for students from all three UMGC Schools.

The heart of the B.S. program is the set of six courses that follow. These are focused on building data science skills that include data manipulation, visualization, machine learning, AI, predictive modeling, and use of the appropriate technology to extract insights from data and provide recommendations to meet organizational strategic and operational needs. The program offers a project-based curriculum that integrates both required technical competencies and essential managerial skills. These skills are threaded throughout the curriculum and were identified through interactions with industry leaders and analysis of market trends and job skills. Technical skills are two-tiered – in the first tier, a strong foundation in statistical and machine learning algorithms and in the second tier, experience in technology and software tools needed to tackle real-world problems. This second tier is dynamic and changes with industry needs. Students gain experience in a variety of software packages and other tools that enable them to perform data preparation, mining, and visualization. The focus of the program is to successfully employ a variety of software and statistical tools to analyze data sets and solve business problems and, at the same time, analyze social, global, and/or ethical issues and implications related to the use of existing and emerging data science, machine learning, and/or artificial intelligence technologies.

The capstone course focuses on the comprehensive application of skills and knowledge acquired in the program to solve a real-world analytical problem. Software tools are used in one or more case studies mirroring the challenges that organizations are facing today. At the conclusion of the program, students will earn a B.S. in Data Science and a certificate in Business Analytics and be prepared for selected industry certifications.

Appendix C shows the mapping of the program learning goals to the core courses in the major.

3. **Explain how the institution will:**
   a) **provide for assessment of student achievement of learning outcomes in the program**
   b) **document student achievement of learning outcomes in the program**

UMGC approaches learning design from an "Understanding by Design" perspective, utilizing a backward design model. This approach begins with identifying the program learning goals that a student will achieve through the program of study. The program learning goals are mapped first to the Degree Qualification Program (DQP) to ensure that the set of learning goals are comprehensive and appropriate for the degree level. In addition, the program learning goals are mapped against UMGC institutional learning goals to validate that the program aligns with the university mission and institutional goals.

Once the program learning goals have been validated through mapping to the DQP and institutional learning goals, the program learning goals are mapped to the courses in the program. This step ensures that all program learning goals are addressed in the curriculum and provide guidance in the development

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of the courses to ensure that each course contributes to the program learning goals without unnecessary duplication of outcomes across courses.

Using the mapping of institutional learning goals to courses, key assignments are identified in courses for use in assessing student achievement of program learning goals. Periodically, a random sample of student artifacts for these identified key assignments are collected and reviewed by faculty to assess how effectively students are meeting the program learning goals.

Using student learning assessment results along with non-direct measures of student learning including student retention and market and labor data, program directors produce an annual review of program quality. For new programs, these annual reviews are integrated into an Academic Program Review including external review after 5 years. After this initial review, programs continue the annual review every year with an Academic Program Review every 7 years.

In November 2020, UMGC licensed AEFIS as its assessment management system. AEFIS will be the central repository for program learning goals, assessment maps, and student artifacts. AEFIS integrates with the D2L LMS to allow student work to be duplicated from the LMS into AEFIS for assessment purposes. This process ensures that assessment review is independent of grades and evaluation within the class and allows for independent review of student work apart from the classroom faculty. AEFIS also holds annual program review reports.

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

   a) Related Requirements

CMIS 102 Introduction to Problem Solving and Algorithm Design (3 credits)
A study of techniques for finding solutions to problems through structured programming and step-wise refinement. The objective is to design programs using pseudocode and implement them in an appropriate programming language. Hands-on practice in debugging, testing, and documenting is provided. Topics include principles of programming, the logic of constructing a computer program, and the practical aspects of integrating program modules into a cohesive application. Algorithms are used to demonstrate programming as an approach to problem solving.

IFSM 201 Concepts and Applications of Information Technology (3 credits)
An introduction to data and the range of technologies (including hardware, software, databases, and networking and information systems) that provide the foundation for the data-centric focus of modern organizations. The objective is to apply knowledge of basic technical, ethical, and security considerations to select and use information technology (and the data that arises from technology) effectively in one's personal and professional lives. Discussion covers issues related to technology as a vehicle for collecting, storing, and sharing data and information, including privacy, ethics, security, and social impact. Applied exercises focus on the manipulation, analysis, and visualization of data and effective data communication strategies.

MATH 140 Calculus I (4 credits)
Prerequisite: MATH 108 or MATH 115. An introduction to calculus. The goal is to demonstrate fluency in the language of calculus; discuss mathematical ideas appropriately; and solve problems by identifying, representing, and modeling functional relationships. Topics include functions, the sketching of graphs of functions, limits, continuity, derivatives and applications of the derivative, definite and indefinite integrals, and calculation of area.

STAT 200 Introduction to Statistics (3 credits)
An introduction to statistics. The objective is to assess the validity of statistical conclusions; organize, summarize, interpret, and present data using graphical and tabular representations; and apply principles of inferential statistics. Focus is on selecting and applying appropriate statistical tests and determining reasonable inferences and predictions from a set of data. Topics include methods of sampling; percentiles;

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concepts of probability; probability distributions; normal, t-, and chi-square distributions; confidence intervals; hypothesis testing of one and two means; proportions; binomial experiments; sample size calculations; correlation; regression; and analysis of variance (ANOVA).

b)   Program Requirements

DATA 220: Introduction to Data Analytics (3 credits)
Prerequisite: STAT 200. Practical introduction to the methodology, practices, and requirements behind data science to ensure data is relevant and properly manipulated to solve problems and address a variety of real-world projects and business scenarios. Focus is on the foundational statistical concepts applied to describing datasets with summary statistics, simple data visualizations, statistical inference and predictive analytics. Through probability, hypothesis testing, and linear model building, students will use data to draw conclusions about the underlying patterns that drive everyday problems.
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DATA 300: Foundations of Data Science (3 credits)
Prerequisites: CMIS 102, IFSM 201, DATA 220. An examination of the role of data science within a business and society. The goal is to identify a problem, collect and analyze data, select the most appropriate analytical methodology based on the context of the business problem, build a model, and understand the feedback after model deployment. Practical emphasis is on the process of acquisition, cleaning, exploring, analyzing, and communicating data obtained from variety of sources. Assignments will require working with data in programming languages such as Python, wrangling data programmatically and preparing data for analysis, using libraries like NumPy and Pandas.

CSIA 300: Cybersecurity for Leaders and Managers (3 credits)
(Designed in part to help prepare for the EC-Council Secure Computer User [CSCU] certification.) Prerequisite: Any CMIS, CMSC, CMIT, CMST, CSIA, IFSM, or SDEV. Recommended: IFSM 201. A survey of the cybersecurity principles, practices, and strategies required by leaders and managers to become strategic partners in the establishment, management, and governance of an enterprise's cybersecurity program. The aim is to develop both an understanding of how cybersecurity supports key business goals and objectives and the essential skills necessary for success in a leadership or managerial role. Topics include the fundamentals of cybersecurity practices and principles; enterprise IT governance processes and security controls; data security; the information life cycle; intellectual property protections; privacy laws and regulations; security education, training, and awareness; and the need for cooperation and collaboration between business units and the organization's cybersecurity program.

IFSM 330: Business Intelligence and Data Analytics (3 credits)
Recommended: IFSM 201. A hands-on, project-based introduction to databases, business intelligence, and data analytics. The aim is to design secure industry-standard databases and utilize business intelligence and data analytics techniques and technologies to support decision making. Topics include data and relational databases, SQL queries, and business intelligence tools, including alignment with business strategy.

DATA 331: Data Visualization (3 credits)
Prerequisites: DATA 220, DATA 330. A presentation of the fundamentals of data visualization principles in the context of business and data science. Practical focus on data visualization of different data types including time-series, multidimensional data, creating dynamic tables, heatmaps, infographs, and dashboards. Hands-on projects will require exploring data visually at multiple levels to find insights to create a compelling story and incorporating visual design best practices to better communicate insights to the intended audience, such as business stakeholders. Projects are selected from a wide range of content areas such as retail, marketing, healthcare, government, basic sciences, and technology.

CMSC 437: Machine Learning (3 credits)
Prerequisite: DATA 300. A hands-on introduction to the Machine Learning principles and methods that can be applied to solve practical problems. Topics include supervised and unsupervised learning with focus on linear regression, logistic regression, decision tree, naïve Bayes and clustering analysis. Focus is

on using data from a wide range of domains such as healthcare, finance, marketing, and government to build predictive models, applied to make informed decisions. Additional topics include the handling of missing data, performing cross-validation to avoid overtraining, evaluating classifiers, and measuring precision.

DATA 440: Advanced Machine Learning (3 credits)
Prerequisites: CMSC 437, MATH 140. A project-based study of advanced concepts and applications in machine learning such as neural networks, support vector machines (SVM), ensemble models, deep learning, and reinforced learning. The emphasis is on building predictive models for practical business and social problems, developing complex and explainable predictive models, assessing classifiers and comparing their performance. All stages of the machine learning life cycles are developed, following industry best practices for selecting methods and tools to build ML models, including Auto ML.

DATA 445: Advanced Data Science (Big Data) (3 credits)
Prerequisites: DATA 331, DATA 437. A project-based introduction to the concepts, approaches, techniques and technologies for managing and analyzing large data sets in support of improved decision-making. The course will employ technologies such as Spark, Hive, Pig, Kafka, Hadoop, HBase, Flume, Cassandra, cloud analytics, container architectures, and streaming real-time platforms. Additional topics include how to identify the kinds of analyses to use with big data and how to interpret the results.

CMSC 447: Artificial Intelligence Solutions (3 credits)
(Designed to help prepare for the AWS Certified Machine Learning or Microsoft Designing and Implementing an Azure AI Solution exam.) Prerequisite: CMSC 437. A hands-on, project-based study of artificial intelligence and machine learning solutions to complex problems. Topics include natural language processing, computer vision, and speech recognition.

DATA 450: Data Ethics (3 credits)
Prerequisite: CMSC 437. Recommended: CSIA 300. A study of ethics within the context of data science, machine learning and artificial intelligence. The emphasis is on examining data and model bias, building explainable, fair, trustable, and accurate predictive modeling systems, and on reporting responsible results. Additional topics include the technology implications of human-centered machine learning and artificial intelligence on decision-making in organizations and government and the broader impact on society, including multinational and global effects.

DATA 495: Capstone
Prerequisites: DATA 440, DATA 445, DATA 450. The course requires completion of a major analytics project designed to apply the knowledge, technical skills, and critical thinking skills acquired during the degree program that can showcase the student's data science expertise to prospective employers. Projects are completed individually, including all phases of machine learning life cycles, and include a peer reviewed final report and presentation. Topics are selected from student-affiliated organizations or employers, special government/private agency requests, or other faculty approved sources in a wide range of domains such as healthcare, financial services, marketing, sciences and government.

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

All UMGC undergraduate students are required to complete 41 credit hours in general education requirements. These requirements include courses in writing and communications, arts and humanities, social and behavioral sciences, natural sciences, mathematics, technology, and research. See Appendix B for the Bachelor of Science in Data Science Degree Planning Course Sequence Sheet, which includes required major and related courses, and required and recommended General Education courses.

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

   N/A

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

   N/A

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 systems, availability of academic support services and financial aid resources, and costs and payment policies.**

   UMGC maintains a comprehensive website that houses all updated information about its programs. Students will have access to degree requirements, course catalogs, course schedules, and other pertinent information about the program.

   The website also provides specific and clear information about technology requirements for UMGC students, information and training on the learning management system, and other resources to maximize students' learning experience.

   A variety of support services are available to students for academic assistance (Tutoring, Writing Center), as well as technical support and financial aid.

   UMGC students are guided by the Student Handbook that is available online and serves as a general guide for all current and prospective students.

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.**

   All Bachelor of Science in Data Science program-related communications (advertising, recruiting and admission materials) are done in conjunction with UMGC-wide institutional communication strategy, which adheres to the principle of truth in advertising. All written and electronic materials prepared for prospective students for purpose of recruitment will accurately and clearly represent the courses, the program, and services available.

H. **Adequacy of Articulation**
   1. **If applicable, discuss how the program supports articulation with programs at partner institutions. Provide all relevant articulation agreements.**

      UMGC has a number of existing articulations with community colleges, both within the state of Maryland and nation-wide, in computing and IT, reflecting the national and international reach of our service capacity. UMGC has a flexible and convenient transfer policy – accepting up to 70 credits from community colleges – and we also offer a "completion scholarship," whereby students who complete their 2-year degree at a local community college are guaranteed admission to UMGC as well as a tuition rate which will allow recipients of the scholarship to complete the four-year degree for $12,000 or less. New articulations can easily be created between the proposed B.S. program and Data Science-related programs offered by community colleges, offering students from these community college a seamless pathway to a four-year degree in Data Science.

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I. Adequacy of Faculty Resources (as outlined in COMAR 13B.02.03.11).
  1. **Provide a brief narrative demonstrating the quality of program faculty. Include a summary list of faculty with appointment type, terminal degree title and field, academic title/rank, status (full-time, part-time, adjunct) and the course(s) each faculty member will teach in the proposed program.**

  UMGC's model employs full-time faculty (known as collegiate faculty) in faculty leadership roles, such as Department Chairs and Program Directors, with responsibility for the overall intellectual coherence and integrity of the program. Other collegiate faculty teach and serve in complementary roles that maintain and support the academic programs, providing input into the design and content of the program and their courses. This core group of full-time collegiate faculty will support the Adjunct faculty in teaching the program courses.

  In keeping with UMGC's emphasis on workplace relevance, the Bachelor of Science in Data Science teaching faculty will be practicing professionals who teach part-time for UMGC. These adjunct faculty provide instruction for the majority of courses (which is true for all programs at all levels at UMGC). This model is responsible for one of UMGC's greatest strengths: scholar-practitioner faculty who have solid academic credentials and continue to work outside the university, providing a continuous infusion of current workplace knowledge, career-relevant perspectives, and maximum flexibility for adapting to changing student demand and rapidly changing industries and technologies. In this way, UMGC supports students in a learning experience that is practical and relevant to today's competitive and evolving global marketplace. Many adjuncts have considerable experience with UMGC. Collegiate and adjunct faculty both hold academic rank and title, based on their academic qualifications and professional experience, including teaching experience at UMGC. Since 1996 UMGC has held a MHEC-approved waiver of the Code of Maryland (COMAR) requirements for total credit hours taught by full-time faculty (Appendix A).

  The centrality and appropriateness of UMGC's faculty model relative to its educational mandate and mission were reaffirmed by MHEC in its 2016 review of mission statements, as evidenced in the following excerpt from the Commission's report:

  > UMUC intentionally seeks highly-qualified full-time and adjunct faculty who have hands-on experience in the disciplines they teach and who can leverage that experience to provide a richer learning experience for students. The university's mission to serve adult students is supported by adjunct faculty who are scholar-practitioners engaged daily in their profession. The ability to employ adjunct faculty is critical to UMUC's capacity to quickly deploy academic and continuing education programs in response to workforce-related needs. This entrepreneurship and flexibility in establishing new programs is particularly important to the university: given its history of very limited state support, the university's financial model is based on tuition revenues, and all programs must be self-supporting.[15]

  Consistent with this model, UMGC has a substantial roster of faculty with expertise in areas related to Data Science. Teaching effectiveness is monitored by class observation, student course evaluations, and program-specific, student-level competency assessment. The School of Cybersecurity and Information Technology already has an active unit of faculty qualified and prepared to teach courses in the proposed program and we constantly recruit additional faculty.

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[15] Source: Maryland Higher Education Commission (December 2015), Mission Statement Review: http://mhec.maryland.gov/institutions_training/Documents/acadaff/2016MissionStatementReview.pdf

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The following is a partial list of faculty with their graduate degree title(s), academic title/rank, and the courses they will teach:

Name	Appointment Type and Rank	Graduate Degree(s), and Field	Status	Course(s) to be Taught
Elena Gortcheva	Program Director/ Collegiate Professor	PhD, Computer Engineering	Full-time	DATA 440, DATA 445, CMSC 447, CMSC437 DATA 450, DATA 495
Christopher Schultz	Collegiate Professor	PhD, Educational Thought and Sociocultural Studies; MBA; MS Computer Science	Full-time	IFSM 201, DATA 220, IFSM 330, DATA 331, DATA 450, DATA 495
TBD	Collegiate Faculty	TBD	Full-time	TBD
Caroline Beam	Adjunct Professor	PhD, Operations Research	Adjunct	DATA 300, DATA 331
Charles Knode	Adjunct Professor	PhD, Industrial Technology	Adjunct	DATA 440, DATA 450, CMSC 447, DATA 495
Solomon Britto	Adjunct Assistant Professor	DBA, Doctor of Business Administration	Adjunct	IFSM 201, DATA 220
Jon Brundage	Adjunct Professor	PhD, Information Technology	Adjunct	IFSM 201, DATA 220
Aaron Ferguson	Adjunct Professor	PhD, Applied Mathematics and Statistics	Adjunct	IFSM 201, DATA 220, IFSM 330, CMSC 437, DATA 440
Michele A. Washington	Adjunct Professor	PhD, Information Systems	Adjunct	IFSM 201, DATA 220
Edward Herranz	Adjunct Associate Professor	PhD, Computer Science	Adjunct	DATA 300, CMSC 437, DATA 447, DATA 445
Firdu Batti	Adjunct Associate Professor	PhD, Computer Science	Adjunct	DATA 300, CMSC 437, DATA 447, CMSC 447

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**

UMGC is committed to providing pedagogy training in support of student learning throughout the faculty life cycle with the institution. FACDEV 411, our required New Faculty Academic Orientation, is a two-week, facilitated online training that covers the history of UMGC, pedagogy of adult learning, facilitating online learning, and providing additional support for students through UMGC's Library, Effective Writing Center, and Office of Accessibility Services. Parallel required training courses exist for faculty teaching hybrid courses.

In addition, faculty members have access to just-in-time professional development opportunities such as our bi-monthly webinars; self-paced workshops on pedagogical and LMS-related matters; quick guides on online classroom support and technology; and a variety of Skillsoft courses.

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b) **The learning management system**

UMGC provides multiple touchpoints to ensure thorough orientation to and continued education about our Learning Management System (LMS), Desire2Learn. Building on the materials provided in FACDEV 411, UMGC offers workshops on grading strategies; the integration of audio and video feedback to students; gradebook setup and rubrics; crafting powerful introductions; open educational resources (OERs) used in the classroom; and netiquette.

In addition, many webinars directly amplify the skills needed by faculty members to be successful in the online classroom, e.g., recursive feedback; scaffolding student learning; digital literacy; classroom assessment techniques; creating a more engaging classroom; etc.

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

Besides the strategies outlined above, UMGC has recognized the need to equip faculty more comprehensively with skills and abilities to enhance engagement and coaching, in order to improve student learning and retention.

To that end, UMGC has developed a coaching training that will be made available to all UMGC faculty in Feb. 2021, well before the proposed launch of the proposed new program (Spring 2022). Faculty teaching in this program will therefore benefit from this training. This new faculty training course, FACDEV 111—Coaching and Providing Feedback that Matters—will provide coaching skills to create an active and motivating presence in the classroom in order to establish helpful and supportive relationships with each student leading to persistence and academic success.

This addition to our training catalog will diminish the distance between faculty and students inherent in online courses by providing specific strategies and tactics to facilitate regular interaction and outreach and personalized and actionable coaching and feedback.

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.**

No new library resources are needed to serve the Bachelor of Science in Data Science. The UMGC Library provides access to a vast array of library resources and services to UMGC students, faculty, and staff worldwide to meet their academic needs and includes a wide and varied collection of journal articles, reports, case studies, and, in some instances, complete books available electronically via a comprehensive selection of online library databases. Library services include instruction, reference, electronic reserves, and document delivery for materials not otherwise available in the library databases. The UMGC Library relies on distributed technology as its primary mechanism to provide online access to resources and services to UMGC's widely dispersed, working-adult student population.

The curated collection of online academic research databases available to UMGC faculty and students provides access to hundreds of thousands of full-text articles as well as reports, statistics, case studies, book chapters, and complete books in a wide range of subject areas. In addition, students have access to the full text of dissertations and theses via the *ProQuest Dissertations and Theses* database. The Library assists faculty and learning designers in providing links to Library materials directly in online classes.

The UMGC Library also offers other resources and services. UMGC students, faculty, and staff within the continental United States have access to more than ten million volumes in print from the 16-member University System of Maryland and Affiliated Institutions (USMAI) library consortium. The UMGC Library offers document delivery services to all UMGC students, faculty, and staff worldwide for a variety of materials, including journal articles and book chapters. UMGC's expanding collection of 75,000 electronic books (e-books) has significantly increased the ability to meet the needs of UMGC's global population.

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The UMGC Library provides faculty and students with research assistance in creating search strategies, selecting relevant databases, and evaluating and citing sources in a variety of formats via its *Ask a Librarian*, which includes 24/7 chat and email. A guide to locating scholarly articles and using UMGC's library databases. The UMGC Library *OneSearch* tool allows users to simultaneously search for scholarly articles, books, and/or other research resources via a single search engine in most of the databases to which the UMGC Library subscribes, either directly or as additional resources.[16] In addition, UMGC faculty can request customized library instruction sessions for both on-site and online classes, and can also add UMGC Library tutorials and materials to their learning management system classrooms and refer students to them through the Web gateway.

A librarian liaison assigned to each academic department assists faculty with resource identification and other program needs. The Subject Guides area of the library's web site provides a listing of resource guides for each subject area, with each guide containing relevant databases, Web sites, books, and other resources along with technical and citation assistance.

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.**

    The proposed Bachelor of Science in Data Science will primarily be offered online using a distance education platform. Existing resources related to facilities, infrastructure, and equipment are adequate to meet the Bachelor of Science in Data Science needs.

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

    UMGC has an internal email network that provides all incoming students and all faculty with consistent email domains @student.umgc.edu and @faculty.umgc.edu respectively. Students are encouraged but not limited to using this email address in all their communication with the university. Faculty are required to use their UMGC addresses for all their official UMGC communications.

    UMGC's standard learning management system is Desire2Learn (D2L). All UMGC classes are taught using this system and all the students with appropriate technology and online access (referenced in section G8) have access to this system through their learning portal. Support is available for students and faculty through a 24/7 help desk and a large variety of online help resources on UMGC's website.

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.**

    Narrative Rationale
    No new general funds are required for implementation of this program. The financial table that follows is based only on students entering the new program.

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[16] Source: UMGC Library, 2020: http://sites.umgc.edu/library/index.cfm

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As shown in Tables 1 and 2 below, the program is expected to be self-supporting from inception. UMGC's existing base of FTE faculty and administrative and support staff will be utilized to support and serve the Bachelor of Science in Data Science.

For the resource category 2.e, note that only instate tuition is considered.

TABLE 1:RESOURCES

Resource Categories	Year1	Year2	Year 3	Year4	Year 5
1. Reallocated Funds	0	0	0	0	0
2. Tuition/Fee Revenue (c + g below)	$450,000	$675,000	$900,000	$1,125,000	$1,125,000
a. Number of F/T Students	0	0	0	0	0
b. Annual Tuition/Fee Rate	N/A	N/A	N/A	N/A	N/A
c. Total F/T Revenue (a x b)	N/A	N/A	N/A	N/A	N/A
d. Number of P/T Students	50	75	100	125	125
e. Credit Hour Rate	$300	$300	$300	$300	$300
f. Annual Credit Hour Rate	30	30	30	30	30
g. Total PIT Revenue (d x e x f)					
3. Grants, Contracts & Other External Sources	0	0	0	0	0
4. Other Sources	0	0	0	0	0
TOTAL (Add 1 - 4)	$450,000	$675,000	$900,000	$1,125,000	$1,125,000

2. **Complete Table 2: Program Expenditures 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 expenditure category.**

Narrative Rationale
The data below for faculty, staff, and technical support and equipment is based on UMGC's existing base of FTE faculty and administrative and support staff who will be utilized to support and serve the Bachelor of Science in Data Science, as well as existing technical support and equipment.

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In category 1.b, the adjunct faculty salary is the median salary for an adjunct associate faculty member with a terminal degree at longevity step 11. In category 7, the expenditure listed is for course development.

TABLE 2: PROGRAM EXPENDITURES:					
Expenditure Categories	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**
1. Faculty (b + c below)	$80,697.06	$121,045.60	$161,394.10	$201,742.70	$201,742.70
a. Number of FTE sections	18	27	36	45	45
b. Total Salary (Adjunct salary at $1371 per credit hours)*	$74,034	$111,051	$148,068	$185,085	$185,085
c. Total Benefits (9%)	$6,663.06	$9994.59	$13,326.12	$16,657.65	$16,657.65
2. Admin.Staff (b + c below)	$123,300.00	$123,300.00	$123,300.00	$123,300.00	$123,300.00
a. Number of FTE	1	1	1	1	1
b. Total Salary	$90,000	$90,000	$90,000	$90,000	$90,000
c. Total Benefits (37%)	$33,300.00	$33,300.00	$33,300.00	$33,300.00	$33,300.00
3. Support Staff (b+c below)	$34,250.00	$34,250.00	$34,250.00	$34,250.00	$34,250.00
a. Number of FTE	.5	.5	.5	.5	.5
b. Total Salary	$25,000	$25,000	$25,000	$25,000	$25,000
c. Total Benefits (37%)	$9,250.00	$9,250.00	$9,250.00	$9,250.00	$9,250.00
4. Technical Support and Equipment	$80,000	0	0	0	0
5. Library	0	0	0	0	0
6. New or Renovated Space	0	0	0	0	0
7. Other Expenses (course development)	$70,000	0	0	0	0
TOTAL (Add 1 – 7)	**$388,247.06**	**$278,595.59**	**$318,944.12**	**$359,292.65**	**$359,292.65**

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.

UMGC has created an annual program review process that includes assessment of student learning as described earlier along with non-direct measures of student learning including student course evaluations, student retention and graduation rates, and student program surveys administered in capstone courses. As part of this process, external data is collected, including enrollment in related programs at other institutions and trends in labor markets. UMGC's mission for career relevant education requires that program learning goals and curriculum are maintained in the context of changing needs in labor markets and required skills for graduates.

As part of the annual program review, courses within the program portfolio are reviewed for course health. This includes student success rates within courses and course reenrollment rates (how many students in a course re-enroll in the following term). In addition, student course evaluations are administered every term for every course. Data are aggregated in academic dashboards at the course level to allow faculty to evaluate the effectiveness of course curriculum and delivery. When a course is scheduled for revision, faculty teaching the course are surveyed to provide input to the faculty and instructional designers revising the course.

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UMGC is in the process of adopting Quality Matters for course evaluation. As that process rolls-out, courses will be reviewed on a regular basis against the Quality Matters rubric to ensure quality of course materials and design.

Full-time faculty are reviewed at least every two years. Part-time faculty are reviewed on a course/semester basis. The student course evaluation provides an opportunity for faculty to receive both quantitative and qualitative feedback on their teaching.

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.**

Faculty, administrators, and the Office of Academic Quality collaborate to implement and monitor assessment activities, review results, and make appropriate resource, curriculum, or other modifications. Annually, student performance across learning demonstrations is evaluated to determine where improvements may be required. Changes are made to curriculum and/or student support models. The process supports a continuous cycle of improvement.

Additional evaluation includes tracking of student retention, grade distributions and cost-effectiveness. Regular academic program reviews consider all factors related to academic quality, curriculum currency and relevance, student support and adequacy of facilities.

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.**

UMGC seeks to reflect the diversity of the global community it serves. Cultural differences are recognized, valued, and considered essential to the educational process. UMGC provides an academic environment in which diversity is not only articulated as one of the institutional core values, but it is reflected in the university's ethnically and racially diverse student body and its proven record of providing higher education access to minority students. The university's Digital Teaching and Learning unit collaborates with UMGC's Office of Diversity and Equity to ensure a robustly inclusive curriculum that is built around UMGC's focus on project-, scenario-, and problem-based learning, which learning science has shown to more adequately respond to the learning approaches most effective for adult students. Additionally, the School of Cyber and IT is undertaking a focused initiative, in collaboration with the Office of the Chief Digital Officer, to specifically enhance inclusion in the School's offerings, starting with the diversity of perspectives and identities reflected in the projects that anchor the School's curriculum.

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.**

   N/A

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

   University of Maryland Global Campus has been approved to offer distance education by the Middle States Commission on Higher Education (MSCHE) and maintains compliance with COMAR

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13B.02.03.22. UMGC is approved to offer distance education as an alternative delivery method included within its scope of accreditation, as evidenced in the university's MSCHE Statement of Accreditation Status. Furthermore, among its many recognitions, as of 2016 UMGC had received five Sloan Consortium (now Online Learning Consortium) Excellence Awards for online program quality and three IMS Global Learning Consortium awards for technology integration in the classroom environment.

Historically, UMGC was an early provider of off-campus educational opportunities for students and one of the first universities in Maryland to develop online education. UMGC has been a leader among public institutions in providing quality and affordable online education and has been providing distance education to residents of the state of Maryland, to the nation's service members, and to those who live outside of Maryland for more than seventy years. Additionally, UMGC's Europe and Asia divisions offer hybrid and onsite classes to fulfill contract requirements and meet the needs of military students overseas. Stateside, all onsite classes, with the exception of an occasional accelerated offering, are in hybrid format, blending onsite and online delivery.

UMGC's distance education offerings are in compliance with C-RAC's 2011 Guidelines.

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Appendix A

90.2.1.001

Robert L. Ehrlich, Jr.
Governor

Michael S. Steele
Lt. Governor

CC: LEL
Bob J.

John J. Oliver, Jr.
Chairman

Calvin W. Burnett
Secretary of Higher Education

MHEC
Creating a state of achievement

MEMORANDUM

DATE: January 6, 2005

Office of the Provost
UMUC

TO: Dr. Nicholas H. Allen
           Provost and Chief Academic Officer, UMUC

JAN 1 0 2005

FROM: Michael J. Kiphart, Ph.D. *MJK*
           Assistant Secretary for Planning and Academic Affairs

SUBJECT: UMUC Waiver of Full-Time Faculty and Library/Learning Resources Center

According to our records, UMUC's request for a waiver of full-time faculty and library/learning resource center went before the Education Policy Committee on January 16, 1996. The Education Policy Committee approved for the University a waiver of the definition of full-time faculty and library/learning resource center as provided for in the Commission's *Minimum Requirements for Degree-Granting Institutions,* and further, that the Commission instruct the Secretary of Higher Education to review the University at regular intervals to assure that the University was in compliance with the applicable provisions of the waiver to the minimum requirements.

On February 15, 1996, the matter went before the Commission and an amended recommendation was approved. The Commission approved for the University a waiver of the requirements for total credit hours taught by full-time faculty and for a waiver of the requirements for a minimum library collection for the Library/Learning Resource Center as provided for in the Commission's *Minimum Requirements for Degree-Granting Institutions.* Further, the Commission instructed the Secretary of Higher Education to review the University at regular intervals to assure that the University was in compliance with the applicable provisions of the waiver to the minimum requirements. The Commission also approved a recommendation that the Faulty Advisory Council and Student Advisory Council recommendations be referred to the University of Maryland System Board of Regents.

Enclosed are documents supporting the approval of the waiver. Should you require additional assistance, please contact David Sumler, Director of Academic Affairs – Planning and Policy, at 410-260-4533 or dsumler@mhec.state.md.us.

MJK:aaw
Enclosures

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cc: a filer

Forward thing for appropriate action

VR

Comm. on 6/8

Policy

RECEIVED
APR 30 1996
By *VCAA*

April 23, 1996

RECEIVED

APR 29 1996

OFFICE OF THE CHANCELLOR
THE UNIVERSITY OF MARYLAND
SYSTEM

Parris N. Glendening
Governor

Edward O. Clarke, Jr.
Chairman

Patricia S. Florestano
*Secretary of
Higher Education*

Mr. Lance W. Billingsley, Esq.
Chairman, Board of Regents
University of Maryland System
3300 Metzerott Road
Adelphi, MD 20783

Dear Mr. Billingsley:

At its February 15, 1996 meeting, the Maryland Higher Education Commission considered a request by University of Maryland University College for a waiver of the Commission's minimum requirements in the area of full-time faculty and library resources. The Commission has granted the waiver.

In the discussion of the waiver and related issues, both the Faculty Advisory Council and the Student Advisory Council to the Commission raised issues which the Commission felt were more appropriately addressed by the University of Maryland's governing board. Therefore, I am forwarding to you the resolutions submitted to the Commission by these two advisory councils, in addition to the relevant materials considered by the Commission in granting the waivers.

Consistent with the final recommendations of the Commission on this matter, I would appreciate a review of these issues by the Board of Regents. I would also appreciate receiving the results of that review when it is completed. Since the academic year is coming to a close, I realize that any reaction on the part of the Board of Regents may be delayed until next fall. In light of that schedule, could you please supply the Commission with the Board of Regents' position by November 1, 1996.

Sincerely,

Edward O. Clarke, Jr.
(ст)

Edward O. Clarke, Jr.
Chairman

EOC:PSF:JAS:ds

Enclosures

cc: Dr. Patricia S. Florestano
√ Dr. Donald N. Langenberg

16 Francis St., Annapolis, MD 21401-1781 ▌ (410) 974-2971 ▌ FAX (410) 974-3513
TTY for the Deaf: (800) 735-2258

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Appendix B
UMGC Data Science Degree Planning Course Sequence Sheet
Bachelor of Science in Data Science

This sheet is designed to give an overview of the bachelor's degree requirements at UMGC. Every student's plan is unique to them based on their previous education. For full course descriptions and an overview of all requirements, please refer to the current UMGC catalog. A minimum of 30 credits must be earned at UMGC including at least half of the major/minor; 36 credits must be upper level including half of the credit in the major/minor. Please contact UMGC with all questions in regard to your official degree plan. Degree requirements may change based on the date of initial enrollment at UMGC.

Course Sequence	Term/ Session Taken	Recommended Course	Level	Course Note	Alternative Course(s)
1		LIBS150 (1)	GE	Recommended Research Gen Ed	CAPL 398A
2		PACE111 (3)T	GE	Required Research Gen Ed	Any PACE 111
3		WRTG111 (3)	GE	Recommended Communication Gen Ed	Any other WRTG
4		IFSM201 (3)	GE	Required Computing Gen Ed; Pre-req to Major	N/A
5		CMIS102 (3)	Elective	Related Required Course; Pre-req to Major	N/A
6		STAT200 (3)	GE	Required Math Gen Ed; Pre-req to Major	N/A
7		WRTG112 (3)	GE	Required Communication Gen Ed	N/A
8		DATA220 (3)	Major	Required Major Course	N/A
9		DATA300 (3)	Major	Required Major Course	N/A
10		IFSM330(3)	Major	Required Major Course	N/A
11		BIOL103 (4)	GE	Recommended Bio/Phys Sci Gen Ed with required LAB	Any other ASTR, BIOL, CHEM, GEOL, NSCI, NUTR, or PHYS with LAB
12		DATA331 (3)	Major	Required Major Course	N/A
13		MATH140 (4)	Elective	Related Required Course	N/A
14		BEHS103 (3)	GE	Recommended Beh/Soc Sci Gen Ed	Any other AASP (201 only), ANTH, ASTD, BEHS, CCJS (100, 105, 350, 360, 461 only), ECON, GEOG, GERO (except 342 and 351), GVPT, PSYC, SOCY, or WMST (200 only)

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15		CMSC437 (3)	Major	Required Major Course	N/A
16		ARTH334 (3)	GE	Recommended HU/Arts Gen Ed	Any other ARTH, ARTT, ASTD, ENGL (except ENGL 281 and ENGL 384), GRCO, HIST, HUMN, MUSC, PHIL, THET, dance, literature, or foreign language
17		NUTR100 (3)	GE	Recommended Bio/Phys Sci Gen Ed	Any other ASTR, BIOL, CHEM, GEOL, NSCI, NUTR, or PHYS
18		SPCH100 (3)	GE	Recommended Communication Gen Ed	Any other WRTG/SPCH/COMM
19		HIST125 (3)	GE	Recommended HU/Arts Gen Ed	Any other ARTH, ARTT, ASTD, ENGL (except ENGL 281 and ENGL 384), GRCO, HIST, HUMN, MUSC, PHIL, THET, dance, literature, or foreign language
20		Elective (3)	Elective	Elective	
21		ECON103 (3)	GE	Recommended Beh/Soc Sci Gen Ed	Any other AASP (201 only), ANTH, ASTD, BEHS, CCJS (100, 105, 350, 360, 461 only), ECON, GEOG, GERO (except 342 and 351), GVPT, PSYC, SOCY, or WMST (200 only)
22		CSIA300 (3)	Major	Required Major Course	N/A
23		Elective (3)	Elective	Elective	
24		DATA450 (3)	Major	Required Major Course	N/A
25		Elective (3)	Elective	Elective	
26		CMSC447 (3)	Major	Required Major Course	N/A
27		WRTG393 (3)	GE	Recommended Communication Gen Ed	Any other Upper-level WRTG
28		Elective (3)	Elective	Elective	
29		DATA440(3)	Major	Required Major Course	N/A
30		Elective (3)	Elective	Elective	
31		Elective (3)	Elective	Elective	

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32		DATA445 (3)	Major	Required Major Course	N/A
33		Elective (3)	Elective	Elective	
34		Elective (3)	Elective	Elective	
35		Elective (3)	Elective	Elective	
36		Elective (3)	Elective	Elective	
37		Elective (3)	Elective	Elective	
38		Elective (3)	Elective	Elective	
39		DATA495 (3)	Major	Required Major Course	N/A
40		Elective (3)	Elective	Elective	

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Appendix C
Mapping of Program learning Goals for the B.S. program to core courses in the major

	DAT A 220	DAT A 300	IFSM 330	DAT A 331	CSIA 300	CMSC 437	CMSC 447	DATA 440	DAT A 445	DAT A 450	DAT A 495
1. Communicate effectively in writing and orally to diverse audiences, utilizing storytelling techniques, when appropriate, to convey the data science process and results.	X	X	X	X	X	X	X	X	X	X	X
2. Plan, design, and implement the data mining process (machine learning life cycles), including data extraction, data cleaning, data load, and transformation.	X	X				X		X			X
3. Demonstrate proficiency with diverse technologies used within data science, business intelligence, machine learning and artificial intelligence.	X	X	X	X		X	X	X	X	X	X
4. Analyze social, global and/or ethical issues and implications related to the use of existing and emerging data science, machine learning and/or artificial intelligence technologies.	X		X			X	X	X	X	X	X
5. Evaluate a business problem or opportunity to determine the extent data science can provide a viable solution and translate the business problem into a viable project to meet organizational strategic and operational needs.		X	X	X		X		X	X		X
6. Incorporate data security, data privacy and risk management best practices in the planning, development and implementation of data science solutions.					X	X	X	X	X	X	X
7. Evaluate the appropriate methods and technology for data science in specific organizational contexts, including selecting a modeling approach, building a model using appropriate technology, validating the model, and deploying the model for prediction and analysis.						X		X	X	X	X
8. Create solutions leveraging big data analytics and AI							X	X	X		X

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technology for stream analytics, text processing, natural language understanding, AI and cognitive applications.				131						
9. Collaborate with team members to plan, evaluate, implement, and document data science solutions.						X		X	X	X

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 UNIVERSITY SYSTEM *of* **MARYLAND**

BOARD OF REGENTS
SUMMARY OF ITEM FOR ACTION,
INFORMATION, OR DISCUSSION

TOPIC: Post-Approval Academic Program Review Reports and Forthcoming Reviews

COMMITTEE: Education Policy and Student Life

DATE OF COMMITTEE MEETING: Friday, March 5, 2021

SUMMARY: Annually a number of program reviews are presented to the Regents after the approval of academic programs. They include:

- New Programs 5-Year Enrollment Reviews
- Report on Periodic Reviews (7-Years) of Academic Programs; and
- Report on Academic Program Actions Delegated to the Chancellor.

Dr. Antoinette Coleman, Associate Vice Chancellor for Academic Affairs, will review specifics of these processes and share plans for forthcoming reviews to help ensure the viability of academic programs and the efficiency of the Board's role in the aforementioned reviews.

ALTERNATIVE(S): This is an information item.

FISCAL IMPACT: This is an information item.

CHANCELLOR'S RECOMMENDATION: This is an information item.

COMMITTEE ACTION: Information Only   DATE: March 5, 2021

BOARD ACTION: DATE:

SUBMITTED BY: Joann A. Boughman   301-445-1992   jboughman@usmd.edu

Post-Approval Academic Program Reviews

Current and Future Reviews

03/05/2021

UNIVERSITY SYSTEM *of* **MARYLAND**

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Post-Approval Academic Program Reviews

New Programs 5-Year Enrollment Reviews

Periodic Reviews (7-Year) of Academic Programs

Academic Program Actions Delegated to the Chancellor

New Programs 5-Year Enrollment Reviews

- Board of Regents initiated reviews in 2014

- Currently EPSL receives reviews as information only

- The progress between the projected and actual enrollments of the program are reviewed

- Reviews begin 1st fall semester after program approval

- Programs are reviewed annually for a five-year period

Example

New Program Enrollment Review Fall 2016 - Fall 2020

Inst.	HEGIS	Program Name	Degree Level	Approved	Enrollments									
					Fall 2016		Fall 2017		Fall 2018		Fall 2019		Fall 2020	
					Projected	Actual	Projected	Actual	Projected	Actual	Projected	Actual	Projected	Actual
UMB	120100	Palliative Care [1]	MS	6/10/16	20	**0**	50	**61**	63	**119**	64	**108**	68	**116**
UMCP	070101	Information Science	BS	10/6/15	50	**91**	100	**367**	150	**709**	200	**959**	200	**1160**
UMCP	050300	Business Analytics	MS	4/15/16	30	**0**	30	**74**	40	**161**	41	**209**	42	**201**
UMCP	210200	Public Policy [2]	BA	6/10/16	50	**0**	100	**78**	200	**162**	300	**219**	300	**270**

[1]   The M.S. in Palliative Care has exceeeded its projected enrollment beginning in Fall 2017

[2]   UMCP BA in Public Policy: Primary major headcount in Fall 2019 was 219, but count of all majors (including double majors) was 268

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Periodic Reviews (7-Year) of Academic Programs

- Established by COMAR 13B.02.02.15 and 13B.02.03.17

- Currently, programs are reviewed every 7 years after approval

- Reviews comprise enrollments and degrees awarded, internal self-study and external reviews, inclusive of accreditation self-study when applicable, and institutional recommendations and actions at all academic levels

- USM Office of the Senior Vice Chancellor for Academic and Student Affairs provides review and submits to the Chancellor for approval and submission to EPSL

- Currently, reviews are presented as information only to EPSL

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Example

Periodic Reviews (7-Year) of Academic Programs, 2019-2020

Program Title (Degree)	University of Maryland Global Campus									
	2015		2016		2017		2018		2019	
	Enrolled	Degrees	Enrolled	Degrees	Enrolled	Degrees	Enrolled	Degrees	Enrolled	Degrees
Digital Media and Web Technology (B)	529	106	496	101	499	93	539	119	540	119
Finance (B)	539	78	648	97	710	15	822	134	799	124
Foreign Language Area Studies (UDC)	80	67	102	52	118	55	136	71	138	48
Homeland Security (B)	383	131	209	92	114	61	204	33	508	38
Psychology (B)	2484	437	2469	417	2620	387	2713	469	2847	437
Spanish for Business and the Professions (UDC)	30	14	30	18	34	8	42	12	35	8

Notes:
1. The Digital Media and Web Technology (B) program has consistently met the highly specialized, rapidly changing needs of the industry.
2. The Finance (B) program has shown progressively increasing enrollments while maintaining a strong learning experience for students.
3. The Foreign Language Area Studies (UDC) program has been running successfully for over two decades and has proven to be particularly valuable for military students and their families stationed overseas.
4. The Homeland Security (B) programs meets the needs for a foundation of knowledge and emergency management skills for entry-level homeland security positions.
5. The Psychology (B) program shows strength in leadership, support, curriculum and enrollments.
6. The Spanish for Business and the Professions (UDC) program will continue to be evaluated in relation to market demands, improve the quality of student learning, and improve faculty involvement.

University System of Maryland

Academic Program Actions Delegated to the Chancellor

- BOR Policy III-7.03 affords approval of program actions leading to the award of:

  - A graduate or undergraduate certificate,

  - Any new BTPS program, any substantial expansion or modification of an existing academic program, and

  - Any suspensions and discontinuances of existing degree programs.

- An annual report on academic program actions is given to the Board of Regents Committee on Education Policy and Student Life.

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Example

Academic Program Actions Delegated to the Chancellor, 2019 - 2020

Institution	Chancellor's Actions		
	Discontinued or Suspended Concentrations and Programs	**New Certificates and Concentrations/Modified Programs and Degree Changes**	**Title Changes**
University of Maryland, Eastern Shore	Suspend B.A. in Jazz and Popular Music (5-18-2020) Suspend B.A. in Music Education (5-18-2020) Discontinue B.S. in Business Education (5-18-2020) Discontinue A.O.C. in Mechanical Engineering in B.S. in Engineering Technology (4-6-2020) Discontinue Additional Locations: 1) Allegany Career Technology Center (2-24-2020), 2) Community College of Baltimore County – Catonsville (2-24-2020), and 3) Frederick Community College (2-24-2020)	B.S. in Aviation Science- Substantial Modification to offer at Prince George's Community College (11-4-2020)	B.S. in Computer Science/Data Processing to Computer Science (10-28-2019) B.S. in Construction Management/ Technology to Construction Management Technology (10-28-2019) B.S. in Elementary/Special Education to Special Education (6-26-2020) M.S. in Clinical Rehabilitation Counseling to Rehabilitation Counseling (8-17-2020)

UNIVERSITY SYSTEM
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Current program review processes . . . .

Each of the program reviews is an independent process. Using the information gathered from these distinct reviews, the individual institutions determine the outcome of their programs.

Academic Program Actions Delegated to the Chancellor

Periodic Reviews (7-Year) of Academic Programs

New Programs 5-Year Enrollment Reviews

Board of Regents
Policy III-7.03
Eff. - June 18, 2003
https://www.usmd.edu/regents/bylaws/SectionIII/III703.html

MHEC - COMAR:
Adequacy of Provision for Evaluation of Programs:
COMAR 13b.02.03.15
Low Productivity Programs:
COMAR 13b.02.03.17

Board of Regents
EPSL Committee
Eff. - January 2014

03/05/2021

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Next steps for the reviews of academic programs . . . .

As recommended by the Board of Regents Committee on Education Policy and Student Life on January 12, 2021, an Academic Advisory Committee will convene to define more frequent reviews of low productivity programs and the consistent execution of recommendations to determine program viability. A report on the outcomes of the Academic Advisory Committee deliberations will be given at the Committee on Education Policy and Student Life meeting in September 2021.

Periodic Reviews (7-Year) of Academic Programs

Academic Programs Interim Reviews

New Programs 5-Year Enrollment Reviews

Academic Program Actions Delegated to the Chancellor

UNIVERSITY SYSTEM *of* MARYLAND
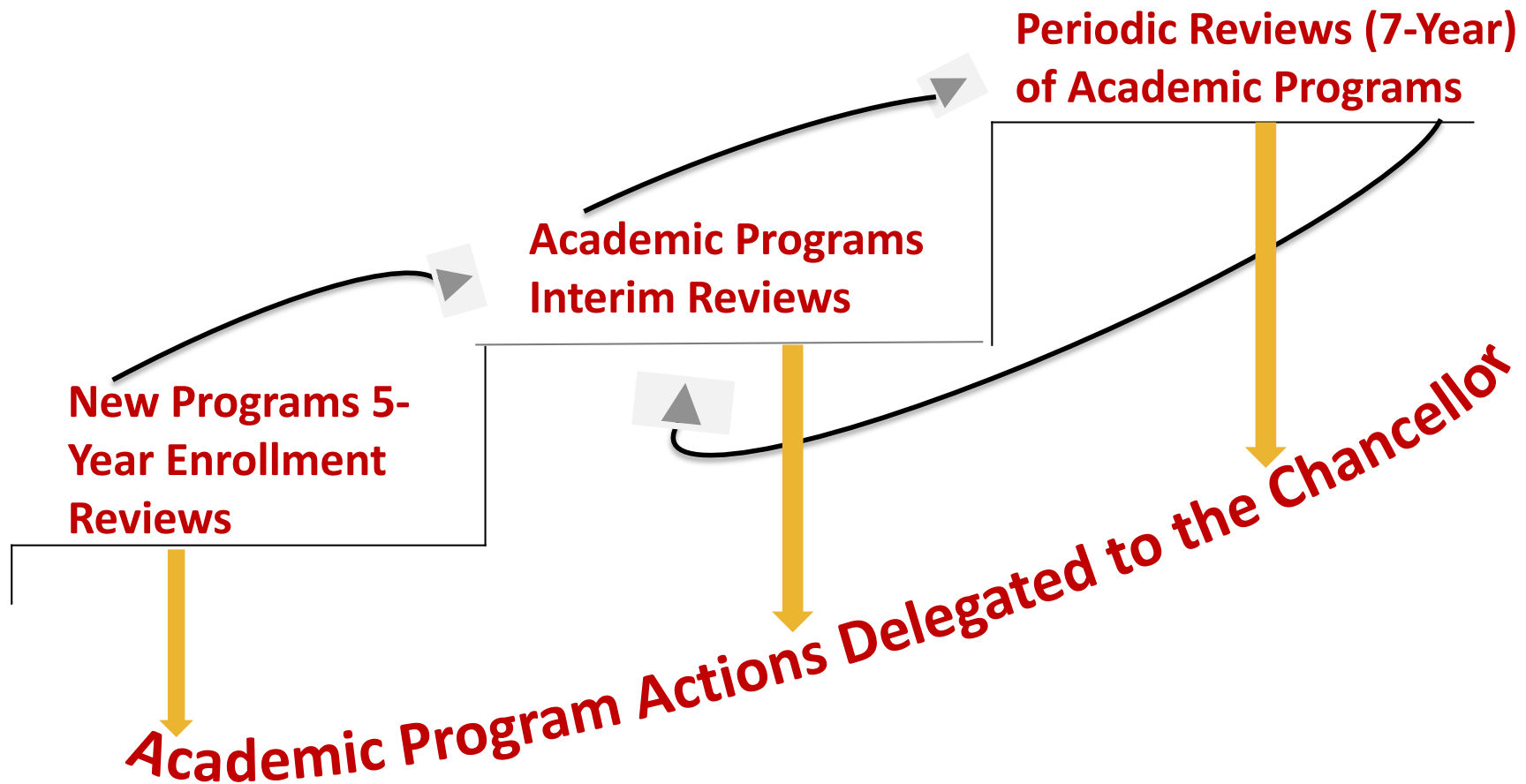
BOARD OF REGENTS
SUMMARY OF ITEM FOR ACTION,
INFORMATION, OR DISCUSSION

TOPIC: New Programs 5-Year Enrollment Reviews, Fall 2016 – Fall 2020

COMMITTEE: Education Policy and Student Life

DATE OF COMMITTEE MEETING: Friday, March 5, 2021

SUMMARY: **SUMMARY**: As part of the ongoing review process of academic programs, the attached data have been updated with the Fall 2020 enrollments of programs continuing in the five-year review period. The information will provide the Committee with the actual enrollments in new programs approved since Fall 2016. It is important to note that not all programs are implemented in the year they are approved. Dependent upon the date of the Board of Regents and MHEC approvals, recruitment and admission to the program may not begin until the next academic year. In other cases, admission to the program may not occur until the students have completed the required core courses, examinations, etc. and enrollments would then be reported two years after implementation. With those caveats in mind, the enrollment data reflect the relative accuracy for the projected enrollment submitted with the program proposal and provides an opportunity to judge the long-term viability of a new program prior to its first periodic program review.

ALTERNATIVE(S): This is an information item.

FISCAL IMPACT: This is an information item.

CHANCELLOR'S RECOMMENDATION: This is an information item.

COMMITTEE ACTION: Information Only   DATE: March 5, 2021

BOARD ACTION: DATE:

SUBMITTED BY: Joann A. Boughman   301-445-1992   jboughman@usmd.edu
              Ellen Herbst   301-445-1923   eherbst@usmd.edu

NEW PROGRAM 5-YEAR ENROLLMENT REVIEW
FALL 2016 – FALL 2020

New academic programs are reviewed annually for a period of five-years. The Fall 2016 – Fall 2020 review comprises enrollment data for fifty-eight (58) approved new academic programs. The format for the review is standardized and includes the projected and actual enrollments for each program.

The projected enrollments are derived from the program proposals approved by the Board of Regents and MHEC, and the actual enrollments are those achieved and reported each year by the programs. Attention in the review is given to the relationship between the projected and the yearly actual program enrollments.

Programs that began reviews in Fall 2016, Fall 2017, and Fall 2018 reflect actual enrollments for the third year of the programs and beyond. The most recent programs in review, Fall 2019 and Fall 2020, have varying degrees of actual enrollments as they progress through the first and second years of implementing the program.

The subsequent sections will present the number of degrees offered and the enrollment performance of the new programs.

Number of Degrees Offered in the New Programs

Degrees	No. of Degrees
Bachelors	21
Bachelors / Masters	3
Masters	29
Masters / Doctorate	1
Doctorate	4
Total	**58**

Enrollment Performance of the Programs

The enrollment performance of new programs are evaluated on whether the actual enrollment is greater than 50 percent of the projected. The following sections review the enrollment data for the programs approved during the five-year period of Fall 2016 to Fall 2020.

2

New Program Enrollment Review Fall 2016 - Fall 2020

The new programs in Table 1 reviewed during Fall 2016 to Fall 2020 achieved actual enrollments greater than 50 percent and in several years exceeded projected enrollments. As illustrated, the UMB Master of Science in Palliative Care, UMCP BS in Information Science, and UMCP MS in Business Analytics often exceeded the projected program enrollments within the first or second review years demonstrating that these programs have remained highly subscribed and are critical to addressing regional workforce demands.

The Table 1 new programs will move forward to further intervals of enrollment and program performance reviews.

Table 1

Inst.	HEGIS	Program Name	Degree Level	Approved	Enrollments									
					Fall 2016		Fall 2017		Fall 2018		Fall 2019		Fall 2020	
					Projected	Actual	Projected	Actual	Projected	Actual	Projected	Actual	Projected	Actual
UMB	120100	Palliative Care [1]	MS	6/10/16	20	0	50	61	63	119	64	108	68	116
UMCP	070101	Information Science	BS	10/6/15	50	91	100	367	150	709	200	959	200	1160
UMCP	050300	Business Analytics	MS	4/15/16	30	0	30	74	40	161	41	209	42	201
UMCP	210200	Public Policy [2]	BA	6/10/16	50	0	100	78	200	162	300	219	300	270

[1] The M.S. in Palliative Care has exceeeded its projected enrollment beginning in Fall 2017

[2] UMCP BA in Public Policy: Primary major headcount in Fall 2019 was 219, but count of all majors (including double majors) was 268

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New Program Enrollment Review Fall 2017 - Fall 2021

During the new program enrollment review period of Fall 2017 to Fall 2021, the approved programs in Table 2 are currently in the fourth year of review. The programs reflect a range of enrollment performances. Sixty-seven (67) percent of the programs in this review period exceeded and/or reflect greater than 50 percent of projected enrollments in several years. Two programs that have consistently exceeded enrollment projections are the UMGC Bachelor of Science in Homeland Security and the FSU MSN in Nurse Practitioner with a Concentration in Family Nurse Practitioner and Psychiatric and Mental Health Nurse Practitioner.

Also, the projected enrollments have been adjusted by UMB School of Law for the MS in Cybersecurity Law and MS in Homeland Security, and the UMBC BS in Translational Life Science Technology was delayed in beginning the program until Fall 2019. The programs in Table 2 will be reviewed until Fall 2021.

3

Table 2

Inst.	HEGIS	Program Name	Degree Level	Approved	Enrollments									
					Fall 2017		Fall 2018		Fall 2019		Fall 2020		Fall 2021	
					Projected	Actual	Projected	Actual	Projected	Actual	Projected	Actual	Projected	Actual
SU	020600	URBAN AND REGIONAL PLANNING	BS	9/20/16	17	7	18	15	24	20	25	20	25	
UMB	149900	CYBERSECURITY LAW [1]	MS	9/20/16	28	20	68	34	113	29	142	30	167	
UMB	149901	HOMELAND SECURITY [2]	MS	9/20/16	28	13	68	23	113	20	142	32	167	
UMCP	170300	QUANTITATIVE FINANCE	MS	1/17/17	100	148	100	142	100	130	100	90	100	
UMCP	121404	ENVIRONMENTAL HEALTH SCIENCES [3]	MS/PHD	1/17/17	15	0	15	4	15	11	15	14	15	
UMGC	050610	HOMELAND SECURITY [4]	BS	11/15/16	125	204	325	508	500	667	675	756	850	
UMGC	050629	TRANSFORMATIONAL LEADERSHIP [5]	MS	1/17/17	25	0	53	0	63	37	73	53	83	
UMBC	049901	TRANSLATIONAL LIFE SCIENCE TECHNOLOGY	BS	11/15/16	16	0	36	0	54	16	71	34	87	
FSU	120300	NURSE PRACTITIONER WITH CONCENTRATIONS IN FAMILY NURSE PRACTITIONER AND PSYCHIATRIC & MENTAL HEALTH NURSE PRACTITIONER	MSN	3/28/17	10	23	20	35	35	56	45	77	60	

Note: All enrollments are the students' primary major as reported in the MHEC EIS files. Administrative coding changes at campuses may lag actual program enrollment in initial years.

[1] The UM School of Law overestimated projected enrollment for Cybersecurity Law and anticipates Fall Class sizes to be approximately 30 students beginning Fall 2020.

[2] The UM School of Law overestimated projected enrollment for Homeland Security and Crisis Management Law and anticipates Fall Class sizes to be approximately 25 beginning Fall 2020

[3] UMCP MS/PhD in Environmental Health Sciences: Students are transitioning from Toxicology to this program. Combined enrollment was 14 in Fall 2019. The enrollment count reported in the table was based only on the count of students included in the campus's MHEC EIS with the MHEC approved HEGIS Code.

[4] UMGC Actual enrollments for Homeland Security have exceeded the projected enrollments each term.

[5] UMGC Transformational Leadership continues to exceed projected enrollment by 50%.

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New Program Enrollment Review Fall 2018 – Fall 2022

With regard to Fall 2018 to Fall 2022 seventy (70) percent of the programs in Table 3 attained in Fall 2020, during the pandemic, enrollments greater than 50 percent of the projection. And, of the programs attaining these enrollments, twenty-nine (29) percent exceeded projections. While no projected enrollments were provided for the TU MS in Transformational Educational Leadership the actual enrollment for the program almost doubled from Fall 2019 to Fall 2020.

Additionally, UMB reported the MS in Health and Social Innovation launched in 2019 with a late start. Moreover, UMGC will launch the MS in Acquisition and Contract Management in Fall 2021.

4

Table 3

Inst.	HEGIS	Program Name	Degree Level	Approved	Enrollments									
					Fall 2018		Fall 2019		Fall 2020		Fall 2021		Fall 2022	
					Projected	Actual	Projected	Actual	Projected	Actual	Projected	Actual	Projected	Actual
FSU	120101	PHYSICIAN ASSISTANT STUDIES [1]	MMS	6/22/18	0	**0**	25	**25**	25	**50**	25		25	
TU	120802	ENTRY LEVEL OCCUPATIONAL THERAPY [2]	PHD	2/9/18	0	**0**	40	**19**	40	**36**	40		40	
TU	120803	(POST-PROFESSIONAL) OCCUPATIONAL THERAPY [3]	PHD	2/9/18	25	**4**	25	**20**	25	**18**	25		25	
TU	179900	ACTURIAL SCIENCE & PREDICTIVE ANALYTICS [4]	MS	6/22/18	5	**0**	10	**5**	15	**8**	15		25	
TU	082700	TRANSFORMATIONAL EDUCATIONAL LEADERSHIP [5]	MS	6/22/18	n/a	**0**	n/a	**82**	n/a	**160**	n/a		n/a	
UMB	121411	HEALTH AND SOCIAL INNOVATION [6]	MS	12/15/17	14	**0**	20	**6**	24	**8**	24		24	
UMGC	050101	BUSINESS ADMINISTRATION [7]	PHD	6/22/18	0	**0**	55	**110**	112	**102**	168		179	
UMGC	050631	ACQUISITION AND CONTRACT MANAGEMENT [8]	MS	10/20/17	50	**0**	103	**0**	113	**0**	123		133	
UMGC	079901	CYBER OPERATIONS	MS	10/20/17	50	**0**	103	**0**	113	**58**	123		133	
UMGC	050630	STRATEGIC COMMUNICATIONS	MS	10/20/17	25	**0**	53	**0**	63	**73**	73		83	

Note: All enrollments are the students' primary major as reported in the MHEC EIS files. Administrative coding changes at campuses may lag actual program enrollment in initial years.

[1] The implementation date for the FSU Physician Assistant Studies program was Summer 2019.

[2] The TU Ph.D. in Entry Level Occupational Therapy delivery of its final courses prompted a delay to launching the program and offered time for faculty resources distribution for desired program approach.

[3] The title of the proposed program, as submitted to MHEC, was Post Professional Occupational Therapy Doctorate. MHEC's title of the program is Occupational Therapy Doctorate.

[4] The TU M.S. in Actuarial Science and Predictive Analytics requires the GRE and the pandemic challenged GRE testing for students that affected admissions, including two deferrals.

[5] No projected enrollment numbers were provided for TU's Transformational Educational Leadership program. The program is a new instructional program within existing resources.

[6] The M.S. in Health and Social Innovation launched in Fall 2019 and had a late start in marketing and recruitment.

[7] The UMGC DBA in Business Administration actual enrollments continue to exceed the projected enrollments by 50%.

[8] UMGC Acquisition and Contract Management, Cyber Operations, and Strategic Communications will launch Fall 2021.

Updated : February 2021 -- University System of Maryland Office of Institutional Research

New Program Enrollment Review Fall 2019 - Fall 2023

As illustrated in Table 4, the Fall 2019 to Fall 2023 enrollment review comprises nineteen (19) programs, the single largest review period of programs included in the Fall 2016 to Fall 2020 New Program 5-Year Enrollment Review Report. Additionally, Table 4 reflects that thirteen (13) programs enrolled students in fall 2020. As reported, the six (6) remaining programs will enroll students in fall 2021. The programs in this review period expect to meet enrollments through a series of admissions initiatives.

Furthermore, the following programs in this review cohort exceeded their project enrollments by the second year:

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1. FSU M.S. in Athletic Training
2. UMB M.S. in Medical Cannabis Science and Therapeutics
3. UMCP B.A. in Philosophy, Politics and Economics
4. UMCP M.S. in Applied Economics
5. UMCP MS in Geospatial Information Sciences

And finally, the institutions reported the following on program enrollment performance:

1. UB launched the MS in Cybersecurity Management program later than expected and has adjusted the projected enrollments to 30;
2. UMB began the B.S./M.S. in Accelerated Health Science/Area of Concentration in Physician Assistant (PA) transfer program with Anne Arundel Community College in Fall 2020 and the current enrollment in the PA program in 2019 was 78; and
3. UMCP is transitioning the enrollment from the M.P.S. to the M.S. in Geospatial Intelligence program.

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Table 4

Inst.	HEGIS	Program Name	Degree Level	Approved	Enrollments									
					Fall 2019		Fall 2020		Fall 2021		Fall 2022		Fall 2023	
					Projected	Actual	Projected	Actual	Projected	Actual	Projected	Actual	Projected	Actual
BSU	190500	Chemistry [1]	BS	6/21/19	13	**0**	25	**6**	38		50		63	
FSU	083505	Exercise and Sports Science / Athletic Training	BS / MS	2/22/19	10	*41*	10	*12*	10		10		10	
FSU	083506	Athletic Training [2]	MS	2/22/19	2	**0**	23	*0*	35		38		41	
TU	100801	Dance Education [3]	MA	6/21/19	10	**0**	20	**0**	20		20		10	
TU	100402	Music Pedagogy [4]	MM	6/21/19	3	**0**	3	**2**	4		4		5	
TU	081100	Gifted and Creative Education [5]	Med	2/22/19	10	**0**	20	**17**	30		30		30	
UB	079900	Cybersecurity Management [6]	MS	12/14/18	10	**0**	30	**2**	40		45		55	
UMB		Accelerated Health Science / Health Science with AOC in Physician Assistant [7]	BS / MS	12/14/18	73		111		76		76		76	
UMB		Clinical Dental Hygiene Leader [8]	BS / MS	12/14/18	4		10		12		12		12	
UMB	019900	Medical Cannabis Science and Therapeutics [9]	MS	6/21/19	26	**148**	37	**384**	42		21		53	
UMB	129903	Health Professions Education [10]	PhD	2/22/19	6	**0**	12	**11**	18		18		18	
UMBC	080400	Middle Grades STEM Education	BS	2/22/19	15	**0**	34	**0**	49		60		65	
UMCP	150902	Philosophy, Politics, and Economics [11]	BA	2/22/19	25	**3**	50	**56**	90		110		110	
UMCP	079900	Embedded Systems and Internet of Things [12]	BS	2/22/19	25	**0**	50	**6**	100		125		150	
UMCP	209900	Human Development [13]	BS	2/22/19	40	**0**	80	**0**	125		125		125	
UMCP	042500	Neuroscience [14]	BS	2/22/19	155	**0**	360	**94**	520		520		520	
UMCP	220401	Applied Economics [15]	MS	4/19/19	15	**2**	15	**122**	15		15		15	
UMCP	220601	Geospatial Information Sciences [16]	MS	4/19/19	40	**46**	40	**73**	40		40		40	
UMCP	220602	Geospatial Intelligence [17]	MS	4/19/19	20	**10**	26	**24**	37		45		45	

Note: All enrollments are the students' primary major as reported in the MHEC EIS files. Administrative coding changes at campuses may lag actual program enrollment in initial years.

[1] The BSU B.S. in Chemistry began in spring 2020 and is expected to meet projected enrollment.

[2] The FSU M.S. in Athletic Training first cohort will begin June 2021.

[3] The TU M.A. in Dance Education was approved by MHEC in June 2019, secured accreditor approval in Sept. 2020, and opened for admissions in November 2020 to commence in spring 2021.

[4] The TU M.M. in Music Pedagogy opened for admissions in February 2020 to commence fall 2020.

[5] The TU M.Ed. in Gifted and Creative Education opened for admissions in spring 2019 to commence in spring 2020.

[6] The UB M.S. in Cybersecurity Management launched later than anticipated because of initial program director turnover and further program developments resulting in new out-year projections of 30.

[7] UMB the BS/MS Accelerated Health Science/AOC in Physician Assistant begins in Fall of 2020 at AACC. Current enrollment in the PA program was 78 students in Fall 2019. (Without the MHEC generated

[8] UMB the BS/MS Clinical Dental Hygiene Leader program begins in Fall 2020 and is expected to meet projected enrollment.

[9] UMB the MS Medical Cannabis Science and Therapeutics program has substaintially exceeded projected enrollments and will continue to do so into the foreseeable future.

[10] UMB the PhD Health Professions Education begins in Fall 2020 and is expected to meet projected enrollment.
UMCP BA in Philosophy, Politics, and Economics: The Fall 2019 primary major count was 3, Count of all majors is 6 (includes double majors). The enrollment count reported in the table was based only on the count of students included in the

[11] campus's MHEC EIS with the MHEC approved HEGIS Code.

[12] The UMCP B.S. in Embedded Systems started fall 2020 at Shady Grove with challenging start due to COVID.

[13] The UMCP B.S. in Human Development started fall 2020 with a primary major count of 22 and overall count of 27 majors.

[14] The UMCP B.S. in Neuroscience started fall 2020 and is experiencing the continued student transition to this new program from the oversubscribed Neurobiology track and Psychology in two colleges.

[15] UMCP MS in Applied Economics: This is a transition in credential from MPS to MS. The MPS/MS combined Fall 2019 enrollment was 89 (54 at the DC location and 35 on campus). The enrollment count reported in the table was based only on the count of students included in the campus's MHEC EIS with the MHEC approved HEGIS Code.

[16] UMCP MS in Geospatial Information Sciences: This is a transition in credential from MPS to MS. The MPS/MS combined Fall 2019 enrollment was 46 as noted. The enrollment count reported

[17] UMCP MS in Geospatial Intelligence: This is a transition in credential from MPS to MS. The MPS/MS combined Fall 2019 enrollment was 18. The enrollment count reported in the table was based only on the count of students included in the campus's MHEC EIS with the MHEC approved HEGIS Code.

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New Program Enrollment Review Fall 2020 - Fall 2024

Most recently approved are the sixteen (16) programs illustrated in Table 5. The program comprising this enrollment review period were approved in AY 2019 – 2020. The majority of the programs for the Fall 2020 – Fall 2024 review period plan to enroll students in fall 2021. Two (2) programs enrolled students in year one (fall 2020). Those programs are the University of Baltimore BS in Legal Studies that exceeded its projected enrollment and Salisbury University BA in Outdoor Education Leadership with an actual enrollment greater than 50 percent of the projected.

Table 5

Inst.	HEGIS	Program Name	Degree Level	Approved	Enrollments									
					Fall 2020		Fall 2021		Fall 2022		Fall 2023		Fall 2024	
					Projected	Actual	Projected	Actual	Projected	Actual	Projected	Actual	Projected	Actual
BSU	089900	Culturally Responsive Teacher Leadership [1]	M.Ed	6/19/20	7	0	12		20		25		30	
FSU	490400	Life-Cycle Facilities Management [2]	B.S.	6/19/20	10	0	15		20		25		30	
SU	490200	Integrated Science [3]	B.S.	6/19/20	17	0	21		26		30		36	
SU	170101	Data Science	B.S.	9/20/19	17	9	21		26		30		36	
SU	082800	Outdoor Education Leadership	B.A.	9/20/19	17	13	18		24		25		30	
UB	210510	Cyber Forensics [4]	B.S.	6/19/20	21	0	25		33		37		39	
UB	149903	Legal Studies [5]	B.A.	11/22/19	9	16	16		20		25		32	
TU	083505	Athletic Training [6]	M.S.	6/19/20	10	0	25		35		40		40	
UMB		Global Health	M.S.	6/19/20	10		24		33		37		40	
UMB		Vulnerability and Violence Reduction	M.S.	6/19/20	12		15		18		21		21	
UMCP	070400	Immersive Media Design [7]	B.A./B.S.	11/22/19	55	0	110		270		320		320	
UMCP	151000	Religions of the Ancient Middle East [8]	B.A.	11/22/19	6	0	16		21		31		41	
UMCP	051100	Real Estate and the Built Environment [9]	B.A.	2/21/20	55	0	110		270		270		270	
UMCP	090500	Biocomputational Engineering [10]	B.S.	5/1/20	20	0	40		70		80		80	
UMCP	221000	International Relations [11]	M.A.	5/1/20	10	0	30		40		40		40	
UMCP	220701	Applied Political Analytics [12]	M.S.	5/1/20	10	0	25		35		45		50	

Note: All enrollments are the students' primary major as reported in the MHEC EIS files. Administrative coding changes at campuses may lag actual program enrollment in initial years.

[1] The BSU M.Ed. in Culturally Responsive Teacher Leadership will began in fall 2021 and is expected to meet projected enrollment.

[2] The FSU B.S. in Life-Cycle Facilities Management was approved by MHEC in summer 2020 with anticipated enrollment in fall 2021.

[3] The SU B.S. in Integrated Science was approved July, 2020 during pandemic making it difficult to recruit for Fall 2020 and in spring 2021 four (4) students are enrolled in the program.

[4] The UB B.S. in Cyber Forensics program was approved in summer 2020 and will launch in 2021.

[5] The UB B.A. in Legal Studies program exceeded enrollment projections.

[6] The TU M.S. in Athletic Training was approved in July 2020 and will begin accepting admission in summer 2021.

[7] The UMCP B.A./B.S. in Immersive Media Design anticipates a fall 2021 start.

[8] The UMCP B.A. in Religions of Ancient Middle East anticipates a fall 2021 start.

[9] The UMCP B.A. in Real Estate Development program is not yet started and is securing funding.

[10] The UMCP B.S. in Biocomputational Engineering anticipates a fall 2021 start at Shady Grove only.

[11] The UMCP M.A. in International Relations: program is operating as a "4+1" BA/MA program only. Students admitted in Fall 2020 are in the 4th year of BA thus not counted yet in the MA program.

[12] The UMCP M.S. in Applied Political Analytics anticipates fall 2021 start for 1st cohort of MS students. Program intended to be both stand-alone MS program and "4+1" BS/MS program.

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SUMMARY

The Fall 2016 to Fall 2020 New Program 5-Year Enrollment Review Report indicates that the majority of the programs are achieving actual enrollments greater than 50 percent of their projected enrollments. And, for some program the actual enrollments exceeded the projected. The programs in Table 1 representing review period Fall 2016 – Fall 2020 are concluding the new program 5-year enrollment review with solid enrollments to address the workforce demands in these fields.

In addition, the programs in Tables 2 and 3 have a range of enrollment achievements with the majority demonstrating greater than 50 percent of their projected enrollment. And, it is important to note that Tables 4 and 5 illustrate the most recently approved programs. Several of these programs achieved enrollments that exceeded projection or with actual enrollments greater than 50 percent of the first or second year projections. Finally, the other programs in Tables 4 and 5 will enroll students in fall 2021, especially the pipeline programs with demonstrated pathways for students from community college to graduates programs, i.e. UMB B.S./M.S. Accelerated Health Science / AOC in Physician Assistant – community college to B.S. to M.S., UMCP M.S. in Applied Political Analytics 4+1 B.S./M.S, UMCP M.A. in International Relations 4+1 B.S./M.S.; etc.

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UNIVERSITY SYSTEM *of* MARYLAND

TOPIC: William E. Kirwan Center for Academic Innovation Update

COMMITTEE: Education Policy and Student Life

DATE OF COMMITTEE MEETING: Friday, March 5, 2021

SUMMARY: The USM's William E. Kirwan Center for Academic Innovation was established in June 2013 to enhance and promote the System's position as a national leader in higher education academic innovation. The Center's charge is to capitalize on recent findings from the learning sciences and the capabilities of emerging technologies to increase access, affordability, and outcomes of higher education. We are bringing together academic change leaders from across the System to identify ways we might improve the success of students, evaluate the feasibility of these approaches, share our findings, and scale-up and sustain promising models.

Working at the System level has been vital to the impact that the Center has had to date. Our position allows us to leverage the collective strengths of our diverse institutions, which are working together to support innovation across the USM. From this vantage point we have been able to:

1. Create a collaborative environment to support innovation both among the USM institutions and across the State of Maryland;

2. Incubate initiatives aimed at catalyzing change;

3. Remove barriers that block progress; and

4. Lead the national conversation on academic transformation.

Dr. MJ Bishop, Director of the Kirwan Center and Associate Vice Chancellor, will share an update on the Center's progress since her last report.

ALTERNATIVE(**S**): This is an information item.

FISCAL IMPACT: This is an information item.

CHANCELLOR'S RECOMMENDATION: This is an information item.

COMMITTEE ACTION: Information Only	DATE: March 5, 2021
BOARD ACTION:	DATE:
SUBMITTED BY: Joann A. Boughman 301-445-1992	jboughman@usmd.edu

UNIVERSITY SYSTEM
of **MARYLAND**

TOPIC: P-20 Update

COMMITTEE: Education Policy and Student Life

DATE OF COMMITTEE MEETING: Friday, March 5, 2021

SUMMARY: The P–20 work in the Office of Academic and Student Affairs encompasses partnerships between USM and USM institutions; the Maryland State Department of Education and the Maryland Higher Education Commission; the Maryland community colleges and independent colleges and universities; and the Maryland Public Schools. The USM P–20 Office serves as a central point of contact for the education segments—P–12 schools, community colleges, and universities—to collaborate on shared objectives of breaking down barriers and building seamless educational experiences for all students from kindergarten through college and career.

P-20 at USM works to close gaps in opportunity and achievement for all students, but especially students of color and low-income students who have been traditionally under-represented in higher education. Our role is to support our institutions in their work of preparing the next generation of teachers for Maryland schools, reducing remediation in college, bridging the digital divide, and preparing all students for to be informed and engaged citizens who will sustain our democracy.

COVID-19 necessitated that the work of the P–20 Office adapt and "pivot," and this report addresses how we adapted and what we have learned over the past year.

P–20 initiatives are reflected in the attached materials:
- Improving P-20 mathematics education
- Expanding access to computer science for all Maryland K–12 students: Maryland Center for Computing Education
- Meeting the Democracy Challenge of 2020 and beyond
- Teaching and learning in a time of COVID

In addition to the P-20 System-level work, this report includes two updates:
- Blueprint for Maryland's Future: legislation implementing recommendations Commission on Innovation and Excellence in Education—Kirwan Commission
- B-Power: Transfer of B-Power to University of Baltimore

ALTERNATIVE(S): This is an information item.

FISCAL IMPACT: This is an information item.

CHANCELLOR'S RECOMMENDATION: This is an information item.

COMMITTEE ACTION: Information Only	DATE: March 5, 2021
BOARD ACTION:	DATE:
SUBMITTED BY: Joann A. Boughman 301-445-1992	jboughman@usmd.edu

P–20 Annual Report

Education Policy and Student Life Committee

University System of Maryland Board of Regents

March 5, 2021

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- B-Power: Transfer of B-Power to University of Baltimore

Improving P–20 Mathematics Education

<u>Maryland Mathematics Reform Initiative: First in the World (MMRI–FITW)</u>

USM received a four-year, three-million-dollar grant from the U.S. Department of Education in 2015. The grant directly addressed the problem of too many undergraduate students placing into non-credit, developmental (also known as remedial) mathematics courses. In collaboration with seven community colleges and five USM institutions, USM supported the development of high-quality statistics pathways that accelerate students' progress through their general education required mathematics courses.

Impact Evaluation

The grant ended September 30, 2020 and we have received the final report from our evaluator, Westat. The evaluation compared students in the traditional algebra-based developmental course (comparison group) with students in the new, statistics-based developmental course (treatment group). Evaluators created a matched sample of students, according to baseline math ability and Pell eligibility, and standard demographics of race, sex, and age, resulting in a pool of 748 students in the treatment group and 1,293 in the comparison group. The results of the rigorous quasi-experimental study demonstrated the clear success of the our hypothesis that offering non-STEM students an alternative statistics pathway led to increased student success, retention and completion.

(1) The evaluation found that a significantly larger proportion of students in the treatment group (statistics) than in the comparison group (algebra) passed developmental math.

Figure 1. Students Passing Developmental Math

155
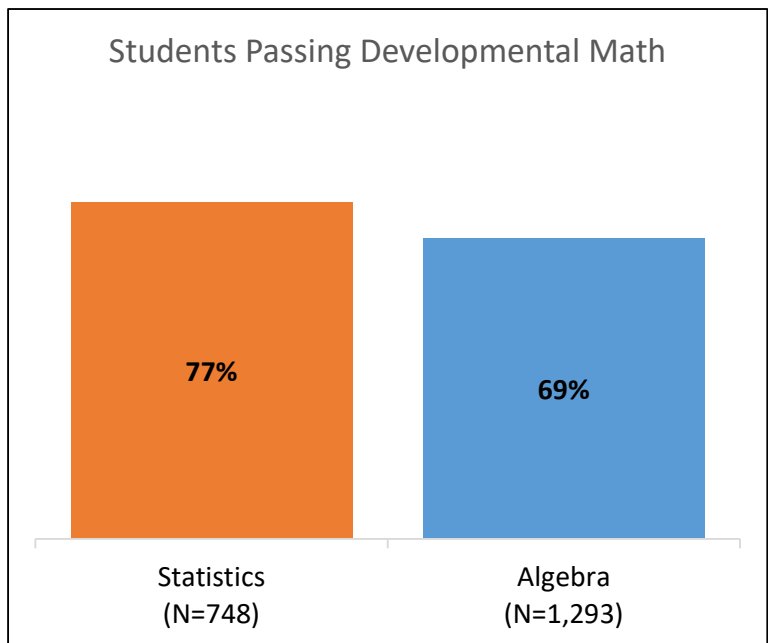
(2) Students in statistics-based developmental courses required fewer attempts to pass than students in the algebra-based developmental course.

*Figure 2. Pass Rates After 1 Attempt and in First Semester of Study*
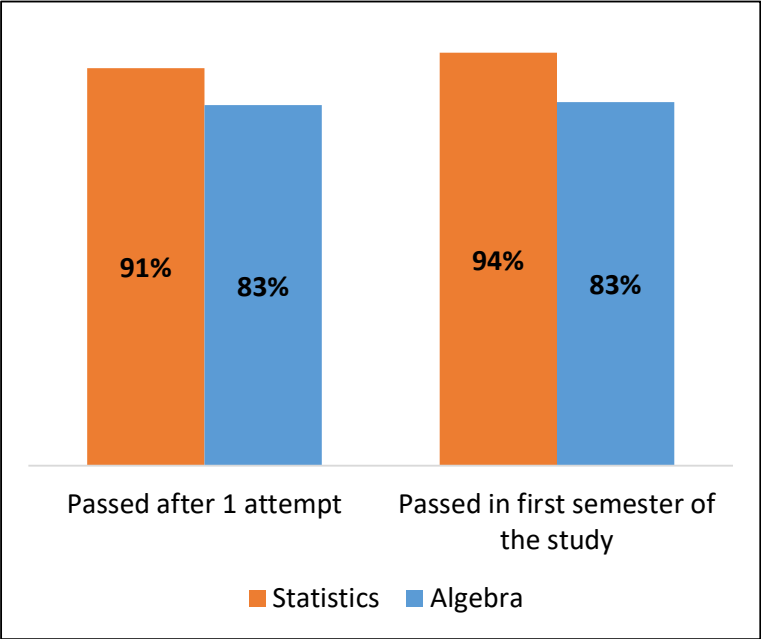
(3) A significantly higher percentage of students from the statistics-based pathway enrolled in credit-bearing math.

Figure 3. Students Enrolling in Credit-Bearing Math
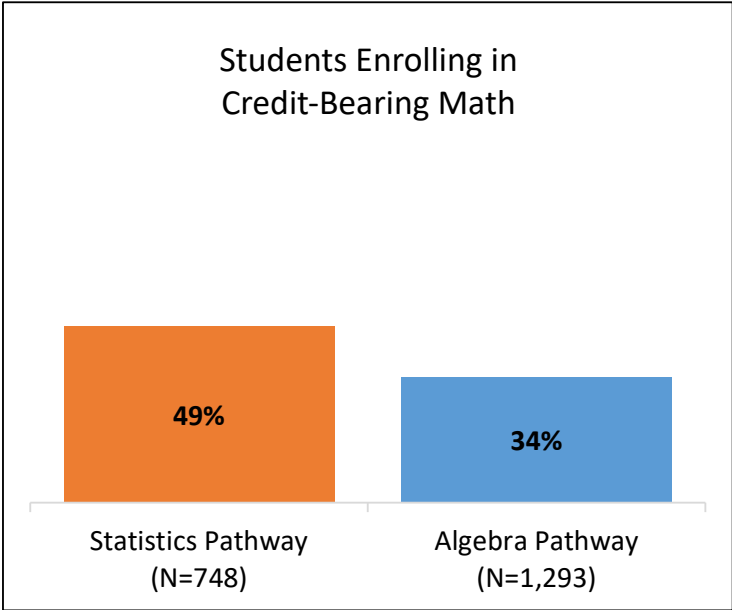
(4) Once they passed their developmental course and enrolled in credit-bearing math, students from the statistics pathway and the algebra pathway performed equally well. There were no significant differences in passing rates between the groups of students. This demonstrates that students were equally well-prepared for college-level math, regardless of the developmental math course they had taken.

Figure 4. Students Passing Credit-Bearing Math
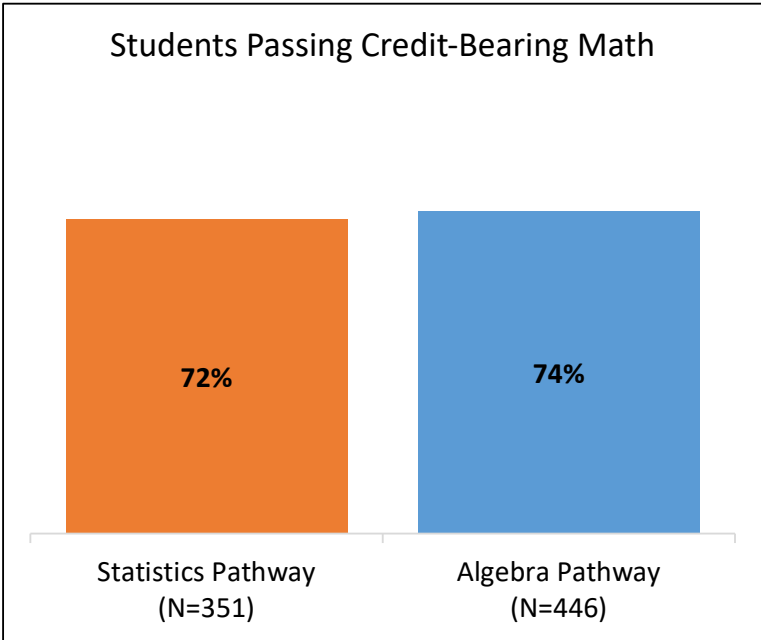
Importantly, success rates in the new pathways courses were *not* significantly different for different demographic groups:

- Female-identified and male-identified students were both more likely to pass the statistics pathways course than the traditional, algebra-based course.

Nationwide, white students have higher pass rates in developmental courses than students of color. That trend did not hold true in the new, statistics pathways developmental courses:

- Students of color were as likely to be successful in the new statistics course as white students.
- Pell grant-eligible students were as likely to be successful in the new courses as non-eligible students.

Attachment: "[Effectiveness of a System-Level Initiative to Create Developmental Math Pathways That Help Students Succeed](#)" (Feldman et al., 2020)

Cost-Effectiveness Study

Additional research analyzed the cost-effectiveness of the new pathways courses, looking at both the cost to students and the cost to institutions. The researcher found that

(1) participating in the MMRI–FITW reduced costs for students by approximately 7%.

(2) the statistics pathway was approximately 36% more cost-effective than the traditional, algebra-based pathway at the institution level. That is, the statistics option moved students from developmental to credit-bearing math at two-thirds the cost of the algebra-based pathway.

Attachment: "[The Cost-Effectiveness of an Alternative Approach to Developmental Education](#)" (Finster & Feldman, 2020)

[*MMRI website*](#)

USM created a [website](#), to serve as living archive of presentations, publications, and other resources related to the federal grant, MMRI–FITW.

COVID-19 Pivot: Maryland Placement Policies Community of Practice (MPPCP)

Because COVID pandemic restrictions prohibited USM from hosting conferences, workshops and in-person faculty development activities beginning in March 2020, we redirected the federal grant-funding from FITW to issues that had arisen as challenges during the four-year implementation of grant priorities.

Placement topped the list of challenges for both two-year and four-year institutions. Students enrolling in college for the first time are often placed into math (and English) courses according to scores on standardized tests. However, after examination of the data, we found such tests were not always accurate. Some students were placed several levels below credit-bearing coursework

even though they could be successful in a more challenging course. In addition, the current algebra-focused placement tests are not appropriate for placing students into statistics pathways, so students were being disadvantaged.

In July of 2020 USM organized a virtual workshop to bring together administrators and faculty members across Maryland two-year and four-year institutions, including seven USM institutions. The workshop featured researchers and other leaders involved in placement reform initiatives presenting the latest research on effective placement policies and practices. Although MMRI-FITW focused on mathematics reform, the Placement Community included institutional representatives focused on reading placement, as well.

Participating faculty created action plans designed to explore the use of other placement policies and practices, such as using multiple measures (rather than relying on a single test score) tailored to their specific institutional context. USM invited institutions to apply for seed funding from FITW to support campus-level workgroups to address multiple measures for placement. Seven USM institutions participate in this community: BSU CSU, FSU, TU, UB, UMBC, UMES, along with five community colleges.

Maryland Mathematics Alignment Project (MMAP) and Maryland High School Graduation Requirements

Last year the Maryland State Department of Education (MSDE) invited USM to co-lead an effort to build a more seamless alignment between high school mathematics requirements for a Maryland diploma and college mathematics requirements for an AA or bachelor's degree (attachment). This work builds on the work of the FITW/MMRI (Maryland Mathematics Reform Initiative) to expand the high school mathematics options to include statistics and data science.

This year the Maryland State Board of Education passed new graduation requirements that include requiring a fourth year of mathematics. USM participated in the task force that developed the recommendations for the new mathematics requirements. The four-year math requirement, together with the work on expanding math options in high school are intended to build seamless P-20 alignment, reduce remediation, and increase student success in college.

Expanding access to computer science for all Maryland K–12 students:

The Maryland Center for Computing Education

The Maryland Center for Computing Education (MCCE) was formally established in statute and funded with the enactment of *Securing the Future: Computer Science Education for All* on July 1, 2018. MCCE obtained a total of seven million dollars in state funds to assist each of the Maryland Public Local School Systems (LSS) and the Institutions of Higher Education to strengthen the computing knowledge and skills of the teaching workforce in Maryland. The MCCE has 15-year goals to increase computing education in all the Maryland K-12 public schools. (See page 10 of the MCCE's 2018-2019 Annual Report). Since 2018, each LSS began the process of creating an equitable computing education vision across K-12 and set short and long-term goals to provide computer science for all students.

Professional Development

MCCE continuously provides resources, support, grant funding, and professional development to support LSS plans. As computing and technological advances occur, MCCE adapts support by providing new topics, such as cybersecurity and artificial intelligence, across the state including best practices and tools for teaching online.

- There have been over 1,052 Maryland K-12 teachers who attended MCCE-funded professional development through over 100 workshops and webinars.

To ensure sustainable and scalable computing programs, MCCE supported 41 teachers who earned CS certification. Teachers across the state have also become mentors and local computing education experts, enabling them to teach more underserved populations. In fact, MCCE has also provided professional development for teachers from the Schools for the Deaf and Blind and the Juvenile Services Education System.

In addition to K-12 support, MCCE provided funds to 14 public and private Maryland universities and colleges to infuse computing education into pre-service teacher education programs. As shown in the MCCE's 2019-2020 Annual Report, these projects provide long-term solutions to ensure that our pre-service teachers graduate with meaningful computing education learning experiences, including how to create computing infused lessons.

*High Quality CS Courses for Public High School Students*

The grassroots efforts to increase the number of high-quality CS courses began prior to MCCE and has continued to increase. Recently, MCCE and the Maryland Longitudinal Data System Center (MLDS) collaborated on a research project to create public dashboards to monitor computing education progress in Maryland. By the 2018-2019 school year, 80% of the diploma granting public high schools had at least one high quality CS course with student enrollment. (See figure 5.) There were 22 different types of CS courses and 10% (26,760) of the students were enrolled in a high-quality CS course during the 2018-2019 school year.

Figure 5. The Maryland state trend (2013-2019) in the percentage of high schools offering at least one high quality CS course
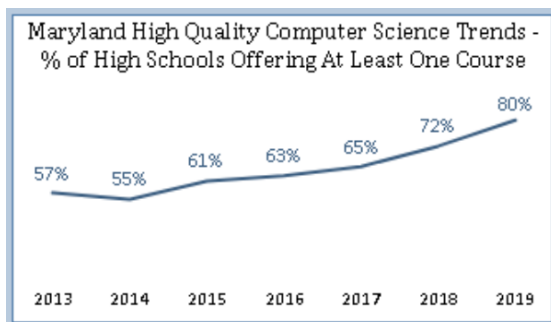
Students have a variety of pathways to consider when graduating high school. Of the 2018 Maryland public high school graduates who took at least one high quality CS course in high school, there were 66% (5,557) who opted to attend college, and of these graduates, 75% (4,155) attended a four-year university or college. (See figure 6). There were 25% (1,049) of students attending the 4-year institutions who majored in a CS related major. MCCE will continue to monitor the data and update the dashboards annually.

Figure 6. The 2018 Maryland public high school graduates who took at least one high quality CS course post-graduation outcomes
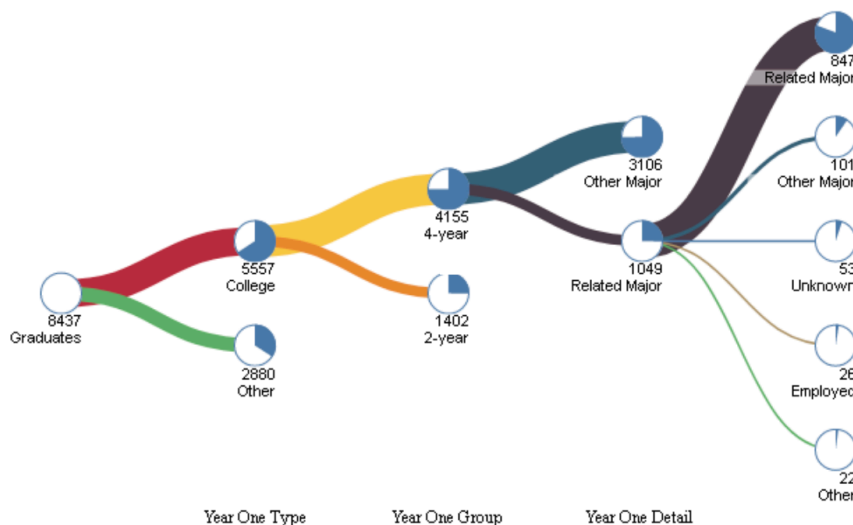
COVID-19 Pivot: Just-in-time workshops for Maryland teachers on using online platforms

During the shift to remote learning, MCCE provided professional development for over 340 educators across the state including best practices and tools for teaching online. Those who participated in the workshops are teacher-leaders in school districts across the state and serve as resources for their buildings and their districts.

- MCCE offered 11 different types of online webinars during a total of 23 sessions to prepare and support teachers.
- Webinars, such as Fool Proof Strategies for Distance Learning, were designed to increase teachers' confidence about teaching remotely. Teachers obtained fully differentiated lesson plans to implement in their virtual classrooms.
- Just-in-Time webinars for 4 courses focused on setting up the virtual classroom, gaining access to all the online materials, and reviewing the first unit of each course.

Civic Education and Civic Engagement

Meeting the Democracy Challenge of 2020 and Beyond

USM has had a proactive Civic Education and Civic Engagement Initiative since 2017, when the EPSL charged a task force to make recommendations on civic education, civic engagement, and civic responsibility. EPSL receives regular reports on Civic Engagement initiatives (last report was November 2020). USM Regents identified Carnegie Community Engagement Classification as a priority for USM institutions. The application process is lengthy (5-year window) and rigorous. To date, three USM institutions have earned that recognition: Salisbury University, Towson University and UMBC.

COVID-19 Pivot: 2020 Election Activity

In Fall 2020 Chancellor Perman received urgent notification from Governor Hogan and Maryland Secretary of Higher Education James Fielder that the state had an emerging crisis due to COVID-19 quarantine requirements and needed to recruit college students to replace seniors as election judges and non-partisan poll workers, we already had a networked foundation across all our institutions.

A call went out to Presidents and Vice Presidents of all the USM institutions (including the regional centers) for a single point of contact for communication to the campus, and a request for nominations of students to become part of an active "Student Civic Leadership Committee, and we started a weekly news update and central webpage to disseminate up-to-the minute information on voter registration and election judge and poll worker information.

USM recruited 29 students from all USM institutions and our regional centers, including two student regents to serve as a System-level Student Civic Leadership coordinating committee, and coordinated with the USM Student Council, which represents 172,000 students across the USM. The President and Vice President of the Student Council serve on the Civic Leadership coordinating committee.

USM Presidents named senior leaders as "points of contact" for recruiting election judges, and which met regularly during fall 2020. Throughout the fall we encouraged friendly competition to spread good ideas about how to engage the most students and faculty. USM Communications Office sent out a weekly e-newsletters which had links to registration and election-judge information, reaching hundreds of students, faculty, regents, with an average of a 50% "open" rate. In September 2020 USM launched a *USMVotes Webpage* which included essential election information and links to every campus and regional center voter/election webpage.

 USM hosted a student-targeted webinar for *Maryland State Board of Elections* addressing important COVID-related changes to the electoral process, including registration and voting requirements for students.

USM participates in the National Study of Learning, Voting, and Engagement and expects a final report on the 2020 election participation in September 2021.

COVID-19 Pivot: Civic Engagement Statistics Modules

Because the COVID pandemic prevented USM from hosting the end-of-grant convenings and workshops during the summer of 2020, USM directed last dollars from the *U. S. Department of Education First in the World* (FITW) grant to a competitive grant opportunity for mathematics faculty from public two-year and four-year colleges and universities. The grant provided summer stipends to mathematics faculty to collaborate with faculty from different disciplines to create statistics instruction lessons in the form of online modules that would integrate public policy and social science topics into statistics courses. USM funded 12 collaborative projects, including (5) USM institutions: CSU, FSU, UB, UMES, UMGC.

Institution	Title / Topic
Coppin State University	Using public health related datasets to understand disproportionate impacts in Baltimore and across Maryland
Frostburg State University	*Build-a-Bag: Bringing the Food Insecurity Crisis into the Statistics Classroom Through Information Literacy and Civic Engagement*
University of Baltimore	*Stats Literacy is Information Literacy: Becoming a Critical Media Consumer and Engaged Citizen*
University of Maryland Eastern Shore	Teaming students with local organizations to apply statistical concepts to real-world issues
University of Maryland Global Campus	Teaching data literacy and statistical content with real-world datasets

Teacher Preparation

USM's VCASA P–20 Office hosts two state-wide affinity groups: the Maryland Education Deans Council and the Associate of Arts of Teaching Oversight Council.

Maryland continues to face a teacher shortage that crosses all counties and subject areas. USM is the state's largest producer of teachers (+70% annually), but Maryland is still a net-importer of teachers. The quantity and quality of the Maryland teacher pipeline is a key predictor of student success in college and career. COVID-19 has only exacerbated the challenges of supplying all Maryland schools with highly qualified teachers. Challenges include

- recruiting diverse candidates into teaching,
- preparing candidates to be effective educators, particularly in shortage areas like STEM and special education,
- distributing teachers equitably across all schools,
- providing new teachers with induction support and ongoing professional development, and
- retaining them in the profession over time.

While the Blueprint for Maryland's Future addresses some of these thorny issues, a great deal of collaboration and commitment will be needed to make measurable progress.

COVID-19 Pivot: Education Deans Council

The Education Deans Council includes all Education Deans from the University System of Maryland, the Maryland Independent College and University Association (MICUA), Morgan State University and St. Mary's College of Maryland. This year, The Ed Deans Council has been consumed with responding to the COVID-19 pandemic-related disruptions.

Internships

The closing of schools in March 2020 upended the USM colleges of education by creating an emergency for the teacher candidates who were in the process of completing their student teaching internships. In Spring 2020 USM colleges of education negotiated with local school districts to find ways their students could complete the required internship hours when schools abruptly closed their buildings. Fall 2020 was more organized, as all schools and universities were virtual. Spring 2021 is currently under negotiation, since not all school districts are opening under the same guidelines. USM institutions will need to provide case-by-case advising to students about in-person internships. As a result, USM teacher preparation programs are planning extended support for students.

Background Checks and fingerprinting

COVID made it difficult for students to physically travel to each jurisdiction for required criminal background checks and fingerprinting. USM led the Ed Deans Council in negotiations to streamline that process.

Recruitment and Enrollment

All teacher education programs are experiencing challenges in recruiting teacher candidates. USM contributed a number of recommendations through a JCR request, Report on Postsecondary Strategies on the Blueprint for Maryland's Future (R75T0001). These recommendations included:

- Fully fund paid clinical internships for qualified teacher candidate(s) to increase diversity, create a state-wide background check/fingerprint database accessible to all local school systems, and the development and expansion of programs and models to increase the number of Maryland trained teachers.

- Provide financial support for students to pay for the portfolio-based performance assessment required for licensure, and licensure exams (TRE, Content Tests, etc.), fingerprinting, and other costs related to licensure. Estimating 2000 candidates to need approximately $1000 each for supplemental expenses, for a total of $2,000,000 per year.

- Continue to support masters' and other graduate degrees as part of teacher compensation on the career ladder and to support the continued professionalism of teaching.

- Establish three-year comprehensive induction programs that reduce teacher class time during the first and second years and ensure new teachers have trained compensated mentors during their induction.

- Institutions of Higher Education (IHEs) have a responsibility to be engaged in the induction years for their graduates and should be funded to do so including the ability to collect data on their performance, including for accreditation purposes. Funding at the level of one professional staff person per institution would be appropriate, approximately $100,000 (salary and benefits) for 23 teacher preparation institutions for a total of $2,300,000 base budget.

- Involve higher education in training mentors through funded mentor academies. Funding for a mentor academy director and programming per institution would be appropriate, approximately $75,000 (salary and benefits) and programming costs at $25,000 annually for a total of $2,300,000 per year base budget.

- Incorporate innovative teacher leadership programs, such as the Ed.D. at University of Maryland College Park, that are supported by school districts.

- Support development of a statewide professional network to ensure retention of diverse teachers. This network should provide mentorship, professional development, and collaborative opportunities. Network platform design, content development, custom branding, training and support ($345,000 one-time cost). Annual maintenance fee of $25 per user for approximately 20,000 teachers for a total of $500,000 per year.

- Expand the Maryland Teaching Fellows program to include all students enrolled in undergraduate and graduate educator preparation programs. The Maryland Teaching

Fellows provided 100% tuition, mandatory fees, and room and board for a resident undergraduate student or graduate student. Estimating teacher candidates at 2000 per year, we recommend increasing the MHEC Teaching Fellows fund to $20,000,000 per year.

- State scholarships and loan repayment funds for teacher candidates need to be publicized and made more transparent to both students and institutions. Application review and distribution of awards needs to have a seamless process and consider the tuition billing cycles of higher education.

- Increase and sustain the innovation grants (Teacher Collaboratives). Currently these grants are funded at $2,500,000 for two years. We recommend the grants be increased to $5,000,000 and be extended for a total of 10 years, through 2030.

- Carefully monitor the Teacher Quality and Diversity Program to ensure the funds are used to recruit and support teacher candidates from under-represented groups and build dual enrollment programs with diverse high schools that provide a direct pipeline of teacher candidates.

COVID-19 Pivot: AAT Oversight Council and Transfers to Colleges of Education

With the closing of the public schools in March, all USM institutions agreed to accept any AAT student whose program completion was verified by their institution, and not require any additional evidence that students had completed the required licensure tests. MHEC published this agreement on their website: COVID-19 AAT Statewide Agreement

The teacher education departments and programs at the 4-year colleges and universities identified below have agreed to defer the requirement for AAT students to pass Praxis I, if the students have met all the other requirements for admission, and all requirements for an AAT degree, as established by the State Superintendent of Schools and the State Board of Education. Students who have been admitted to a teacher education program at a four-year university or college should follow the guidance below. (Covid AAT Agreement).

COVID Pivot: Responding to challenges

USM's teacher education programs (in collaboration with state, local school district, and community college partners) are continually redesigning and innovating teacher preparation programs. While the COVID 19 pandemic presented many challenges, our institutions responded with various solutions:

- Professional development for Maryland teachers to be able access and teach on different virtual platforms,

- Redesigned clinical experiences for teacher candidates,

- Provided training and support to help faculty transform existing in-person university courses into virtual platforms.

<u>Ongoing P–20 Teaching and Learning Priorities</u>

Financial Literacy

This year, USM is collaborating with the Maryland Council on Economic Education (MCEE) to ensure that Maryland's teachers are prepared to teach the financial literacy standards in the K-12 schools. Financial literacy learning outcomes are important across the P-20 continuum and include the economic knowledge, decision-making skills students need to make informed, rational decisions as consumers, workers, citizens, savers, investors and participants in the global economy. MCEE designs workshops and curriculum modules aimed at meeting the needs of teacher candidates in our nine USM teacher preparation programs. In addition, the COVID-19 pandemic has created the opportunity for the collaborative to create innovative approaches to virtual workshops. For more information on the resources and experiences, visit the [MCEE resources](https://www.econed.org) (https://www.econed.org) .

Teaching Mathematics

The Maryland AAT Oversight Council charged a committee to review the outcomes associated with the Early Childhood and Elementary AAT degree programs and make recommendations for changes or updates to those programs. Significant updates have been made to the mathematics required for elementary teachers to ensure alignment of courses with common core standards and the integration of computational thinking into revised course frameworks. For more information about the Mathematics Community of Practice, visit the website: https://sites.google.com/view/developingelementarymathematic/home

Updates on P–20 Topics

Commission on Excellence and Education in Education (Kirwan Commission)/Blueprint for Maryland's Future

During the 2020 Session, the General Assembly passed the Blueprint for Maryland's Future (SB1000/HB1300) which encompassed the recommendations of the Commission on Innovation and Excellence in Education (Kirwan Commission). Governor Hogan vetoed the bill after the Session concluded in May of 2020. The General Assembly voted to override the veto in February 2021. The bill goes into effect 30 days after the override, but the Governor is not mandated to begin funding Kirwan until fiscal year 2023 which begins July 1, 2022. There is supposed to be a companion bill introduced during this Session to make additional tweaks because of the one-year delay, but that bill is still in the works.

B-Power

B-Power is a dual enrollment program in Baltimore City that began as a USM initiative in 2016. Over the past three years, the program has expanded to include almost every eligible public high school in Baltimore. John Brenner, Director of Early College Initiatives at UB, has led this work from the beginning.

This year, base-budget funding for the B-Power program was transferred to University of Baltimore. In response to the COVID-19 pandemic more schools requested dual enrollment for Spring 2020 than ever before. B-Power, in collaboration with MCCE, ensured that all students enrolled in the dual enrollment courses had access to computers and internet.

Student headcount grew from 245 in 2018-2019 to 295 in 2019-2020; these students were in 24 cohorts from 23 different high schools.

The current Academic Year (Fall 2020-Spring 2021) has seen another 10% growth in headcount to 320 students, along with an increase in the number of dual enrollment cohorts to 29 from 25 different schools. UB began offering Introduction to Psychology more widely, along with Calculus at select schools. UB plans to begin offering a Dual Enrollment Computer Science course in Fall 2021